

# TPMS SELECTOR GUIDE

## Tire Pressure Monitoring Sensors



### TARGET APPLICATIONS

- Tire pressure monitoring systems
- Ultra-low-power wireless sensing

### IMPLEMENTATIONS

- Measures dual-axis acceleration to support location of wheel on the vehicle
- Measures temperature
- Measures battery voltage
- Bi-directional wireless communication
- Measures tire pressure for passenger, light-duty or heavy-duty vehicles

### NXP TPMS SENSORS

NXP's tire pressure monitoring sensors (TPMS) has a fully integrated 4 x 4 mm and 7 x 7 mm package footprint. These are significantly smaller than the previous generation of QFN packages on the market.

These devices provide:

- Low transmitting power consumption (less than 7 mA I<sub>dd</sub>)
- Large customer memory size (~8-15 kB)
- Dual-axis accelerometer architecture

### NXP'S TPMS SOLUTION INTEGRATES:

- 8-bit MCU
- Pressure sensor
- XZ-axis or Z-axis accelerometer
- 125 kHz LF receiver
- 315–434 MHz RF transmitter

NXP's portfolio can support cars, light and heavy trucks as well as buses. These TPMS markets are mainly regulation driven with new mandates, resulting in significant growth. NXP continues to produce TPMS products that meet the latest mandates to accommodate customer requirements.

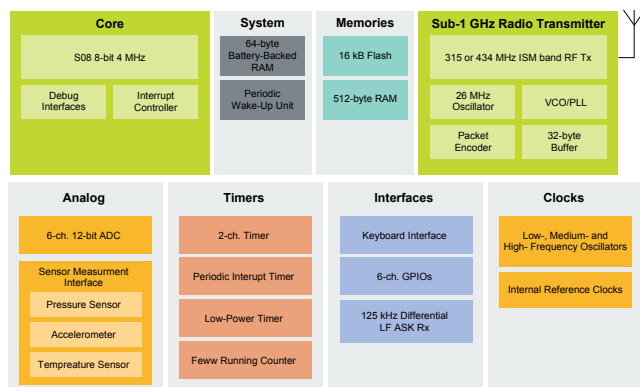
### PRODUCT DIFFERENTIATION

| Features                                                               | Benefits                                                                          |
|------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Small, fully integrated package size                                   | Enables small module design for lighter weight and space-constrained applications |
| Dual-axis XZ inertial sensor                                           | Enables easier localization capability                                            |
| Same package height and similar firmware as QFN 9 x 9 solutions        | Easy transition from between solutions                                            |
| 8–15 kB customer memory/capability of interfacing with external memory | Flexibility of software development and time to market                            |
| Low RF power consumption                                               | Long battery life                                                                 |
| High production capacity                                               | Secured supply and short lead time                                                |

## NTM88 SPECIFICATIONS

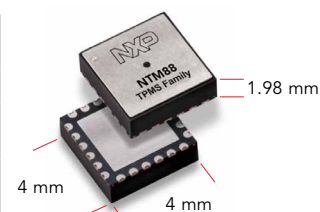
| Part number                                                                                                                               | Pressure Range (kPa) | Pressure Accuracy (-40°C ≤ Ta ≤ 105°C) | Temperature Range (°C) | Temperature Accuracy (-20°C ≤ Ta ≤ 70°C) | Z-axis Accelerometer Range (g) | Z-axis Accelerometer Accuracy (-40°C ≤ Ta ≤ 125°C) | X-axis Accelerometer Range (g) | X-axis Accelerometer Accuracy (-40°C ≤ Ta ≤ +125°C) |
|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------------------------|------------------------|------------------------------------------|--------------------------------|----------------------------------------------------|--------------------------------|-----------------------------------------------------|
| Passenger Car and Light Duty Pressure Range with Single X-axis Accelerometer                                                              |                      |                                        |                        |                                          |                                |                                                    |                                |                                                     |
| NTM88H055T1                                                                                                                               | 90 to 930            | ±5                                     | -40 to +125            | ±3                                       | NA                             |                                                    | -80 to +90                     | ±3 @ 0g                                             |
| NTM88H065T1                                                                                                                               |                      |                                        |                        |                                          |                                |                                                    | -360 to +400                   |                                                     |
| NTM88H075T1                                                                                                                               |                      |                                        |                        |                                          |                                |                                                    | -120 to +520                   |                                                     |
| Passenger Car and Light Duty Pressure Range with Dual XZ-axis Accelerometer – Under Development, contact sales representative for samples |                      |                                        |                        |                                          |                                |                                                    |                                |                                                     |
| NTM88H135T1                                                                                                                               | 90 to 930            | ±5                                     | -40 to +125            | ±3                                       | -360 to +400                   | ±3 @ 0g                                            | -80 to +90                     | ±3 @ 0g                                             |
| NTM88H145T1                                                                                                                               |                      |                                        |                        |                                          | -80 to +90                     |                                                    | -360 to +400                   |                                                     |
| NTM88H155T1                                                                                                                               |                      |                                        |                        |                                          | -360 to +400                   |                                                    | -360 to +400                   |                                                     |
| Medium Duty Pressure Range with Dual XZ-axis Accelerometer – Under Development, contact sales representative for samples                  |                      |                                        |                        |                                          |                                |                                                    |                                |                                                     |
| NTM88J135T1                                                                                                                               | 90 to 1110           | 90 to 700kPa: ±5<br>700 to 1110kPa: ±8 | -40 to +125            | ±3                                       | -360 to +400                   | ±3 @ 0g                                            | -80 to +90                     | ±3 @ 0g                                             |
| NTM88J145T1                                                                                                                               |                      |                                        |                        |                                          | -80 to +90                     |                                                    | -360 to +400                   |                                                     |
| NTM88J155T1                                                                                                                               |                      |                                        |                        |                                          | -360 to +400                   |                                                    | -360 to +400                   |                                                     |

## NTM88 TPMS FAMILY BLOCK DIAGRAM



## NTM88 ATTRIBUTES

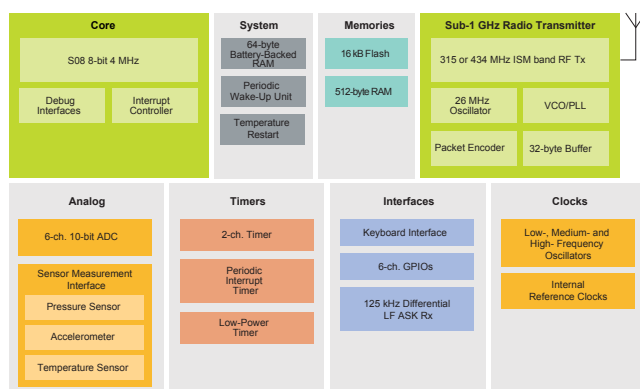
|                                                   |                   |
|---------------------------------------------------|-------------------|
| Voltage Measurement Range                         | 1.8 V to 3.6 V    |
| Voltage Resolution (8-bit)                        | 10 mV/LSB         |
| Voltage Accuracy (>2.1 V supply)                  | ± 100 mV          |
| Temperature Measurement Range Run Mode            | -40 °C to +125 °C |
| Temperature Resolution (8-bit unsigned)           | 1 °C/LSB          |
| Temperature Offset Accuracy (-20 °C ≤ Ta ≤ 70 °C) | ± 3 °C            |



## FXTH87 SPECIFICATIONS

| Part number               | Pressure Range (kPa) | Pressure Accuracy (-40 °C ≤ Ta ≤ 85 °C) | Temperature Range (°C) | Temperature Accuracy (-20 °C ≤ Ta ≤ 70 °C) | Z-axis Accelerometer Range (g) | Z-axis Accelerometer Accuracy (-40 °C ≤ Ta ≤ 125 °C) | X-axis Accelerometer Range (g) | X-axis Accelerometer Accuracy (-40 °C ≤ Ta ≤ +125 °C) |
|---------------------------|----------------------|-----------------------------------------|------------------------|--------------------------------------------|--------------------------------|------------------------------------------------------|--------------------------------|-------------------------------------------------------|
| Standard Tolerances       |                      |                                         |                        |                                            |                                |                                                      |                                |                                                       |
| FXTH87EH11DT1             | 100-900              | ± 5 kPa from 100 to 900 kPa             | -40 to 125             | ± 3 °C                                     | -215 to 305                    | ± 5g                                                 | -80 to 90                      | ± 4g                                                  |
| Precision Tolerances      |                      |                                         |                        |                                            |                                |                                                      |                                |                                                       |
| FXTH87EH116T1             | 100-900              | ± 5 kPa from 100 to 900 kPa             | -40 to 125             | ± 3 °C                                     | -215 to 305                    | ± 3g                                                 | -80 to 90                      | ± 3g                                                  |
| Precision Tolerances      |                      |                                         |                        |                                            |                                |                                                      |                                |                                                       |
| FXTH8715116T1             | 100-1500             | ± 20 kPa from 100 to 1500 kPa           | -40 to 125             | ± 3 °C                                     | -215 to 305                    | ± 3g                                                 | -80 to 90                      | ± 3g                                                  |
| FXTH8718116T1             | 100-1800             | ± 25 kPa from 100 to 1500 kPa           |                        |                                            |                                |                                                      |                                |                                                       |
| High Precision Tolerances |                      |                                         |                        |                                            |                                |                                                      |                                |                                                       |
| FXTH8715117T1             | 100-1500             | ± 17 kPa                                | -40 to 125             | ± 3 °C                                     | -210 to 300                    | ± 3g                                                 | -80 to 90                      | ± 3g                                                  |

## FXTH87 TPMS FAMILY BLOCK DIAGRAM



## FXTH87 ATTRIBUTES

|                                                   |                   |
|---------------------------------------------------|-------------------|
| Voltage Measurement Range                         | 1.8 V to 3.6 V    |
| Voltage Resolution (8-bit)                        | 10 mV/LSB         |
| Voltage Accuracy (>2.1 V supply)                  | ± 100 mV          |
| Temperature Measurement Range Run Mode            | -40 °C to +125 °C |
| Temperature Resolution (8-bit unsigned)           | 1 °C/LSB          |
| Temperature Offset Accuracy (-20 °C ≤ TA ≤ 70 °C) | ± 3 °C            |

