Size: 1.0in x 1.0in x 0.39in (25.4mm x 25.4mm x 9.9mm)

OPTIONS

- Negative Logic Remote On/Off
- Without Trim
- On/Off Pin
- Input Ranges
- Output Voltages

FEATURES

- Six-Sided Shielding
- High Efficiency up to 91%
- 2:1 Wide Input Voltage Range
- 1600VDC Isolation Voltage
- Compliant to RoHS & Reach
- CE Marked
- Useful in a variety of applications
- Small Size and Low Profile: 1.0” x 1.0” x 0.39”
- No Minimum Load Required
- Over Voltage, Over Current, and Short Circuit Protection
- Under Voltage Protection
- IEC/EN/UL62368-1
- Positive/Negative Logic Remote On/Off, Without Trim, Without On/Off Pin options

APPLICATIONS

- Measurement
- Telecom/Datacom
- Industry Control Systems
- Automation
- IPC

DESCRIPTION

The JFC series of single and dual output DC/DC converters provide up to 15 watts of output power in an industry standard package and footprint. These units are specifically designed to meet power needs in a low profile package. All models feature a 2:1 wide input voltage range of 9~18VDC, 18~36VDC, or 36~75VDC. Some features include positive or negative remote on/off, 1600VDC I/O isolation, and no minimum load requirements. All models are protected against over current, input under voltage, over voltage, and short circuit conditions.

MODEL SELECTION TABLE

Single Output Models

Model Number	Input Voltage Range	Output Voltage	Output Current	Ripple & Noise	No Load Input Current	Output Power	Maximum Capacitive Load	Efficiency
JFC12S3.3-4000	12VDC (9~18VDC)	3.3VDC	4000mA	75mVp-p	120mA	Up to 15W	12000µF	84%
JFC12S5-3000		5VDC	3000mA	75mVp-p	90mA		6000µF	88%
JFC12S12-1300		12VDC	1300mA	100mVp-p	30mA		1000µF	86%
JFC12S15-1000		15VDC	1000mA	100mVp-p	30mA		660µF	88%
JFC12S24-625		24VDC	625mA	100mVp-p	12mA		200µF	90%
JFC24S3.3-4000	24VDC (18~36VDC)	3.3VDC	4000mA	75mVp-p	50mA	Up to 15W	12000µF	86%
JFC24S5-3000		5VDC	3000mA	75mVp-p	65mA		6000µF	88%
JFC24S12-1300		12VDC	1300mA	100mVp-p	20mA		1000µF	87%
JFC24S15-1000		15VDC	1000mA	100mVp-p	20mA		660µF	88%
JFC24S24-625		24VDC	625mA	100mVp-p	10mA		200µF	90%
JFC48S3.3-4000	48VDC (36~75VDC)	3.3VDC	4000mA	75mVp-p	25mA	Up to 15W	12000µF	86%
JFC48S5-3000		5VDC	3000mA	75mVp-p	35mA		6000µF	88%
JFC48S12-1300		12VDC	1300mA	100mVp-p	12mA		1000µF	88%
JFC48S15-1000		15VDC	1000mA	100mVp-p	12mA		660µF	88%
JFC48S24-625		24VDC	625mA	100mVp-p	10mA		200µF	91%

MODEL SELECTION TABLE

Dual Output Models

Model Number	Input Voltage Range	Output Voltage	Output Current	Ripple & Noise	No Load Input Current	Output Power	Maximum Capacitive Load	Efficiency
JFC12D5-1500	12VDC (9~18VDC)	±5VDC	±1500mA	100mVp-p	30mA	Up to 15W	±3000µF	85%
JFC12D12-625		±12VDC	±625mA	100mVp-p	30mA		±520µF	87%
JFC12D15-500		±15VDC	±500mA	100mVp-p	30mA		±330µF	88%
JFC12D24-315		±24VDC	±315mA	100mVp-p	17mA		±100µF	90%
JFC24D5-1500	24VDC (18~36)	±5VDC	±1500mA	100mVp-p	15mA	Up to 15W	±3000µF	85%
JFC24D12-625		±12VDC	±625mA	100mVp-p	15mA		±520µF	88%
JFC24D15-500		±15VDC	±500mA	100mVp-p	25mA		±330µF	88%
JFC24D24-315		±24VDC	±315mA	100mVp-p	12mA		±100µF	90%
JFC48D5-1500	48VDC (36~75VDC)	±5VDC	±1500mA	100mVp-p	12mA	Up to 15W	±3000µF	85%
JFC48D12-625		±12VDC	±625mA	100mVp-p	15mA		±520µF	89%
JFC48D15-500		±15VDC	±500mA	100mVp-p	20mA		±330µF	88%
JFC48D24-315		±24VDC	±315mA	100mVp-p	10ma		±100µF	91%

SPECIFICATIONS

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS			Min	Typ	Max	Unit
INPUT SPECIFICATIONS							
Operating Input Voltage Range	12Vin(nom)			9	12	18	VDC
	24Vin(nom)			18	24	36	
	48Vin(nom)			36	48	75	
Start-Up Voltage	12Vin(nom)					9	VDC
	24Vin(nom)					18	
	48Vin(nom)					36	
Shutdown Voltage	12Vin(nom)			7	8	8.8	VDC
	24Vin(nom)			14.5	15.5	17.5	
	48Vin(nom)			32	33.5	35	
Input Surge Voltage	100ms, max.		12Vin(nom)			36	VDc
			24Vin(nom)			50	
			48Vin(nom)			100	
Input Filter				Pi Type			
OUTPUT SPECIFICATIONS							
Output Voltage				See Table			
Voltage Accuracy				-1.0		+1.0	%
Line Regulation	Low Line to High Line at Full Load	Single		-0.2		+0.2	%
		Dual		-0.5		+0.5	
Load Regulation	No Load to Full Load	Single		-0.2		+0.2	%
		Dual		-1.0		+1.0	
Voltage Adjustability	Single Output	24Vout		-10		+20	%
		Others		-10		+10	
Cross Regulation	Asymmetrical Load 25%/100% FL	Dual		-5.0		+5.0	%
Output Power				See Table			
Output Current				See Table			
Maximum Capacitive Load				See Table			
Ripple & Noise (20MHz bandwidth)			Single				mVp-p
	With a 1µF M/C X7R and a 10µF T/C		3.3Vout, 5Vout		75		
	With a 1µF M/C X7R and a 10µF T/C		12Vout, 15Vout		100		
	With a 6.8µF/50V X7R MLCC		24Vout		100		
			Dual				
	With a 4.7µF/50V X7R MLCC for each output		24Vout		100		
	With a 1µF M/C X7R and a 10µF T/C for each output		Others		100		
Transient Response Recovery Time	25% load step change				250		µs
Start-Up Time	Constant Resistive Load	Power Up				30	ms
		Remote On/Off				30	
Temperature Coefficient				-0.02		+0.02	%/ºC

SPECIFICATIONS

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
REMOTE ON/OFF CONTROL[1]						
Positive Logic (standard)	DC-DC ON		Open or 3~15VDC			
	DC-DC OFF		Short or 0~1.2VDC			
Negative Logic (option)	DC-DC ON		Short or 0~1.2VDC			
	DC-DC OFF		Open or 3~15VDC			
Input Current of CTRL Pin			-0.5		1.0	mA
Remote OFF Input Current				2.5		mA
PROTECTION						
Short Circuit Protection			Continuous, Automatic Recovery			
Over Load Protection	% of Lout Rated; Hiccup Mode			150		%
Over Voltage Protection	3.3Vout		3.7		5.4	VDC
	5Vout		5.6		7.0	
	12Vout		13.5		19.6	
	15Vout		16.8		20.5	
	24Vout		29.1		32.5	
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature	With Derating		-40		+105	ºC
Maximum Case Temperature					105	ºC
Storage Temperature Range			-55		+125	ºC
Thermal Impedance	Without Heat-Sink			18.2		ºC/W
	With Heat-Sink			15.8		
Thermal Shock			MIL-STD-810F			
Relative Humidity			5		95	%RH
Vibration			MIL-STD-810F			
MTBF	MIL-HDBK-217F, Full Load		1.600×10^6 hrs			
GENERAL SPECIFICATIONS						
Efficiency			See Table			
Switching Frequency			360	400	440	kHz
Isolation Voltage	1 Minute	Input to Output	1600			VDC
		Input (Output) to Case	1000			
Isolation Resistance	500VDC		1			GΩ
Isolation Capacitance					1000	pF
PHYSICAL SPECIFICATIONS						
Weight			0.53oz (15g)			
Dimensions (L x W x H)			1.0in x 1.0in x 0.39in (25.4mm x 25.4mm x 9.9mm)			
Case Material			Nickel-Coated Copper			
Base Material			FR4 PCB			
Potting Material			Epoxy (UL94 V-0)			
SAFETY & EMC CHARACTERISTICS						
Safety Approvals[2]			IEC/EN/UL62368-1			
EMI	EN55022	With external components	Class A Class B			
EMS	EN55035					
ESD	EN61000-4-2	Air ±8kV and Contact ±6kV	Perf. Criteria A			
Radiated Immunity	EN61000-4-3	10 V/m	Perf. Criteria A			
Fast Transient[3]	EN61000-4-4	±2kV	Perf. Criteria A			
Surge[3]	EN61000-4-5	±1kV	Perf. Criteria A			
Conducted Immunity	EN61000-4-6	3 Vr.m.s	Perf. Criteria A			
Power Frequency Magnetic Field	EN61000-4-8	100A/m continuous; 1000A/m 1 second	Perf. Criteria A			

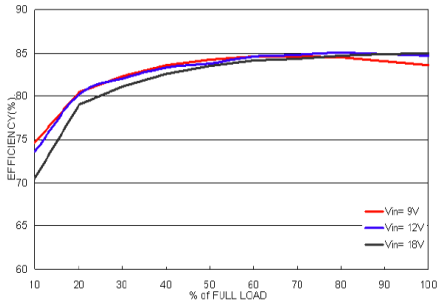
NOTES

(1) Referred to -Vin pin
(2) This product is Listed to applicable standards and requirements by UL.
(3) With an external input filter capacitor (Nippon chemi-con KY series, 220µF/100V)
Caution: This power module is not internally fused. An input line fuse must always be used.
**Due to advances in technology, specifications subject to change without notice.*

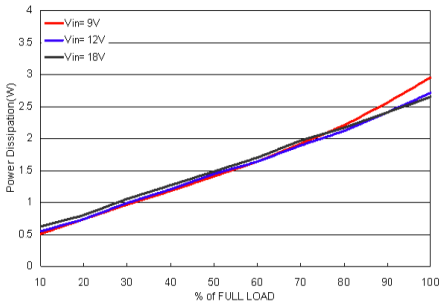
CHARACTERISTIC CURVES

All test conditions are at 25ºC

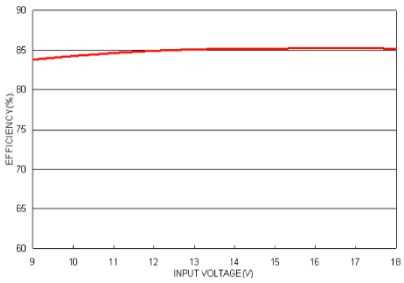
JFC12D5-1500 Efficiency vs. Output Load



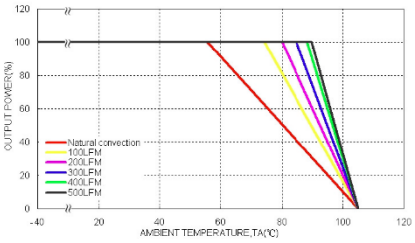
JFC12D5-1500 Power Dissipation vs. Output Load



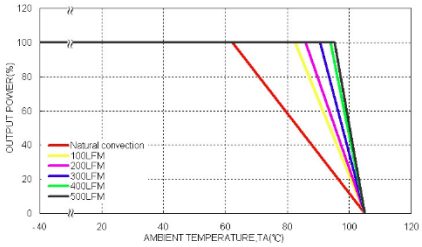
JFC12D5-1500 Efficiency vs. Input Voltage, Full Load



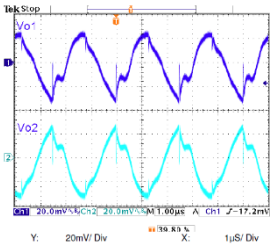
JFC12D5-1500 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



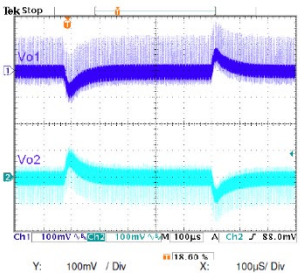
JFC12D5-1500 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



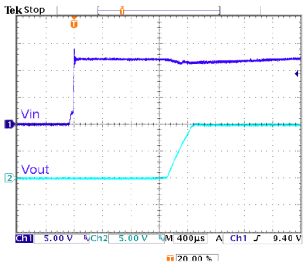
JFC12D5-1500 Typical Output Ripple and Noise Vin (nom); Full Load



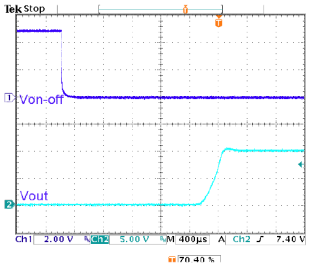
JFC12D5-1500 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



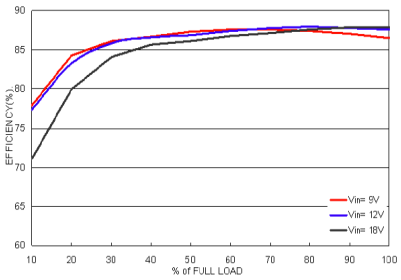
JFC12D5-1500 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



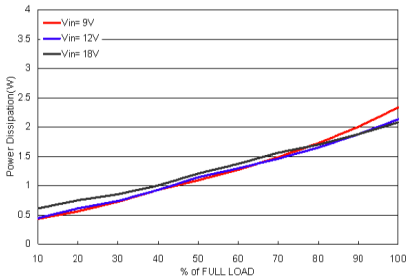
JFC12D5-1500 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



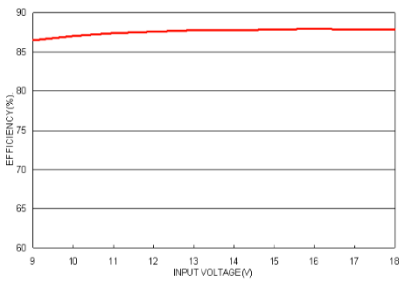
JFC12D12-625 Efficiency vs. Output Load



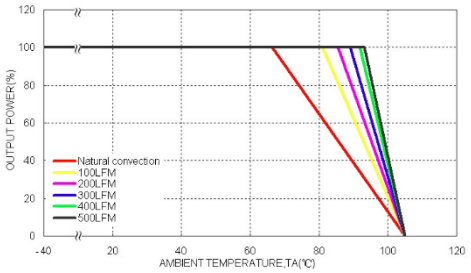
JFC12D12-625 Power Dissipation vs. Output Load



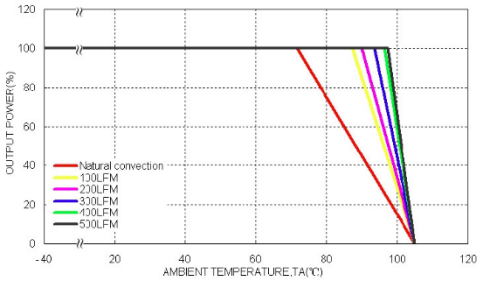
JFC12D12-625 Efficiency vs. Input Voltage, Full Load



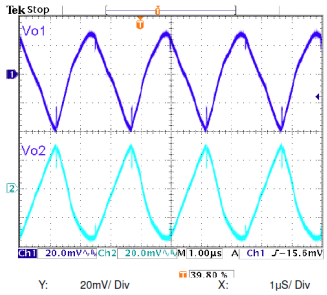
JFC12D12-625 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



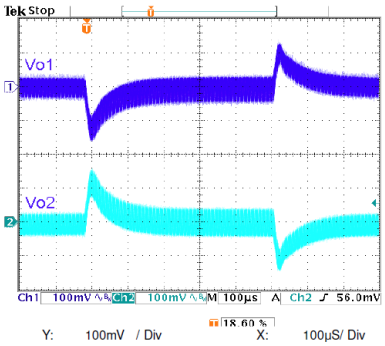
JFC12D12-625 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



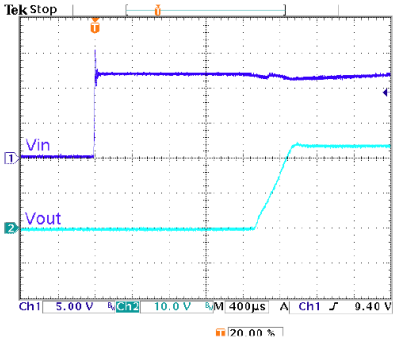
JFC12D12-625 Typical Output Ripple and Noise Vin (nom); Full Load



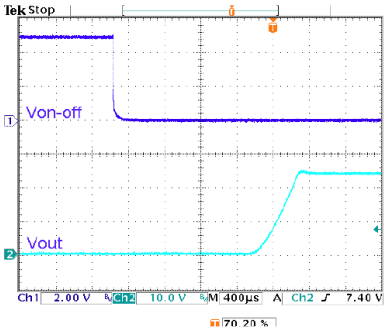
JFC12D12-625 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



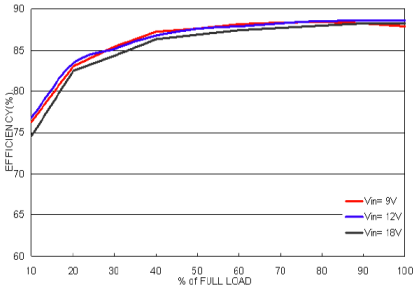
JFC12D12-625 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



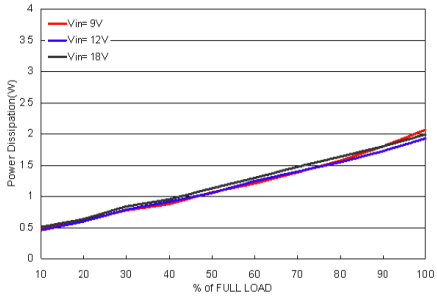
JFC12D12-625 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



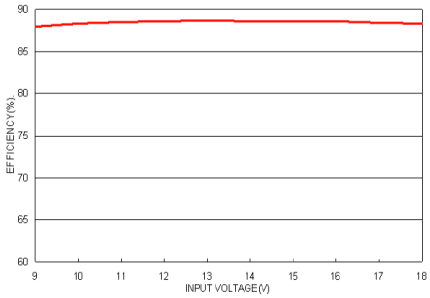
JFC12D15-500 Efficiency vs. Output Load



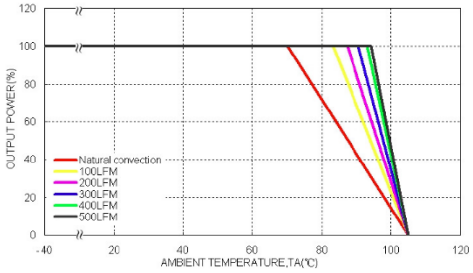
JFC12D15-500 Power Dissipation vs. Output Load



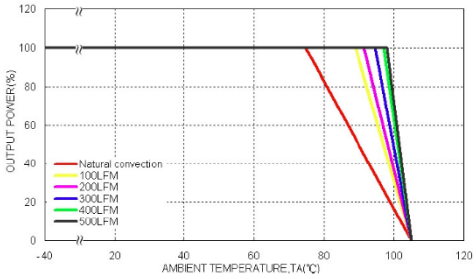
JFC12D15-500 Efficiency vs. Input Voltage, Full Load



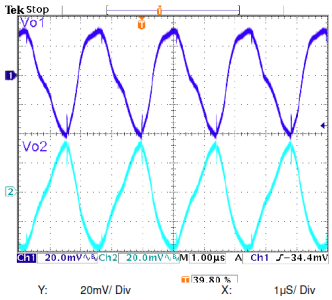
JFC12D15-500 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



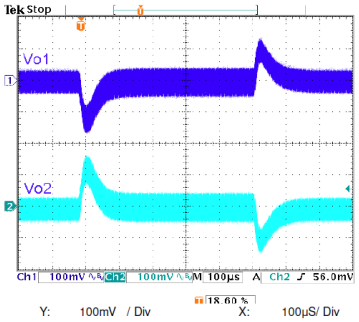
JFC12D15-500 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



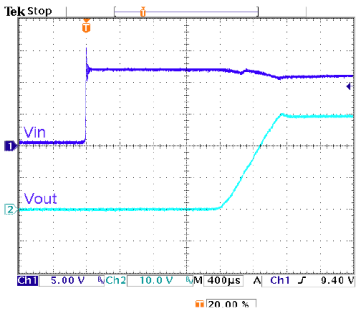
JFC12D15-500 Typical Output Ripple and Noise Vin (nom); Full Load



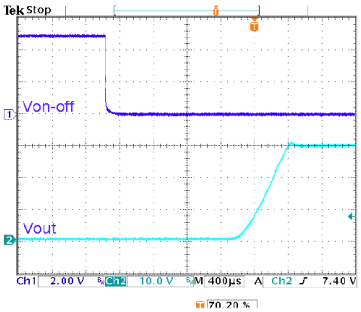
JFC12D15-500 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



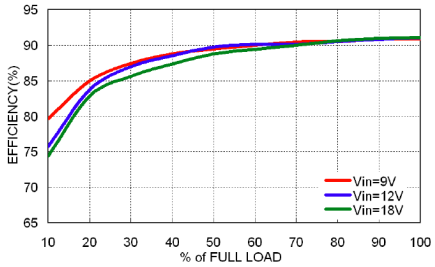
JFC12D15-500 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



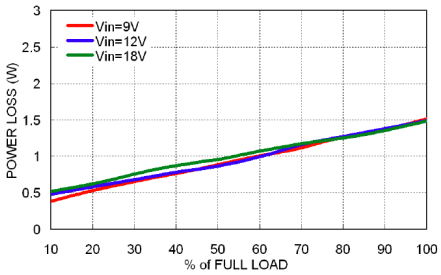
JFC12D15-500 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



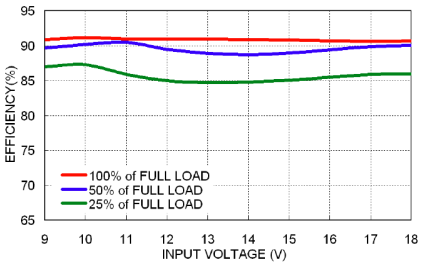
JFC12D24-315 Efficiency vs. Output Load



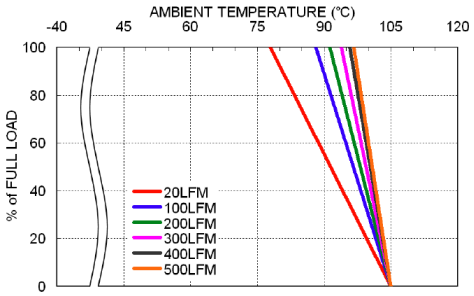
JFC12D24-315 Power Dissipation vs. Output Load



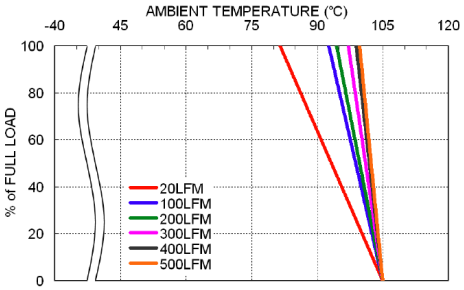
JFC12D24-315 Efficiency vs. Input Voltage, Full Load



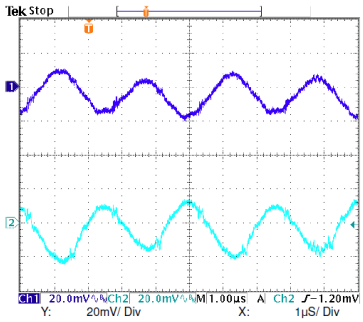
JFC12D24-315 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



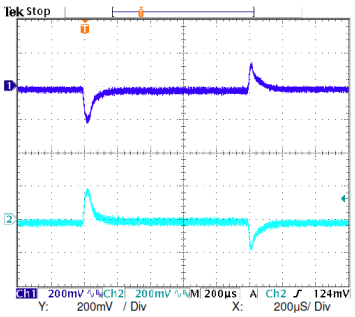
JFC12D24-315 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



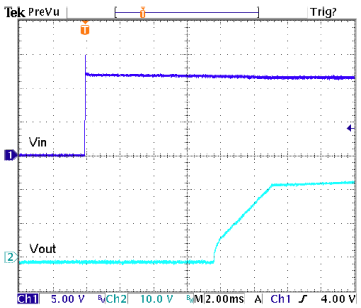
JFC12D24-315 Typical Output Ripple and Noise Vin (nom); Full Load



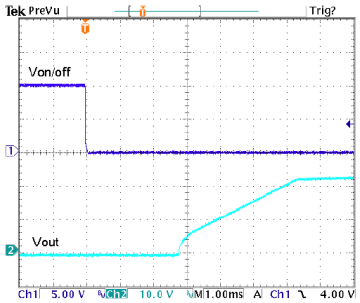
JFC12D24-315 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



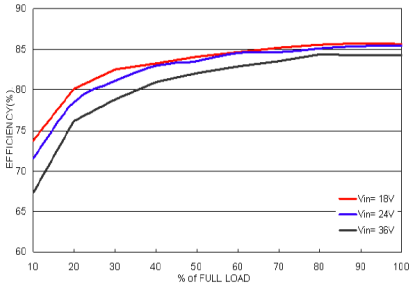
JFC12D24-315 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



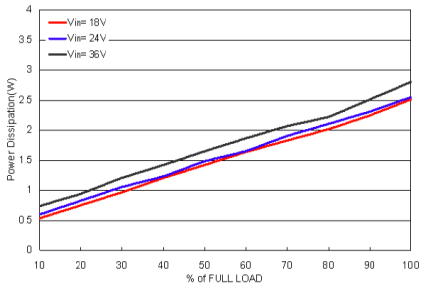
JFC12D24-315 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



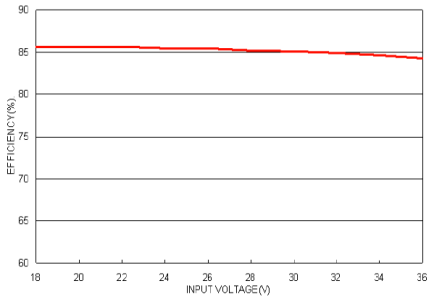
JFC24D5-1500 Efficiency vs. Output Load



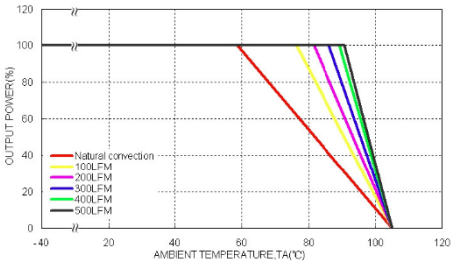
JFC24D5-1500 Power Dissipation vs. Output Load



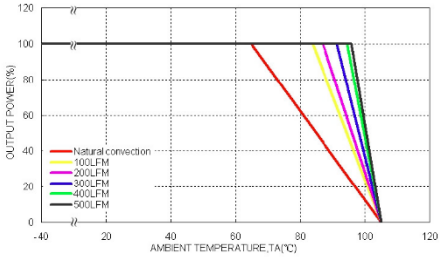
JFC24D5-1500 Efficiency vs. Input Voltage, Full Load



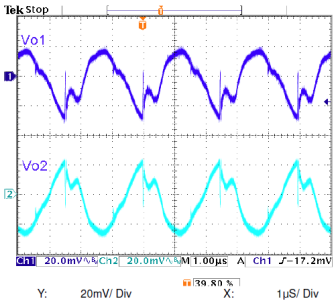
JFC24D5-1500 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



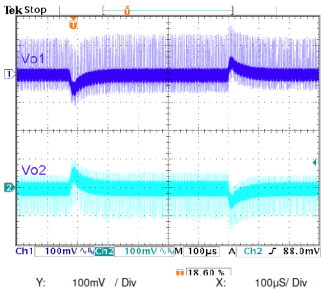
JFC24D5-1500 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



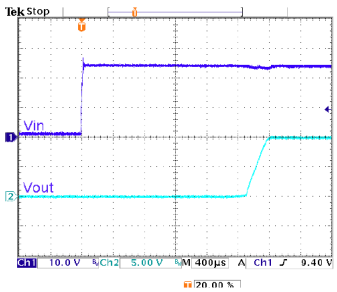
JFC24D5-1500 Typical Output Ripple and Noise Vin (nom); Full Load



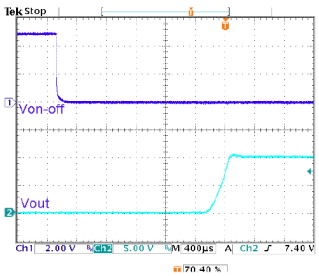
JFC24D5-1500 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



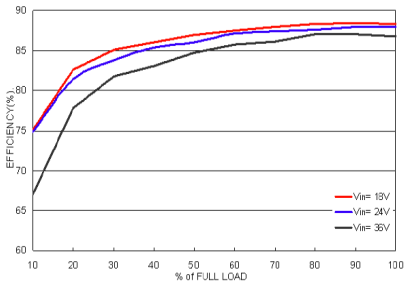
JFC24D5-1500 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



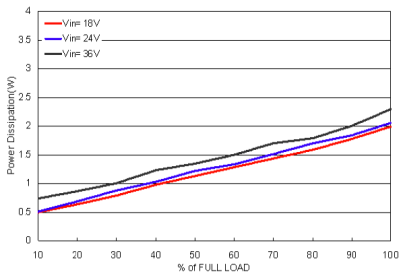
JFC24D5-1500 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



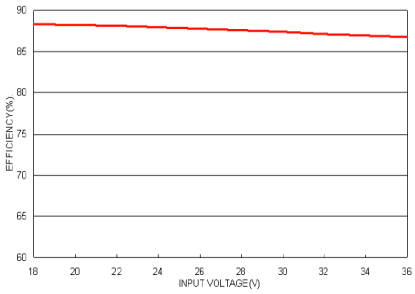
JFC24D12-625 Efficiency vs. Output Load



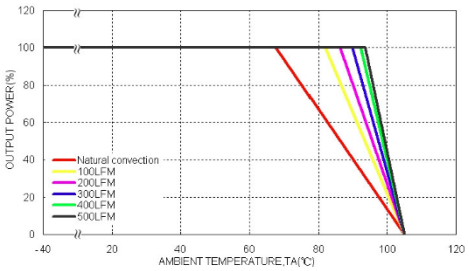
JFC24D12-625 Power Dissipation vs. Output Load



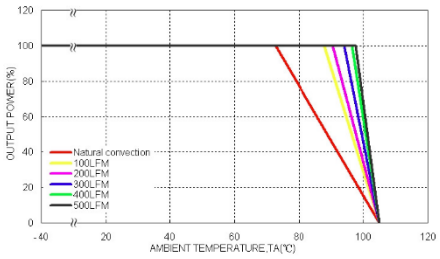
JFC24D12-625 Efficiency vs. Input Voltage, Full Load



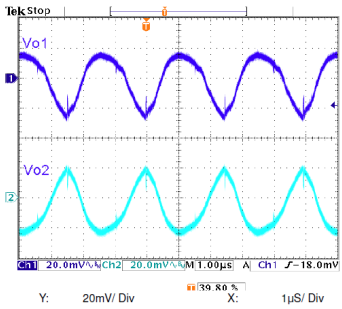
JFC24D12-625 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



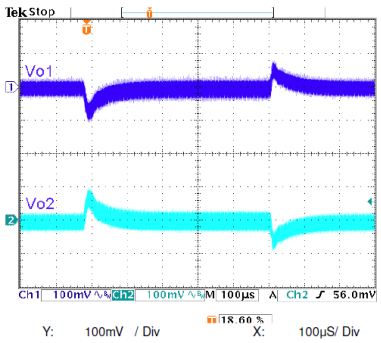
JFC24D12-625 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



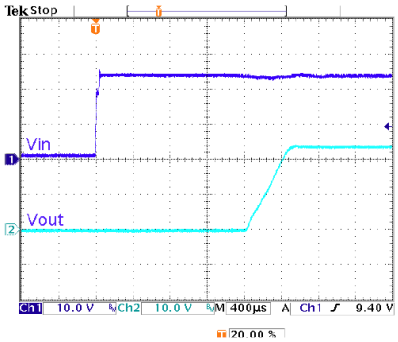
JFC24D12-625 Typical Output Ripple and Noise Vin (nom); Full Load



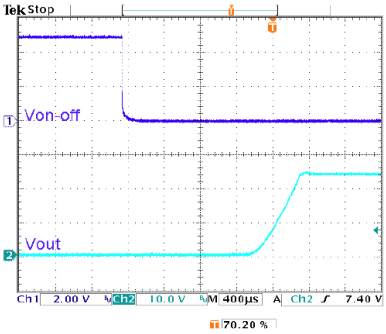
JFC24D12-625 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



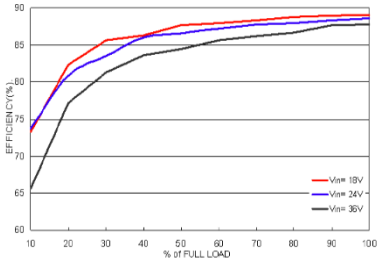
JFC24D12-625 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



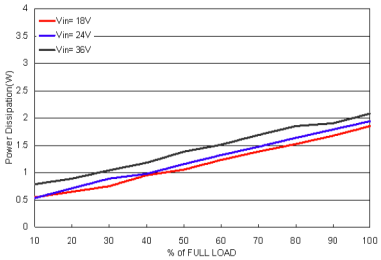
JFC24D12-625 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



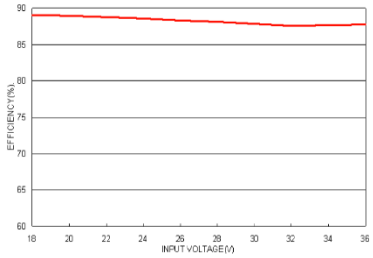
JFC24D15-500 Efficiency vs. Output Load



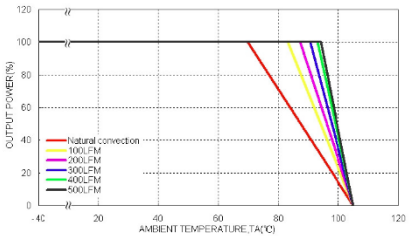
JFC24D15-500 Power Dissipation vs. Output Load



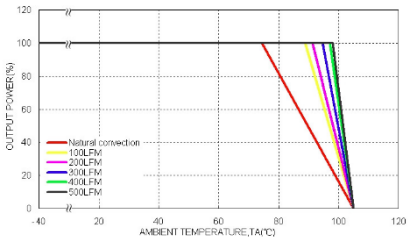
JFC24D15-500 Efficiency vs. Input Voltage, Full Load



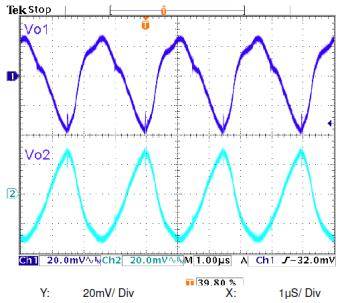
JFC24D15-500 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



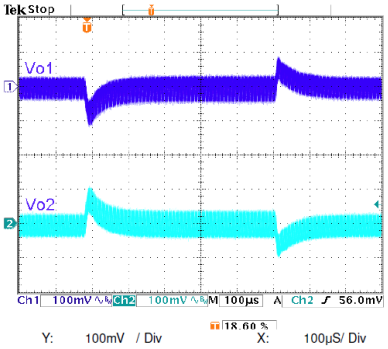
JFC24D15-500 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



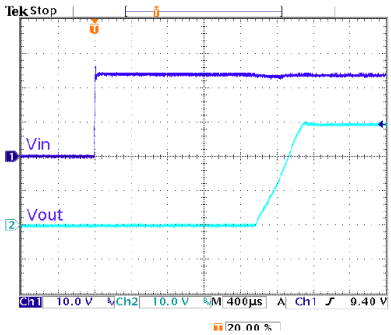
JFC24D15-500 Typical Output Ripple and Noise Vin (nom); Full Load



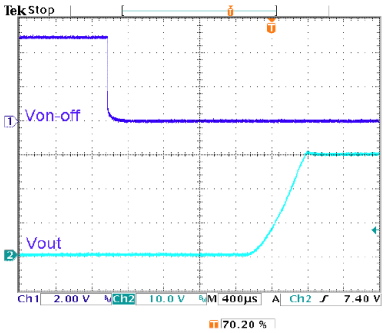
Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



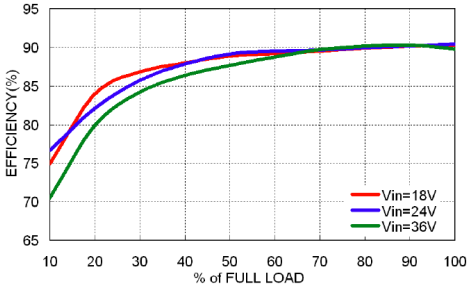
Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



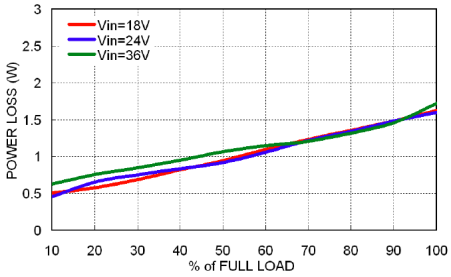
Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



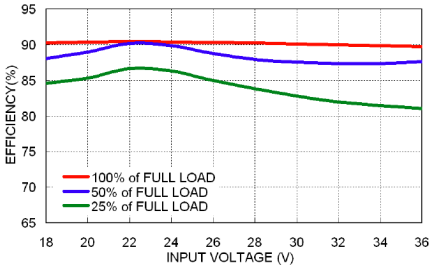
JFC24D24-315 Efficiency vs. Output Load



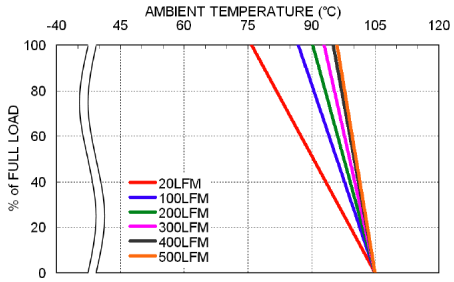
JFC24D24-315 Power Dissipation vs. Output Load



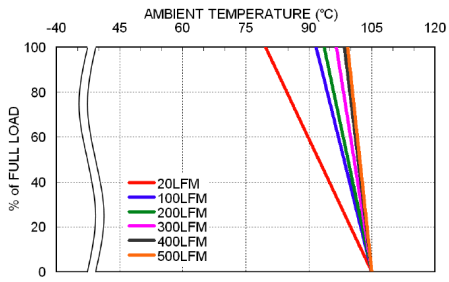
JFC24D24-315 Efficiency vs. Input Voltage, Full Load



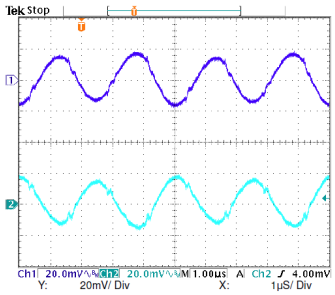
JFC24D24-315 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



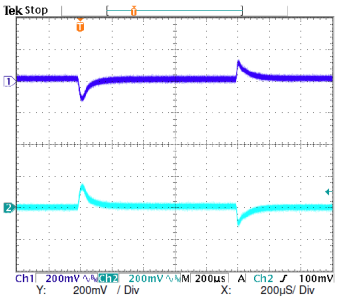
JFC24D24-315 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



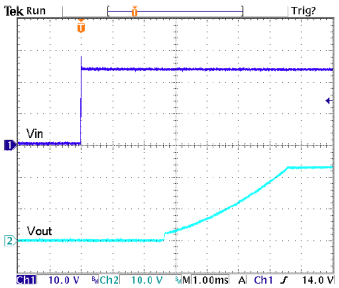
JFC24D24-315 Typical Output Ripple and Noise Vin (nom); Full Load



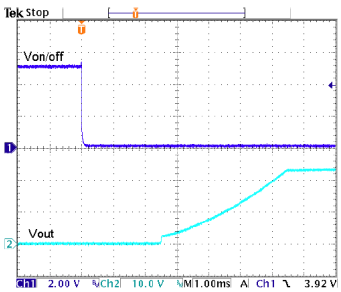
JFC24D24-315 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



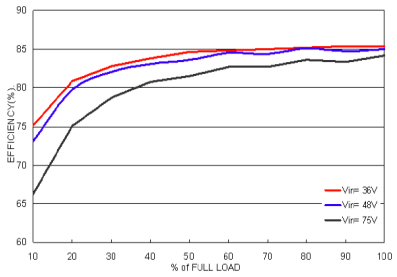
JFC24D24-315 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



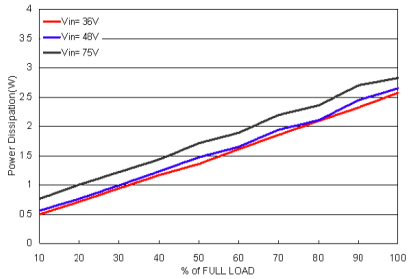
JFC24D24-315 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



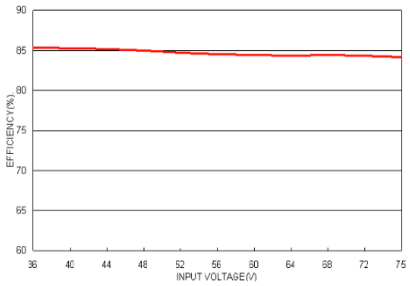
JFC48D5-1500 Efficiency vs. Output Load



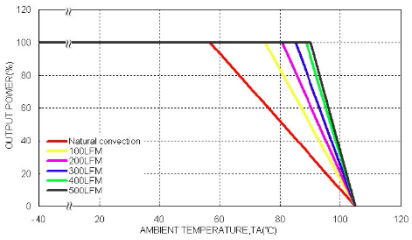
JFC48D5-1500 Power Dissipation vs. Output Load



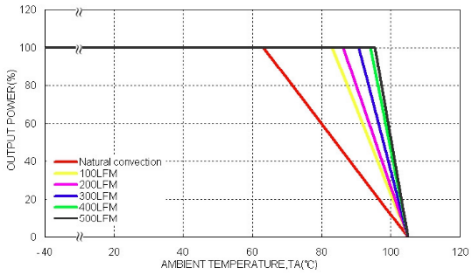
JFC48D5-1500 Efficiency vs. Input Voltage, Full Load



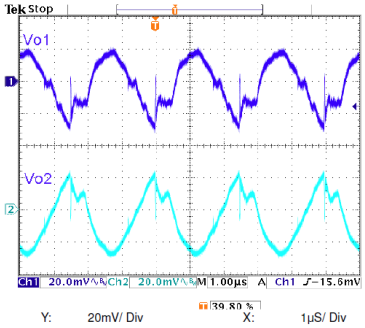
JFC48D5-1500 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



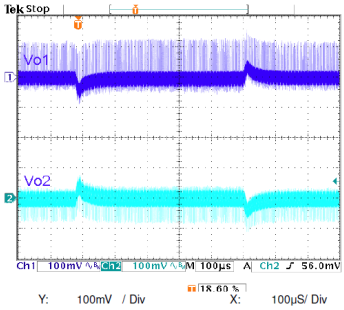
JFC48D5-1500 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



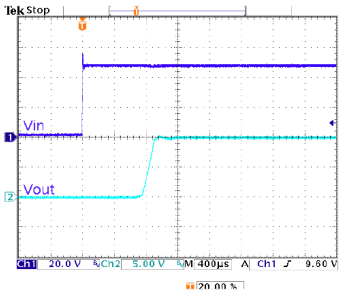
JFC48D5-1500 Typical Output Ripple and Noise Vin (nom); Full Load



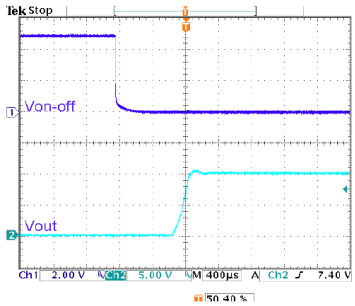
JFC48D5-1500 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



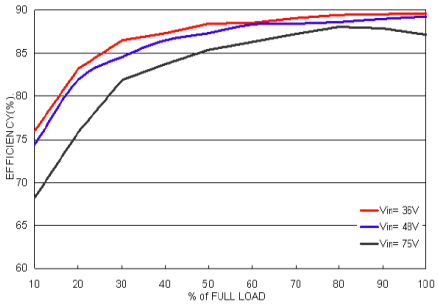
JFC48D5-1500 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



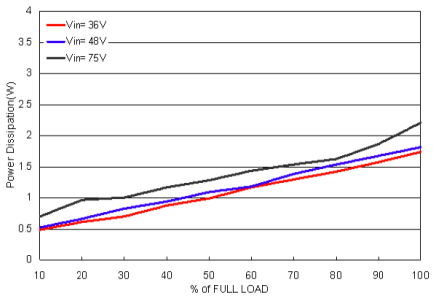
JFC48D5-1500 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



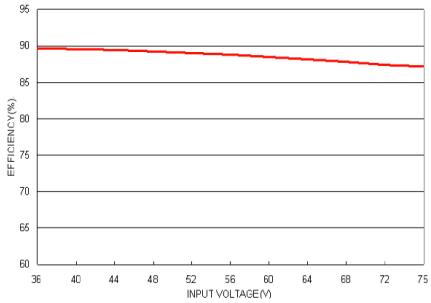
JFC48D12-625 Efficiency vs. Output Load



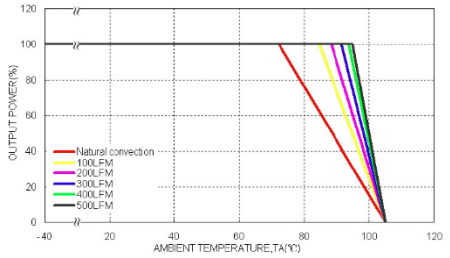
JFC48D12-625 Power Dissipation vs. Output Load



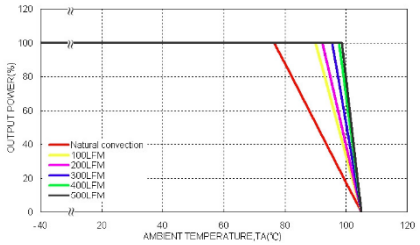
JFC48D12-625 Efficiency vs. Input Voltage, Full Load



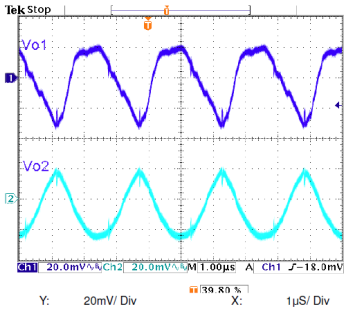
JFC48D12-625 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



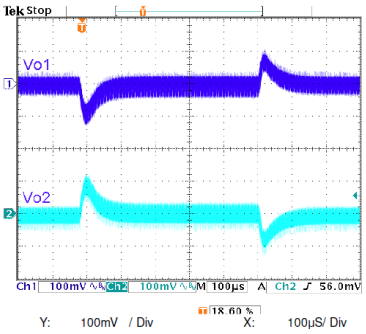
JFC48D12-625 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



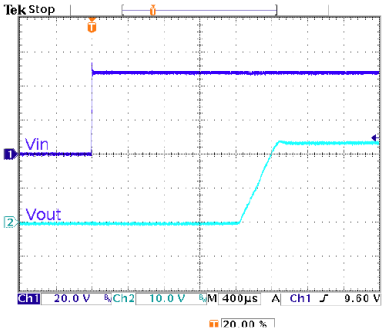
JFC48D12-625 Typical Output Ripple and Noise Vin (nom); Full Load



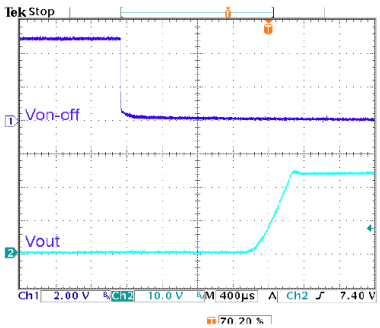
JFC48D12-625 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



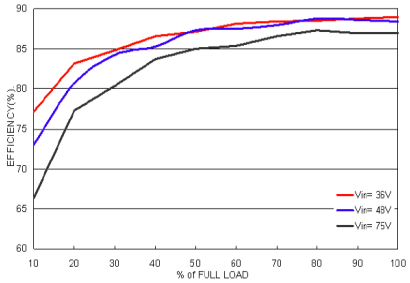
JFC48D12-625 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



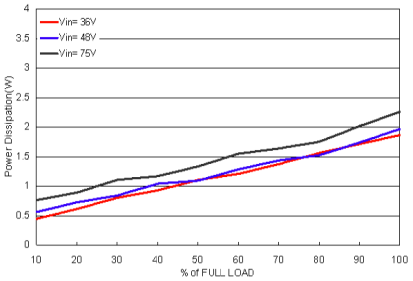
JFC48D12-625 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



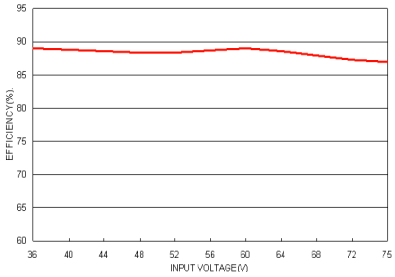
JFC48D15-500 Efficiency vs. Output Load



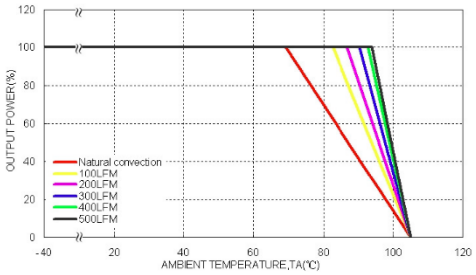
JFC48D15-500 Power Dissipation vs. Output Load



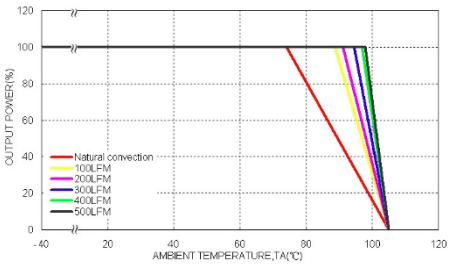
JFC48D15-500 Efficiency vs. Input Voltage, Full Load



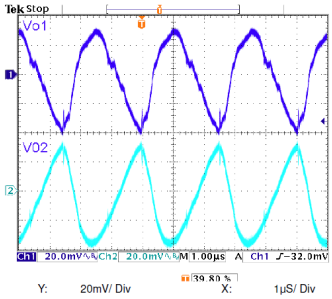
JFC48D15-500 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



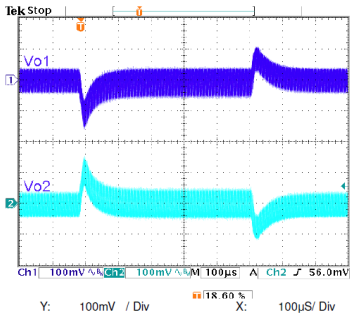
JFC48D15-500 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



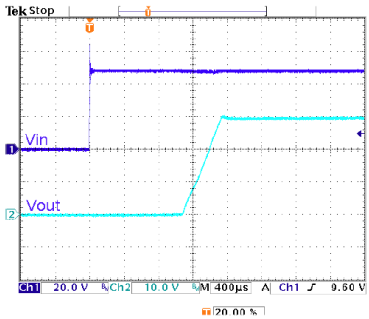
JFC48D15-500 Typical Output Ripple and Noise Vin (nom); Full Load



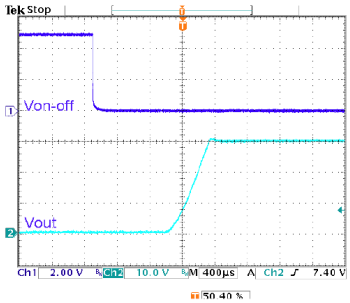
JFC48D15-500 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



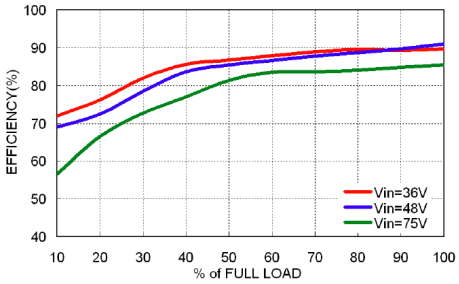
JFC48D15-500 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



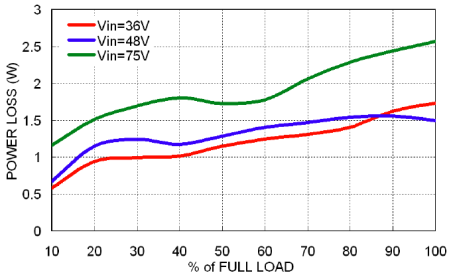
JFC48D15-500 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



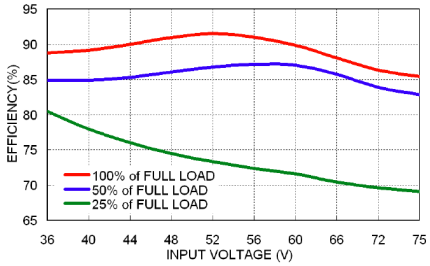
JFC48D24-315 Efficiency vs. Output Load



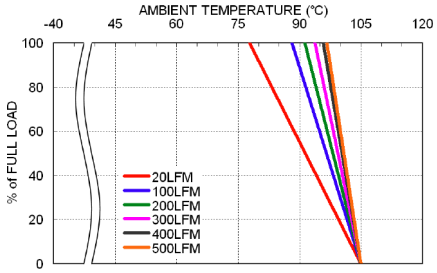
JFC48D24-315 Power Dissipation vs. Output Load



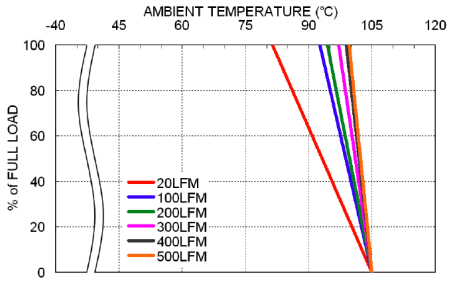
JFC48D24-315 Efficiency vs. Input Voltage, Full Load



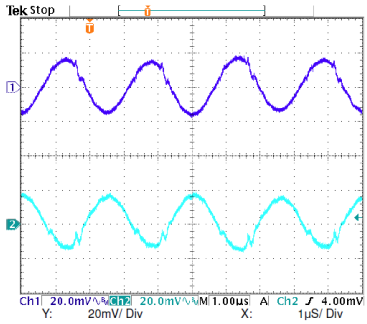
JFC48D24-315 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



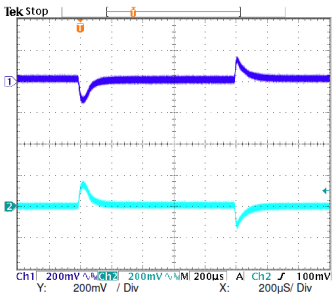
JFC48D24-315 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



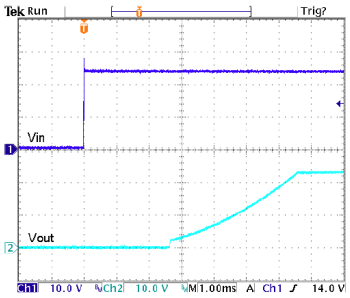
JFC48D24-315 Typical Output Ripple and Noise Vin (nom); Full Load



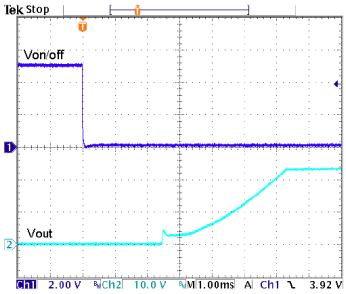
JFC48D24-315 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



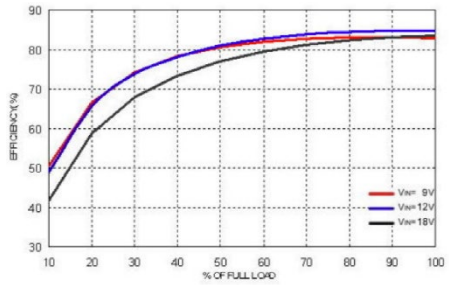
JFC48D24-315 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



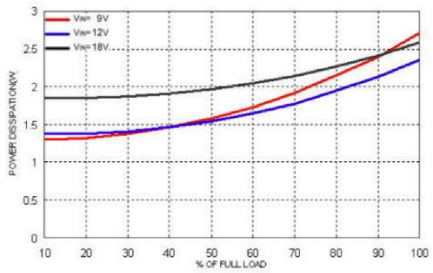
JFC48D24-315 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



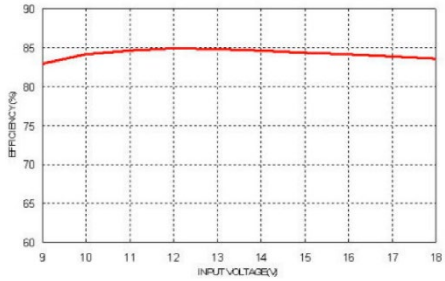
JFC12S3.3-4000 Efficiency vs. Output Load



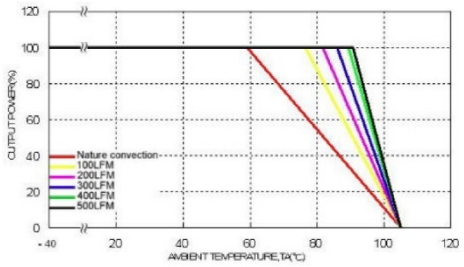
JFC12S3.3-4000 Power Dissipation vs. Output Load



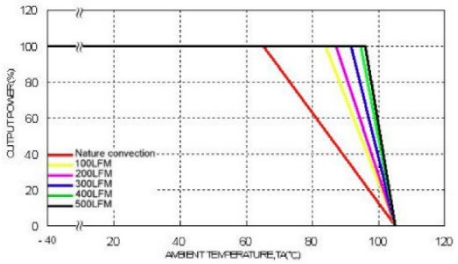
JFC12S3.3-4000 Efficiency vs. Input Voltage, Full Load



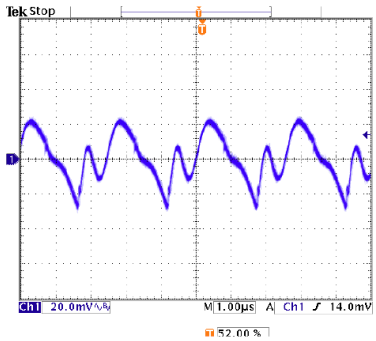
JFC12S3.3-4000 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



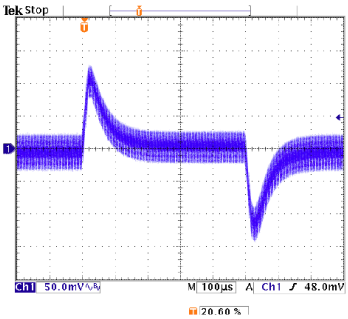
JFC12S3.3-4000 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



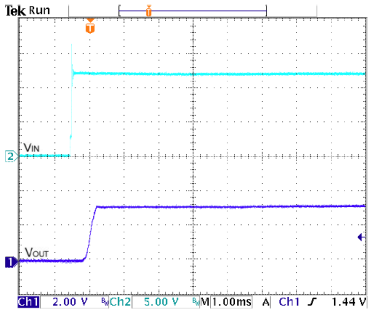
JFC12S3.3-4000 Typical Output Ripple and Noise Vin (nom); Full Load



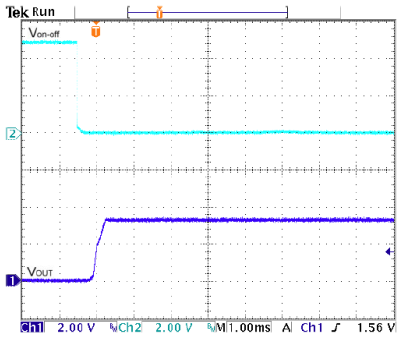
JFC12S3.3-4000 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



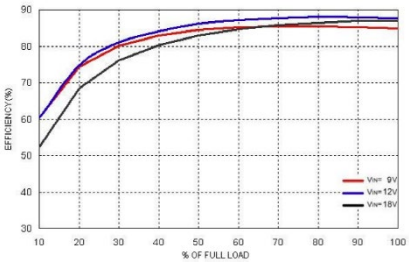
JFC12S3.3-4000 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



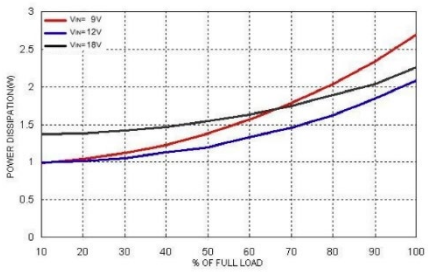
JFC12S3.3-4000 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



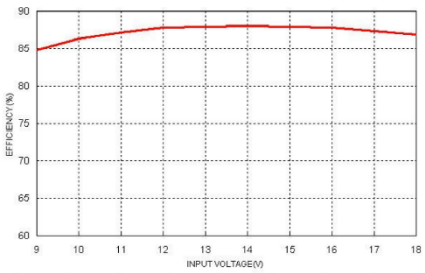
JFC12S5-3000 Efficiency vs. Output Load



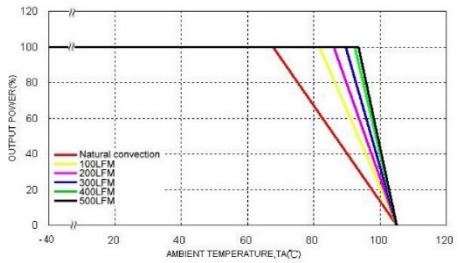
JFC12S5-3000 Power Dissipation vs. Output Load



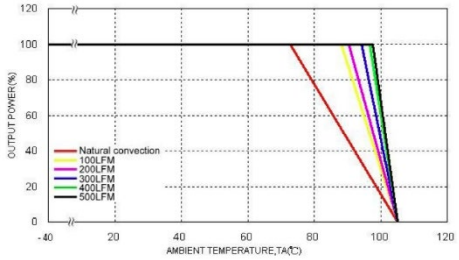
JFC12S5-3000 Efficiency vs. Input Voltage, Full Load



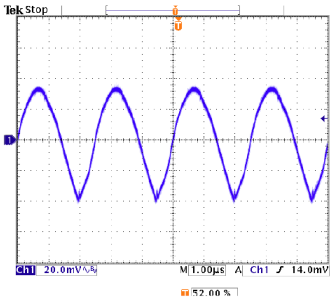
JFC12S5-3000 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



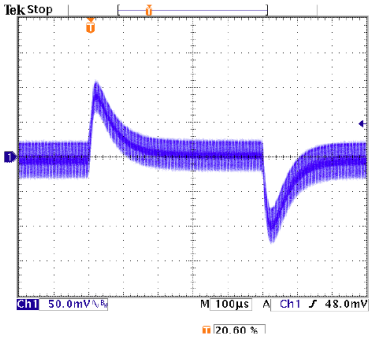
JFC12S5-3000 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



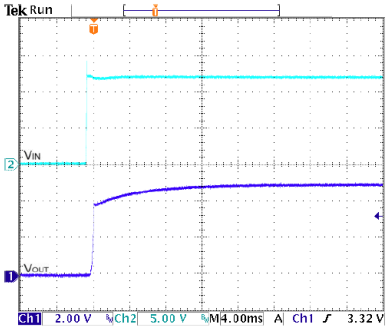
JFC12S5-3000 Typical Output Ripple and Noise Vin (nom); Full Load



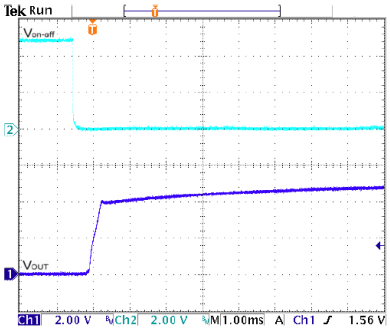
JFC12S5-3000 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



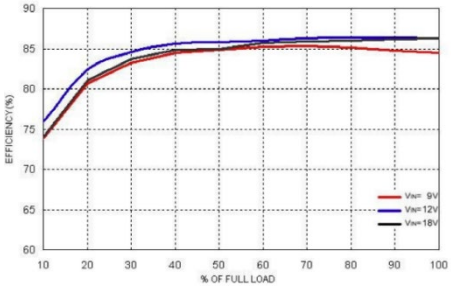
JFC12S5-3000 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



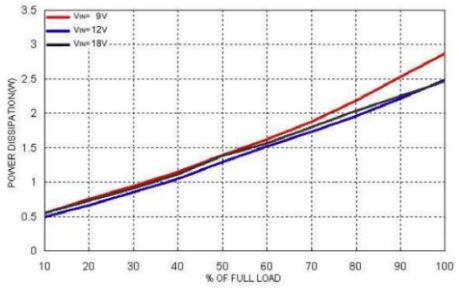
JFC12S5-3000 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



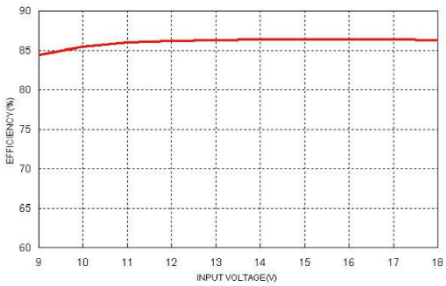
JFC12S12-1300 Efficiency vs. Output Load



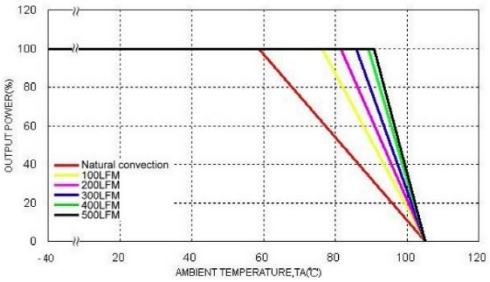
JFC12S12-1300 Power Dissipation vs. Output Load



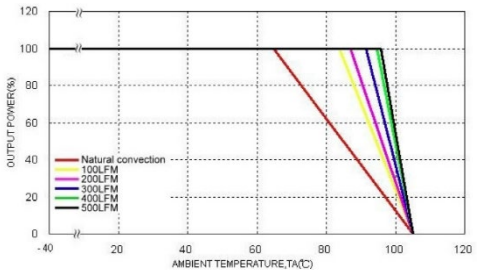
JFC12S12-1300 Efficiency vs. Input Voltage, Full Load



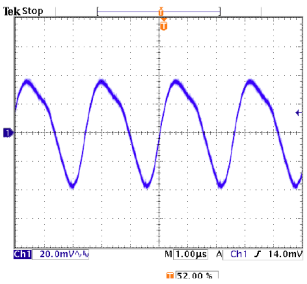
JFC12S12-1300 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



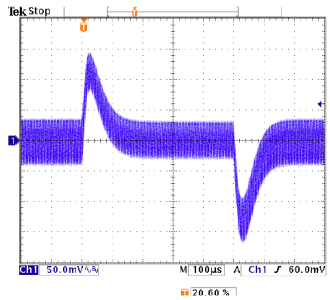
JFC12S12-1300 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



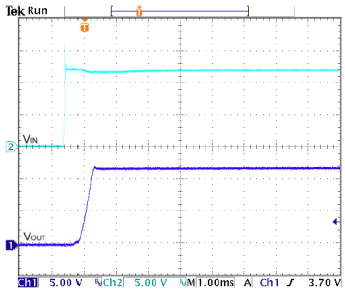
JFC12S12-1300 Typical Output Ripple and Noise Vin (nom); Full Load



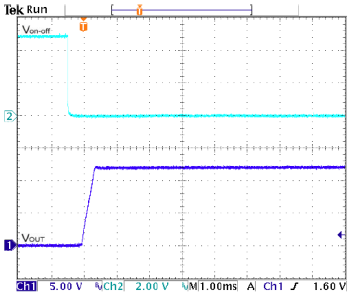
JFC12S12-1300 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



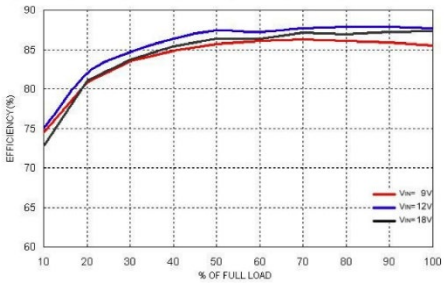
JFC12S12-1300 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



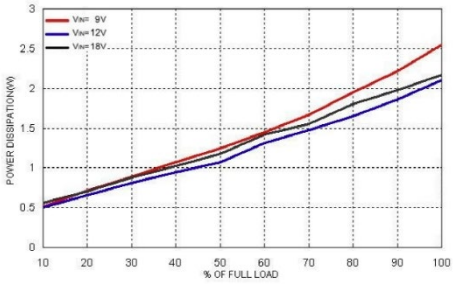
JFC12S12-1300 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



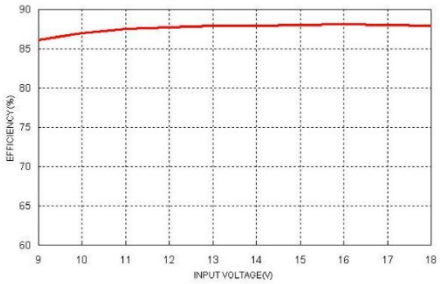
JFC12S15-1000 Efficiency vs. Output Load



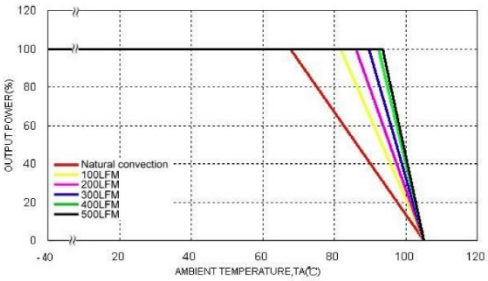
JFC12S15-1000 Power Dissipation vs. Output Load



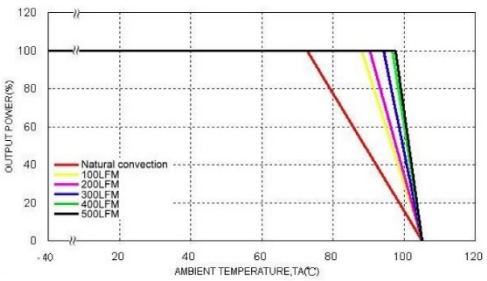
JFC12S15-1000 Efficiency vs. Input Voltage, Full Load



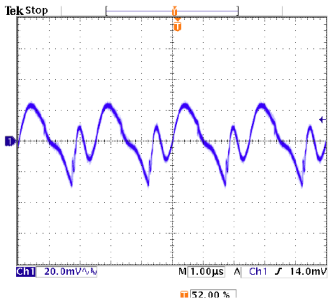
JFC12S15-1000 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



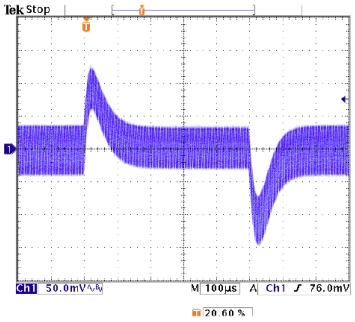
JFC12S15-1000 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



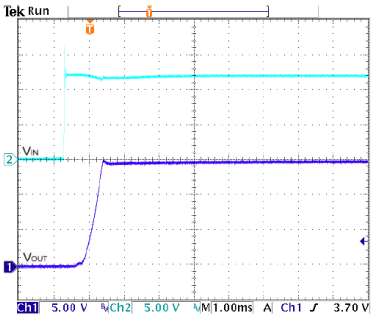
JFC12S15-1000 Typical Output Ripple and Noise Vin (nom); Full Load



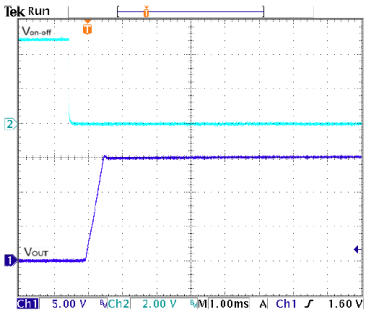
JFC12S15-1000 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



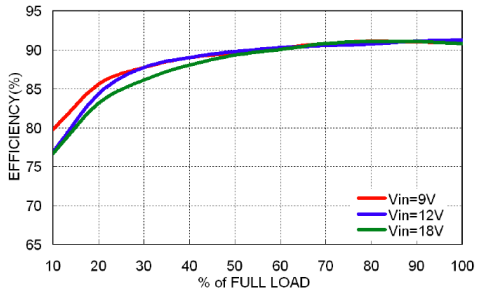
JFC12S15-1000 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



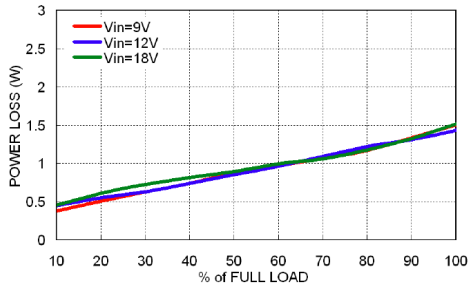
JFC12S15-1000 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



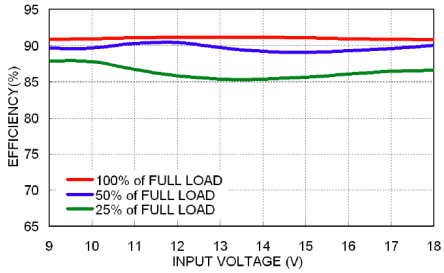
JFC12S24-625 Efficiency vs. Output Load



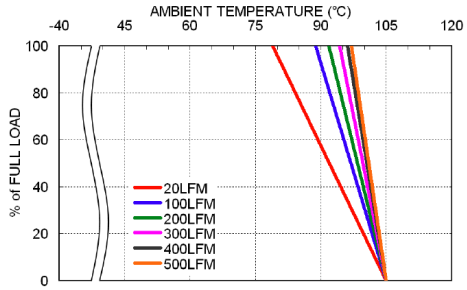
JFC12S24-625 Power Dissipation vs. Output Load



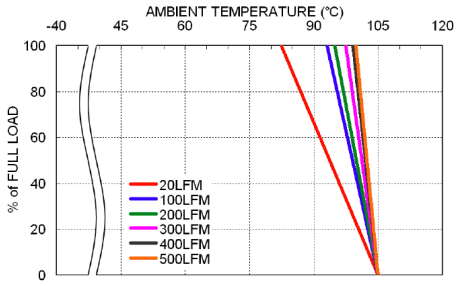
JFC12S24-625 Efficiency vs. Input Voltage, Full Load



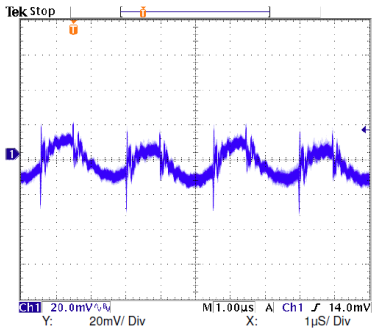
JFC12S24-625 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



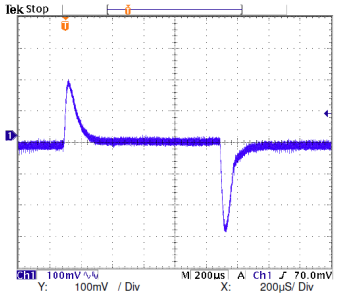
JFC12S24-625 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



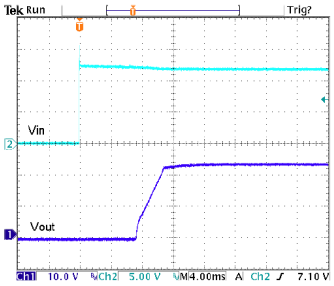
JFC12S24-625 Typical Output Ripple and Noise Vin (nom); Full Load



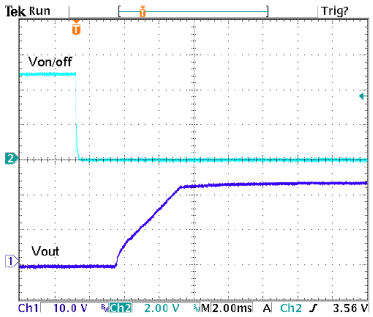
JFC12S24-625 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



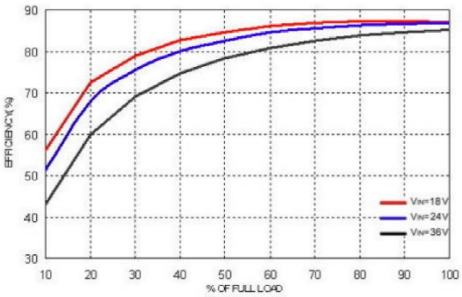
JFC12S24-625 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



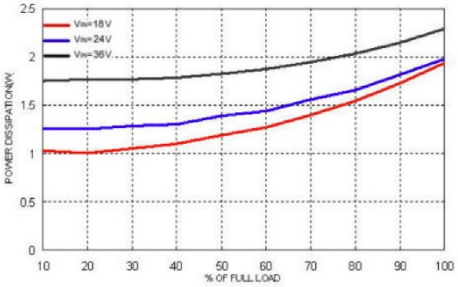
JFC12S24-625 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



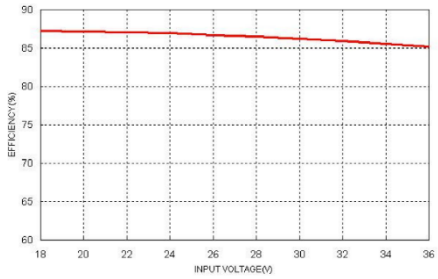
JFC24S3.3-4000 Efficiency vs. Output Load



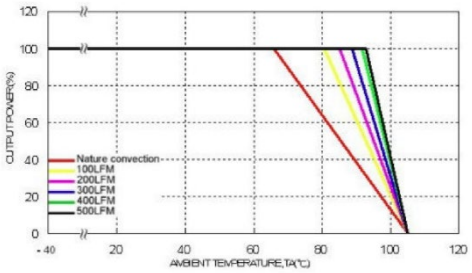
JFC24S3.3-4000 Power Dissipation vs. Output Load



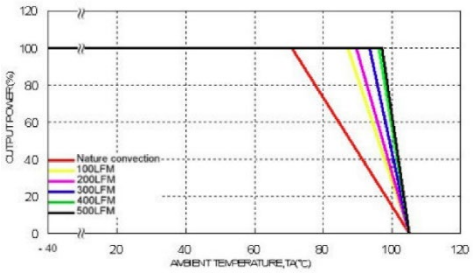
JFC24S3.3-4000 Efficiency vs. Input Voltage, Full Load



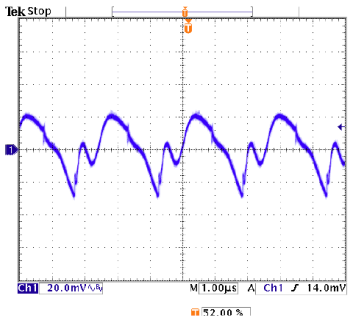
JFC24S3.3-4000 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



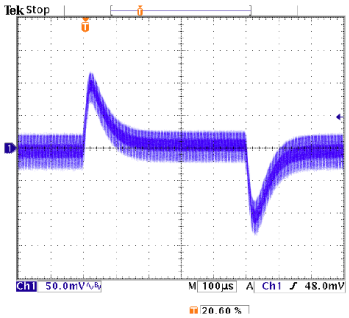
JFC24S3.3-4000 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



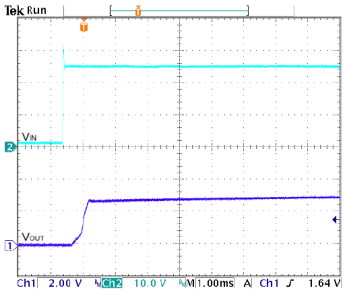
JFC24S3.3-4000 Typical Output Ripple and Noise Vin (nom); Full Load



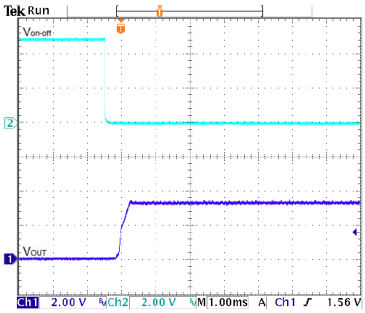
JFC24S3.3-4000 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



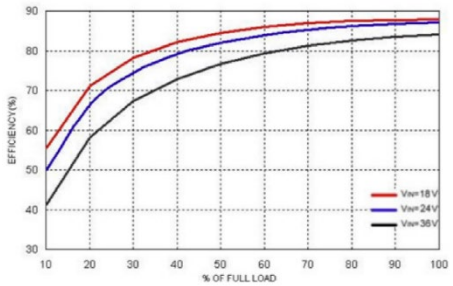
JFC24S3.3-4000 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



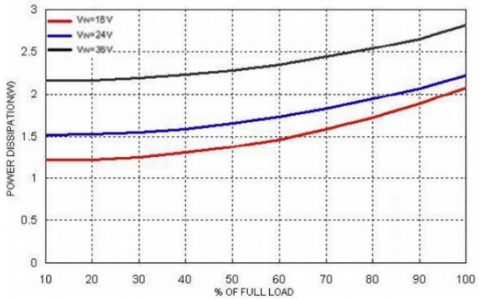
JFC24S3.3-4000 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



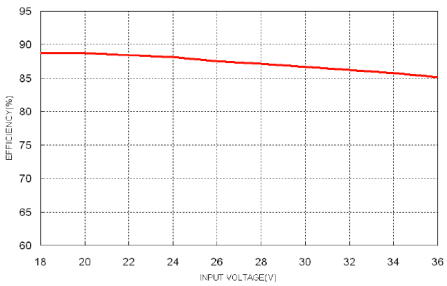
JFC24S5-3000 Efficiency vs. Output Load



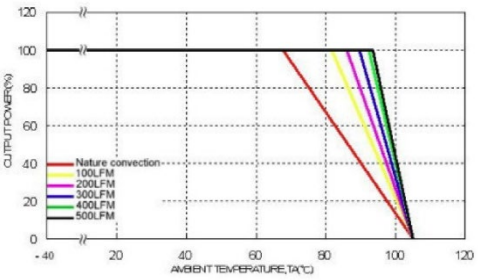
JFC24S5-3000 Power Dissipation vs. Output Load



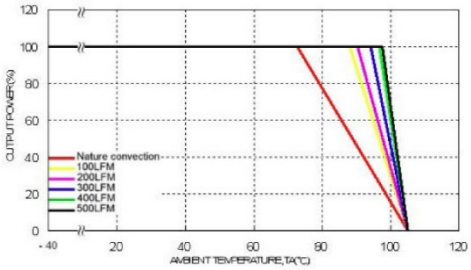
JFC24S5-3000 Efficiency vs. Input Voltage, Full Load



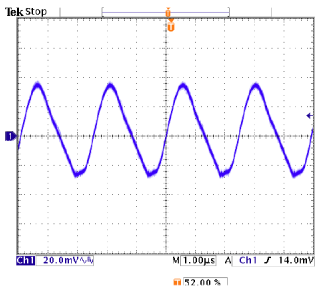
JFC24S5-3000 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



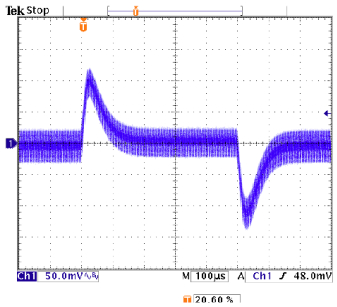
JFC24S5-3000 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



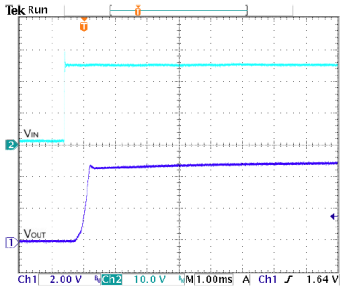
JFC24S5-3000 Typical Output Ripple and Noise Vin (nom); Full Load



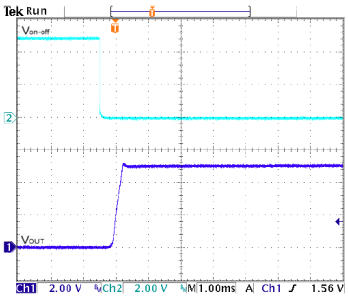
JFC24S5-3000 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



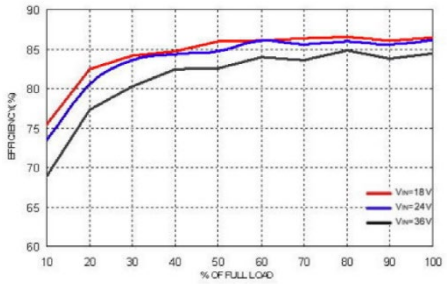
JFC24S5-3000 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



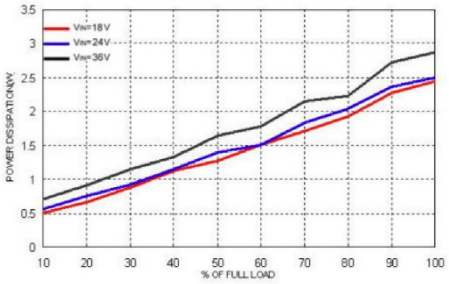
JFC24S5-3000 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



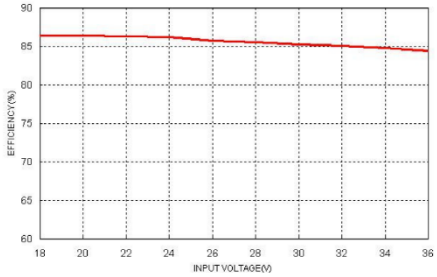
JFC24S12-1300 Efficiency vs. Output Load



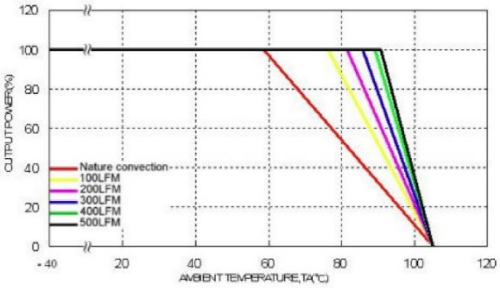
JFC24S12-1300 Power Dissipation vs. Output Load



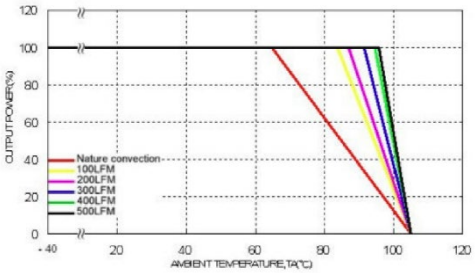
JFC24S12-1300 Efficiency vs. Input Voltage, Full Load



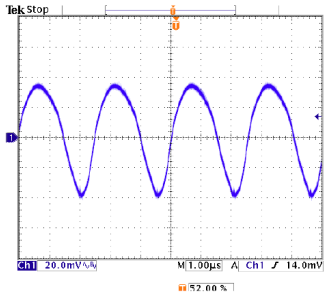
JFC24S12-1300 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



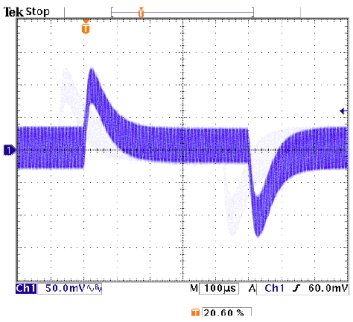
JFC24S12-1300 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



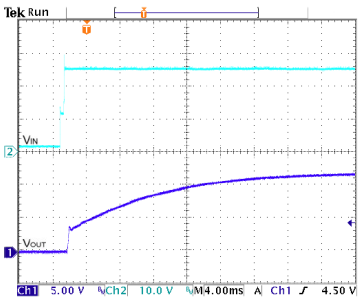
JFC24S12-1300 Typical Output Ripple and Noise Vin (nom); Full Load



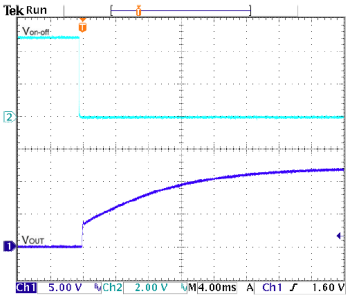
JFC24S12-1300 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



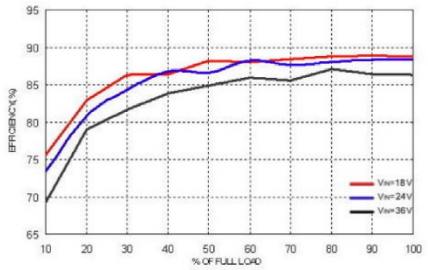
JFC24S12-1300 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



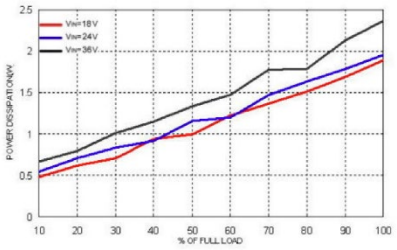
JFC24S12-1300 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



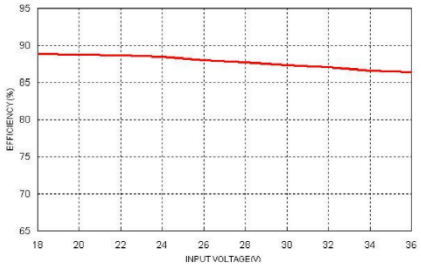
JFC24S15-1000 Efficiency vs. Output Load



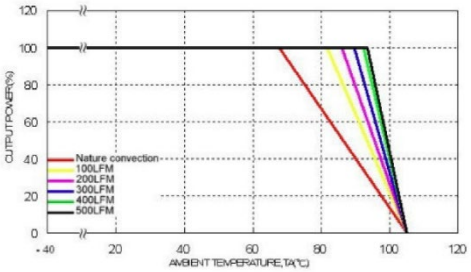
JFC24S15-1000 Power Dissipation vs. Output Load



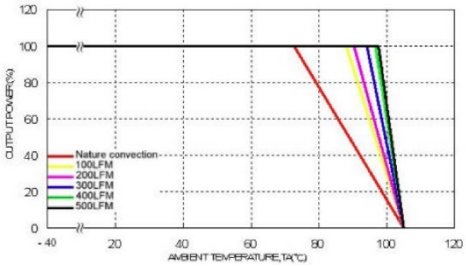
JFC24S15-1000 Efficiency vs. Input Voltage, Full Load



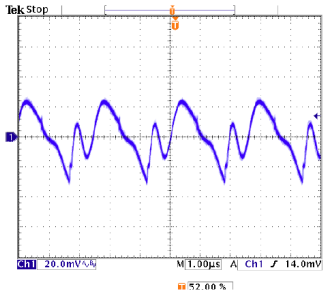
JFC24S15-1000 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



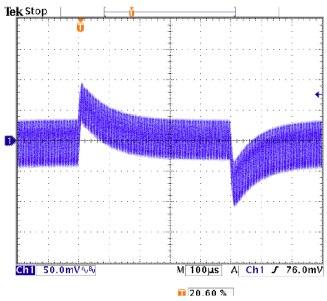
JFC24S15-1000 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



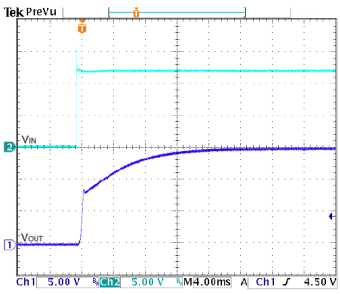
JFC24S15-1000 Typical Output Ripple and Noise Vin (nom); Full Load



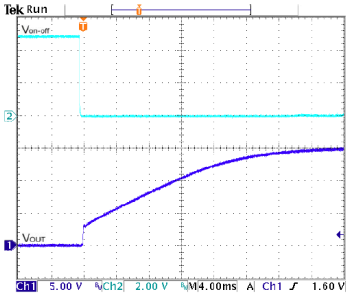
JFC24S15-1000 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



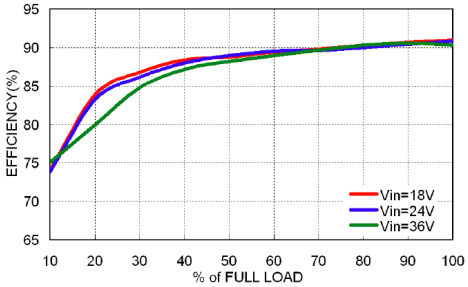
JFC24S15-1000 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



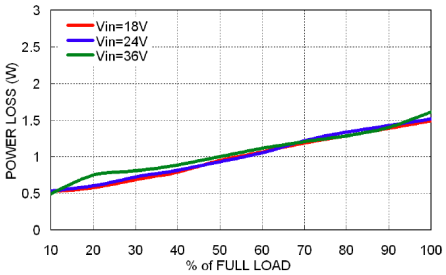
JFC24S15-1000 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



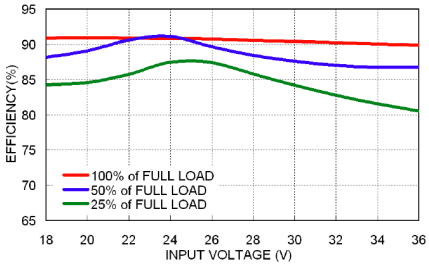
JFC24S24-625 Efficiency vs. Output Load



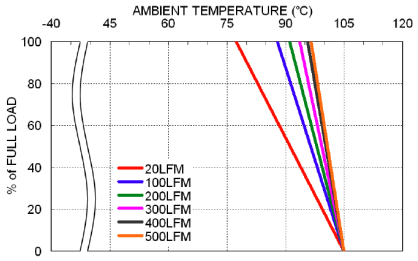
JFC24S24-625 Power Dissipation vs. Output Load



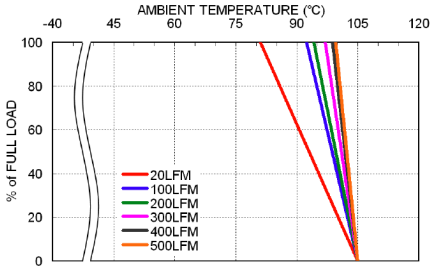
JFC24S24-625 Efficiency vs. Input Voltage, Full Load



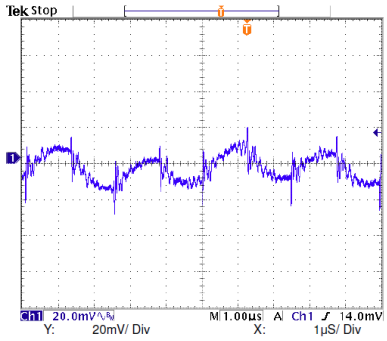
JFC24S24-625 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



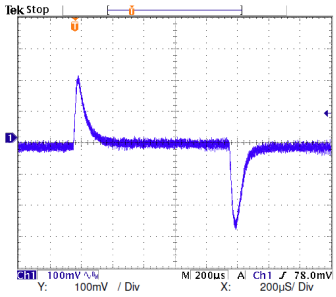
JFC24S24-625 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



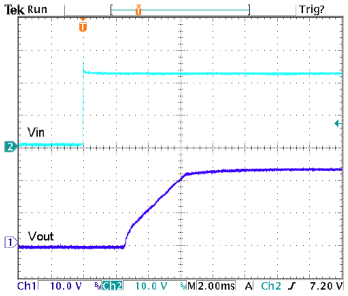
JFC24S24-625 Typical Output Ripple and Noise Vin (nom); Full Load



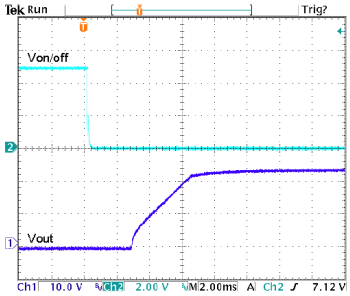
JFC24S24-625 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



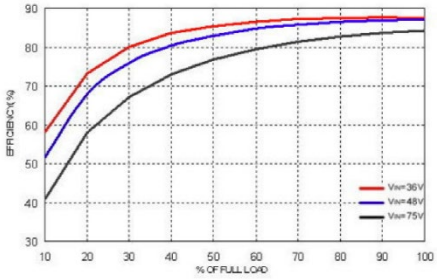
JFC24S24-625 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



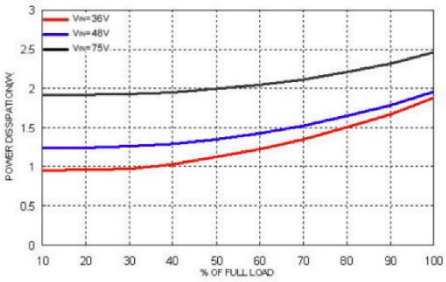
JFC24S24-625 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



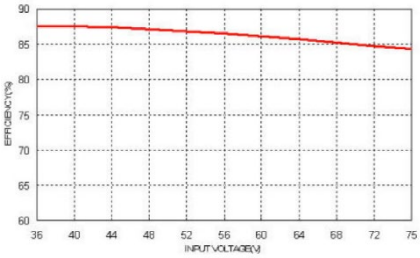
JFC48S3.3-4000 Efficiency vs. Output Load



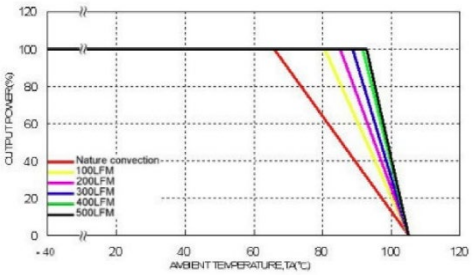
JFC48S3.3-4000 Power Dissipation vs. Output Load



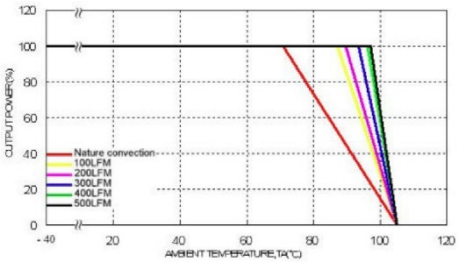
JFC48S3.3-4000 Efficiency vs. Input Voltage, Full Load



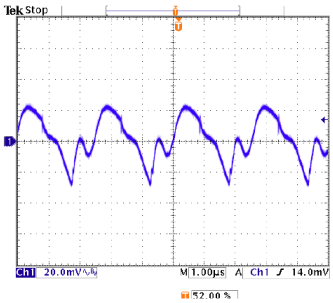
JFC48S3.3-4000 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



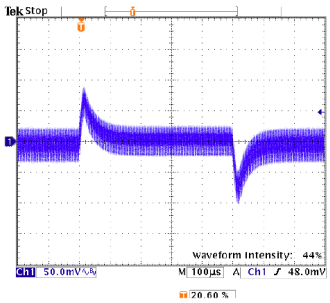
JFC48S3.3-4000 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



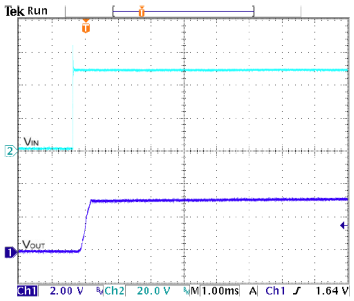
JFC48S3.3-4000 Typical Output Ripple and Noise Vin (nom); Full Load



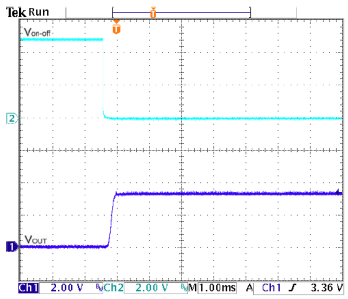
JFC48S3.3-4000 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



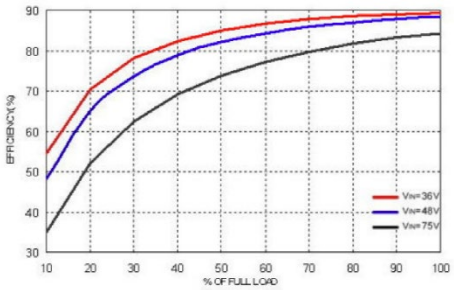
JFC48S3.3-4000 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



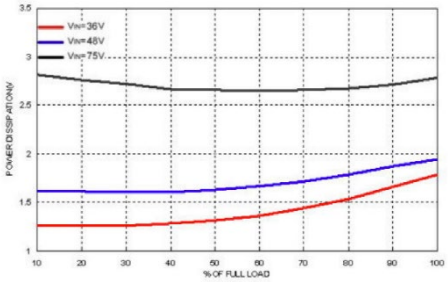
JFC48S3.3-4000 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



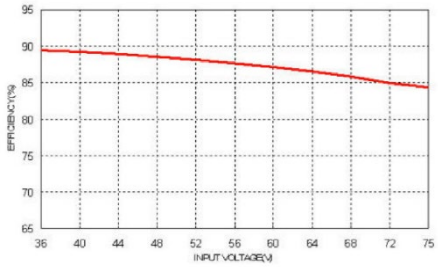
JFC48S5-3000 Efficiency vs. Output Load



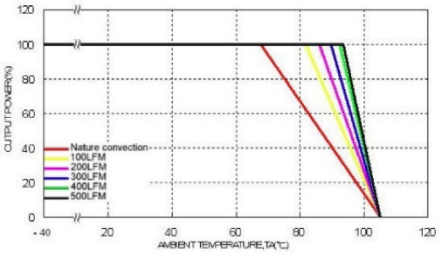
JFC48S5-3000 Power Dissipation vs. Output Load



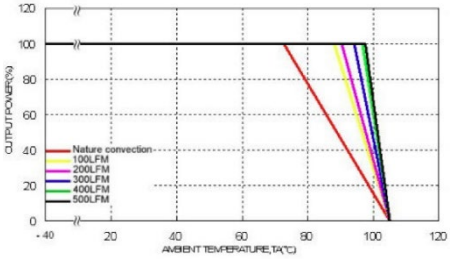
JFC48S5-3000 Efficiency vs. Input Voltage, Full Load



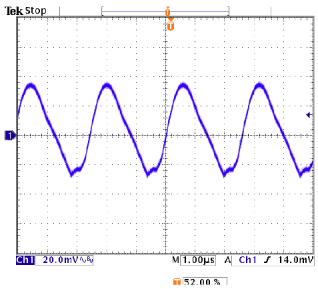
JFC48S5-3000 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



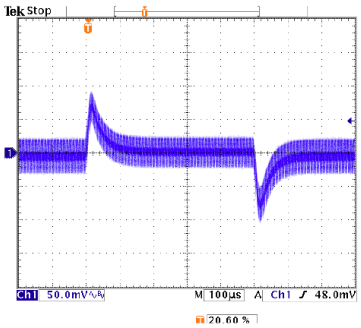
JFC48S5-3000 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



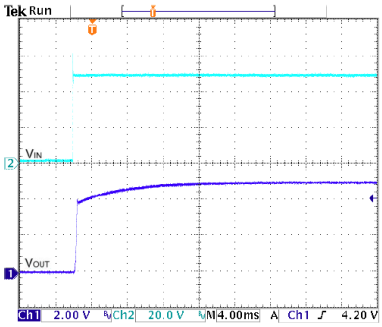
JFC48S5-3000 Typical Output Ripple and Noise Vin (nom); Full Load



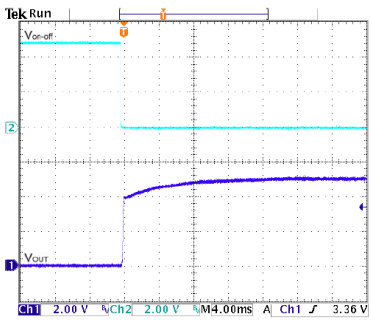
JFC48S5-3000 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



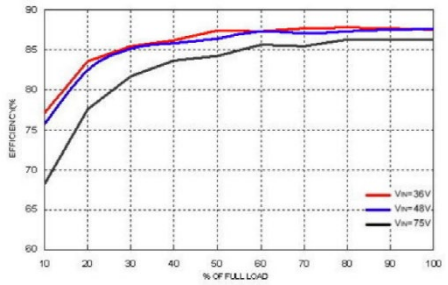
JFC48S5-3000 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



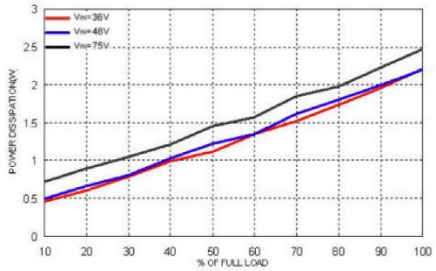
JFC48S5-3000 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



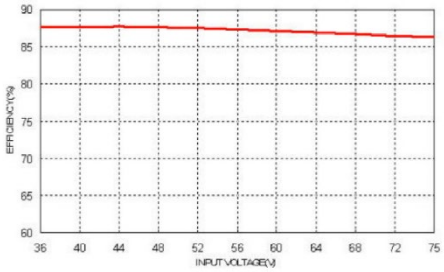
JFC48S12-1300 Efficiency vs. Output Load



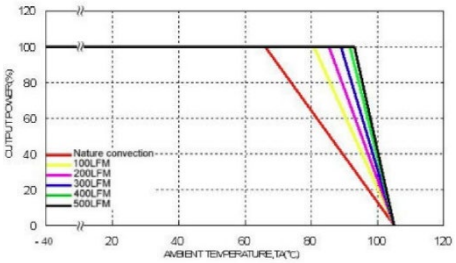
JFC48S12-1300 Power Dissipation vs. Output Load



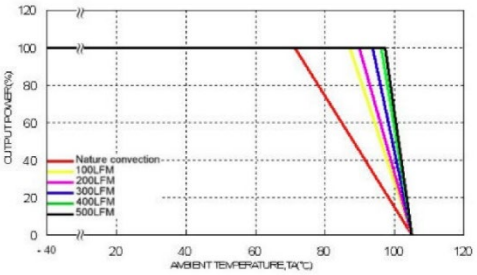
JFC48S12-1300 Efficiency vs. Input Voltage, Full Load



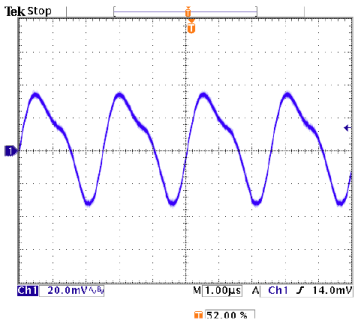
JFC48S12-1300 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



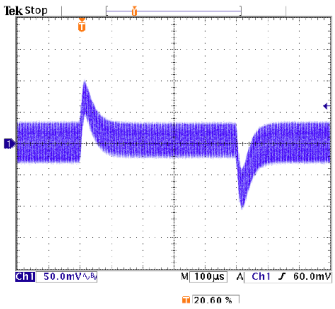
JFC48S12-1300 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



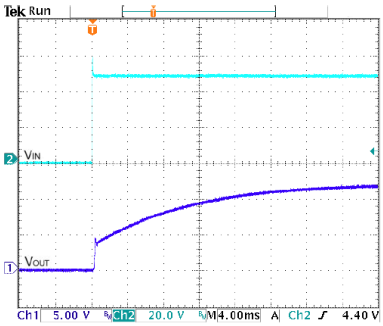
JFC48S12-1300 Typical Output Ripple and Noise Vin (nom); Full Load



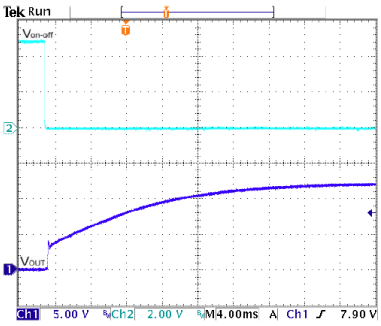
JFC48S12-1300 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



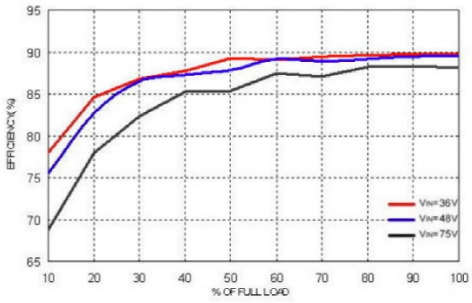
JFC48S12-1300 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



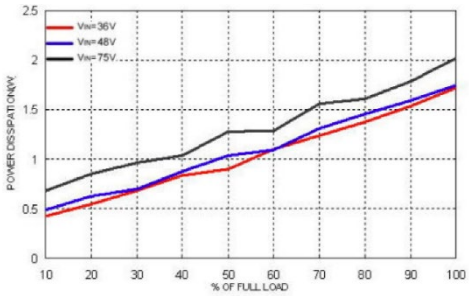
JFC48S12-1300 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



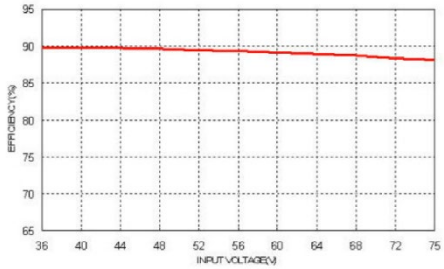
JFC48S15-1000 Efficiency vs. Output Load



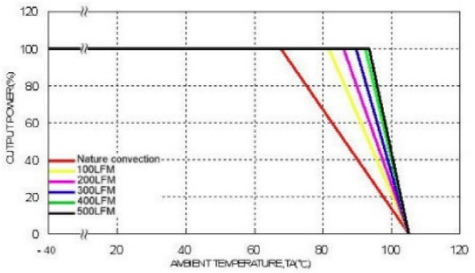
JFC48S15-1000 Power Dissipation vs. Output Load



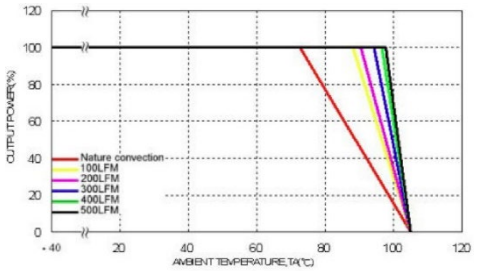
JFC48S15-1000 Efficiency vs. Input Voltage, Full Load



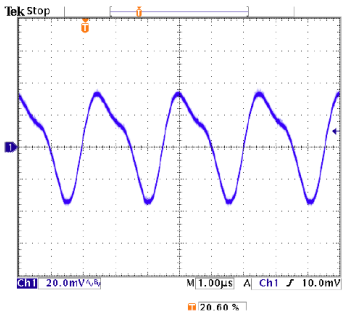
JFC48S15-1000 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



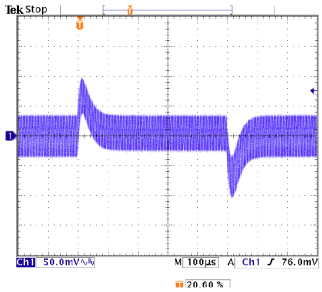
JFC48S15-1000 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



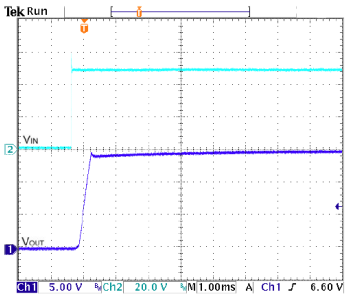
JFC48S15-1000 Typical Output Ripple and Noise Vin (nom); Full Load



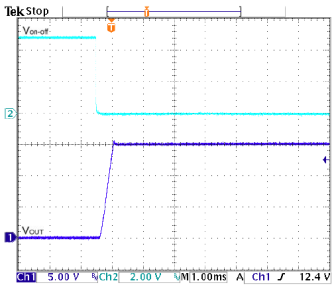
JFC48S15-1000 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



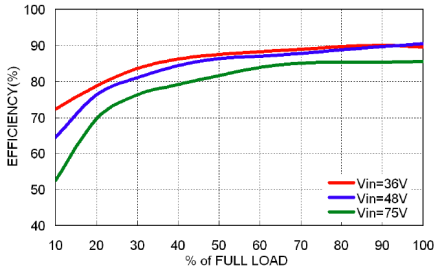
JFC48S15-1000 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



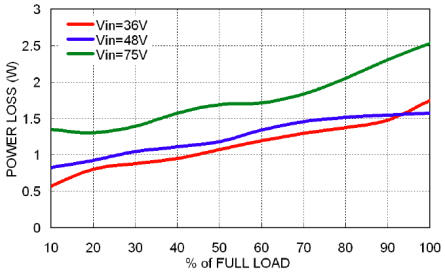
JFC48S15-1000 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



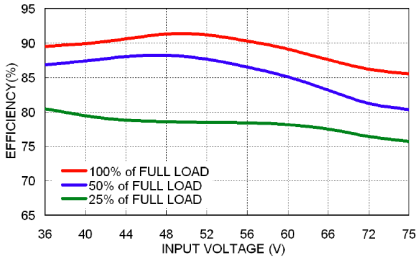
JFC48S24-625 Efficiency vs. Output Load



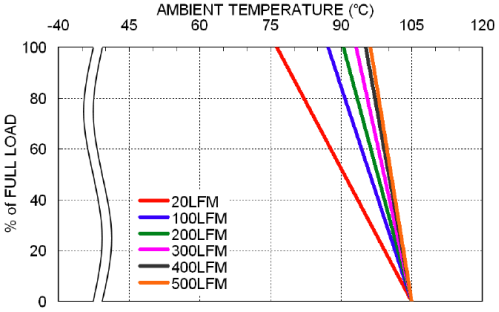
JFC48S24-625 Power Dissipation vs. Output Load



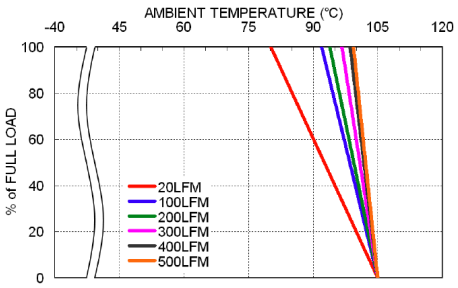
JFC48S24-625 Efficiency vs. Input Voltage, Full Load



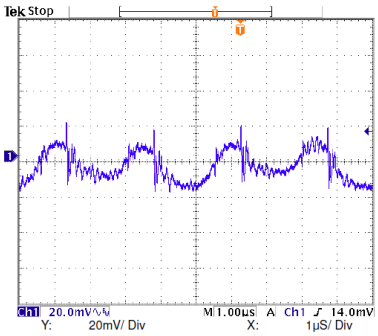
JFC48S24-625 Derating Output Load vs. Ambient Temperature and Airflow Vin (nom)



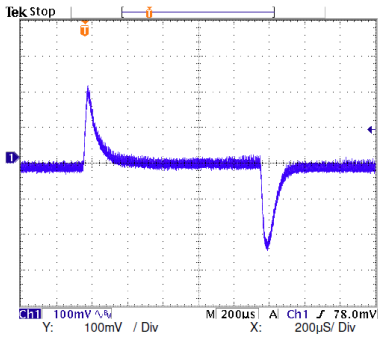
JFC48S24-625 Derating Output Load vs. Ambient Temperature with Heat-Sink and Airflow, Vin (nom)



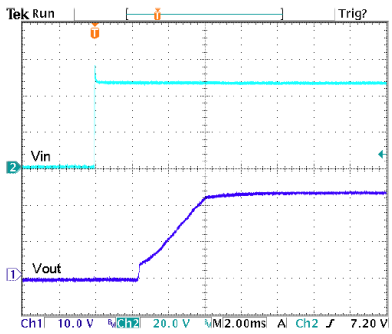
JFC48S24-625 Typical Output Ripple and Noise Vin (nom); Full Load



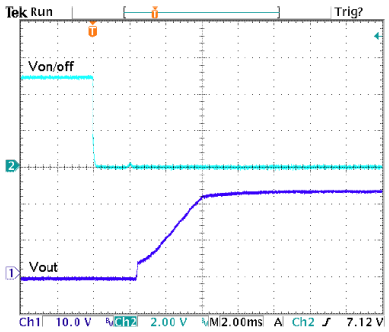
JFC48S24-625 Transient Response to Dynamic Load Change from 100% to 75% to 100% to Full Load Vin (nom)



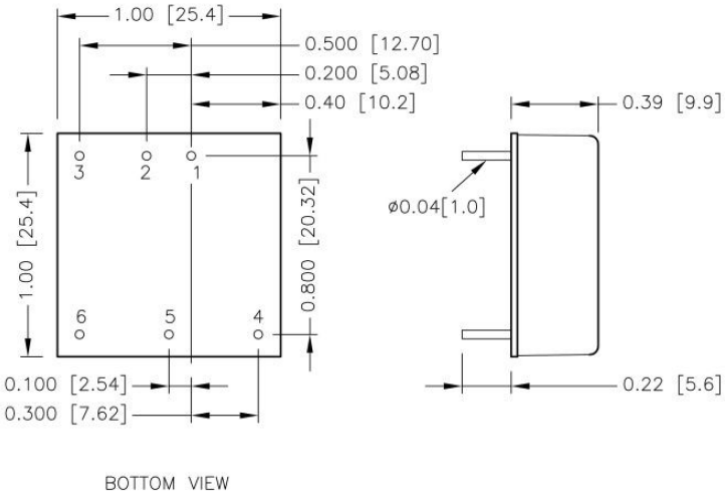
JFC48S24-625 Typical Input Start-Up and Output Rise Characteristic Vin (nom); Full Load



JFC48S24-625 Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin (nom); Full Load



MECHANICAL DRAWINGS



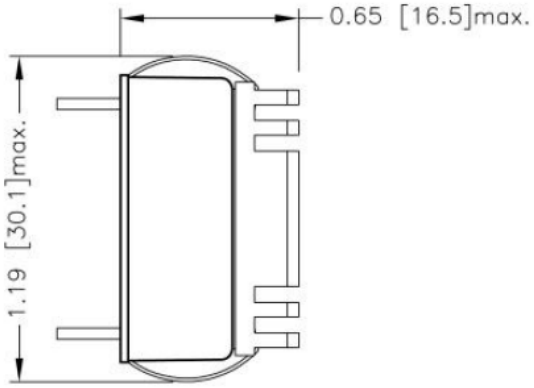
PIN Connection

PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	Ctrl	Ctrl
4	+Vout	+Vout
5	Trim	Common
6	-Vout	-Vout

1. All dimensions in inch (mm)
2. Tolerance: x.xx±0.02 (x.x±0.5)
   x.xxx±0.01 (x.xx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004 (0.1)

HEATSINK OPTIONS

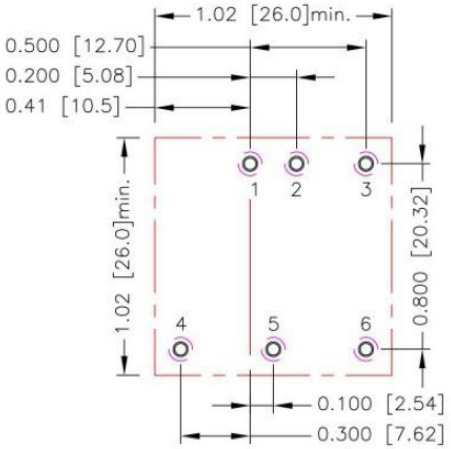
Heat-Sink with Clamp (-HC Suffix)



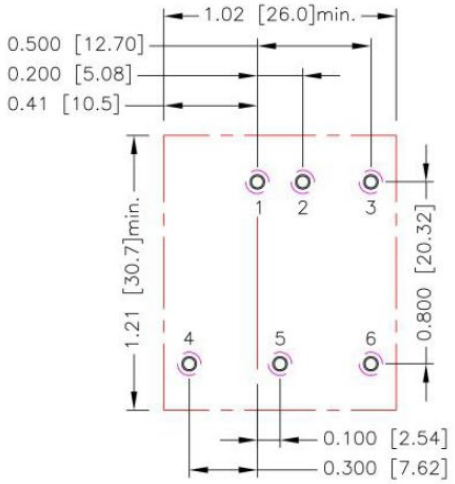
All dimensions in inch (mm)

RECOMMENDED PAD LAYOUT

Standard



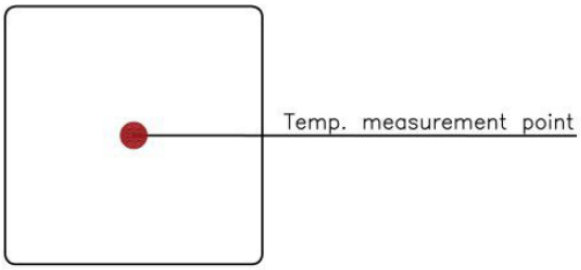
-HC



All dimensions in inch (mm)
Pad Size (Lead Free Recommendation)
Through Hole 1.2.3.4.5.6: ϕ0.051 [1.30]
Top View Pad 1.2.3.4.5.6: ϕ0.064 [1.63]
Bottom View Pad 1.2.3.4.5.6: ϕ0.102 [2.60]

THERMAL CONDSIDERATIONS

The power module operates in a variety of thermal environments.
However, sufficient cooling should be provided to help ensure reliable operation of the unit.
Heat is removed by conduction, convection, and radiation to the surrounding environment.
Proper cooling can be verified by measuring the point as the figure below.
The temperature at this location should not exceed “Maximum case temperature”.
When operating, adequate cooling must be provided to maintain the test point temperature at or below “Maximum case temperature”. You can limit this temperature to a lower value for extremely high reliability.
■ Thermal test condition with vertical direction by natural convection (20LFM).



TOP VIEW

OUTPUT VOLTAGE ADJUSTMENT

Output voltage set point adjustment allows the user to increase or decrease the output voltage set point of the module. This is accomplished by connecting an external resistor between the TRIM pin and either the +OUTPUT or –OUTPUT pins. With an external resistor between the TRIM and –OUTPUT pin, the output voltage set point increases. With an external resistor between the TRIM and +OUTPUT pin, the output voltage set point decreases. The external TRIM resistor needs to be at least 1/16W or rated power.

Trim Up Equation

$$R_U = \left[\frac{G \times L}{(V_{O,up} - L - K)} - H \right] \Omega$$

Trim Down Equation

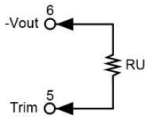
$$R_D = \left[\frac{(V_{o,down} - L) \times G}{(V_o - V_{o,down})} - H \right] \Omega$$

Trim Constants

Module	G	H	K	L
JFCxxS3.3-xxxx	5110	2050	0.8	2.5
JFCxxS5-xxxx	5110	2050	2.5	2.5
JFCxxS12-xxxx	10000	5110	9.5	2.5
JFCxxS15-xxxx	10000	5110	12.5	2.5
JFCxxS24-xxxx	56000	13000	21.5	2.5

External Output Trimming
Output can be externally trimmed by using the method shown below:

Trim Up



JFCxxS3.3-xxxx

Trim-Up (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	3.333	3.366	3.399	3.432	3.465	3.498	3.531	3.564	3.597	3.630
RU (kΩ)	385.071	191.511	126.990	94.730	75.374	62.470	53.253	46.340	40.963	36.662

JFCxxS5-xxxx

Trim-Up (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	5.050	5.100	5.150	5.200	5.250	5.300	5.350	5.400	5.450	5.500
RU (kΩ)	253.450	125.700	83.117	61.825	49.050	40.533	34.450	29.888	26.339	23.500

JFCxxS12-xxxx

Trim-Up (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	12.120	12.240	12.360	12.480	12.600	12.720	12.840	12.960	13.080	13.200
RU (kΩ)	203.223	99.057	64.334	46.973	36.557	29.612	24.652	20.932	18.038	15.723

JFCxxS15-xxxx

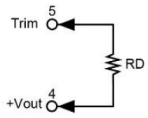
Trim-Up (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	15.150	15.300	15.450	15.600	15.750	15.900	16.050	16.200	16.350	16.500
RU (kΩ)	161.557	78.223	50.446	36.557	28.223	22.668	18.700	15.723	13.409	11.557

JFCxxS24-xxxx

Trim-Up (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	24.240	24.480	24.720	24.960	25.200	25.440	25.680	25.920	26.160	26.400
RU (kΩ)	570.333	278.667	181.444	132.833	103.667	84.222	70.333	59.917	51.815	45.333

Trim-Up (%)	11	12	13	14	15	16	17	18	19	20
Vout (V)	26.640	26.880	27.120	27.360	27.600	27.840	28.080	28.320	28.560	28.800
RU (kΩ)	40.030	35.611	31.872	28.667	25.889	23.458	21.314	19.407	17.702	16.167

Trim Down



JFCxxS3.3-xxxx

Trim-Down (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	3.267	3.234	3.201	3.168	3.135	3.102	3.069	3.036	3.003	2.970
RD (kΩ)	116.719	54.779	34.133	23.810	17.616	13.486	10.537	8.325	6.604	5.228

JFCxxS5-xxxx

Trim-Down (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	4.950	4.900	4.850	4.800	4.750	4.700	4.650	4.600	4.550	4.500
RD (kΩ)	248.340	120.590	78.007	56.715	43.940	35.423	29.340	24.778	21.229	18.390

TJFCxxS12-xxxx

Trim-Down (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	11.880	11.760	11.640	11.520	11.400	11.280	11.160	11.040	10.920	10.800
RD (kΩ)	776.557	380.723	248.779	182.807	143.223	116.834	97.985	83.848	72.853	64.057

JFCxxS15-xxxx

Trim-Down (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	14.850	14.700	14.550	14.400	14.250	14.000	13.750	13.500	13.250	13.000
RD (kΩ)	818.223	401.557	262.668	193.223	193.223	151.557	103.938	89.057	77.483	68.223

JFCxxS24-xxxx

Trim-Down (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	23.760	23.520	23.280	23.040	22.800	22.560	22.320	22.080	21.840	21.600
RD (kΩ)	4947.667	2439.333	1603.222	1185.167	934.333	767.111	647.667	558.083	488.407	423.667

MODEL NUMBER SETUP

JFC	24	S	12	-	1300	D	HC
Series Name	Input Voltage	Output Quantity	Output Voltage		Ouptut Current	Suffix	Heatsink
	12: 9~18VDC **24:** 18~36VDC **48:** 36~75VDC	**S:** Single **D:** Dual	**3.3:** 3.3VDC **5:** 5VDC/±5VDC **12:** 12VDC/±12VDC **15:** 15VDC/±15VDC **24:** 24VDC/±24VDC		**4000:** 4000mA **3000:** 3000mA **1500:** ±1500mA **1300:** 1300mA **1000:** 1000mA **625:** 625mA/±625mA **500:** ±500mA **315:** ±315mA	**Blank:** Pos. Remote ON/OFF **R:** Neg. Remote ON/OFF **D:** Without ON/OFF Pin **G:** Without ON/OFF & TRIM pin **RF:** Neg. Remote ON/OFF without TRIM pin **F:** Pos. Remote ON/OFF without TRIM pin	**Blank:** None **HC:** Heatsink with Clamps

COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001: 2015 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

Contact **Wall Industries** for further information:

Phone: ☎(603)778-2300
Toll Free: ☎(888)597-9255
Fax: ☎(603)778-9797
E-mail: sales@wallindustries.com
Web: www.wallindustries.com
Address: 37 Industrial Drive
Exeter, NH 03833

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