

**100V N-Channel Enhancement Mode MOSFET**

|                |              |                            |               |
|----------------|--------------|----------------------------|---------------|
| <b>Voltage</b> | <b>100 V</b> | <b>R<sub>DS(ON)</sub></b>  | <b>7.4 mΩ</b> |
| <b>Current</b> | <b>64 A</b>  | <b>Q<sub>G</sub> (TYP)</b> | <b>24 nC</b>  |

**Feature**

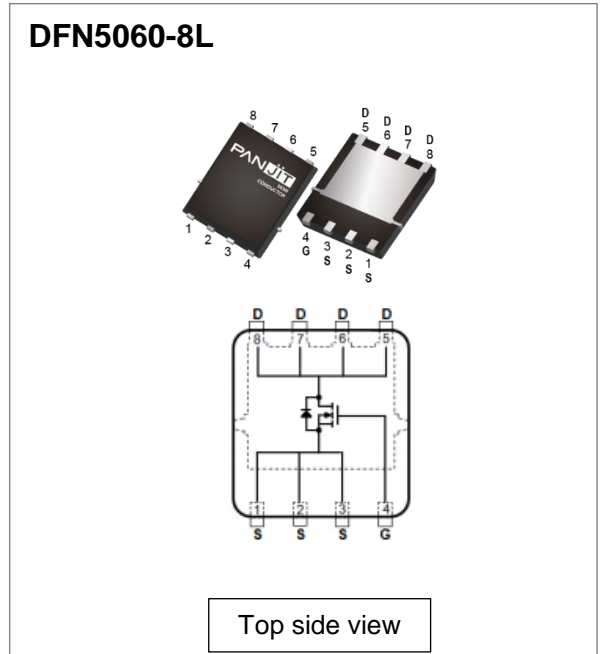
- R<sub>DS(ON)</sub> < 7.4 mΩ at V<sub>GS</sub> = 10 V, I<sub>D</sub> = 40 A
- R<sub>DS(ON)</sub> < 12.0 mΩ at V<sub>GS</sub> = 6 V, I<sub>D</sub> = 20 A
- High switching speed
- Low reverse transfer capacitance
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard
- 100% UIS / Rg test in mass production

**Mechanical Data**

- Case: DFN5060-8L Package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.08 grams

**Application**

- PD Charger / Adapter / Home Appliance.



**Absolute Maximum Ratings** (T<sub>A</sub> = 25 °C unless otherwise specified)

| PARAMETER  |                        | SYMBOL                            | LIMIT   | UNITS |
|--|------------------------|-----------------------------------|---------|-------|
| Drain-Source Voltage                             |                        | V <sub>DS</sub>                   | 100     | V     |
| Gate-Source Voltage                              |                        | V <sub>GS</sub>                   | ±20     |       |
| Continuous Drain Current (Note 3)                | T <sub>C</sub> =25 °C  | I <sub>D</sub>                    | 64      | A     |
|  | T <sub>C</sub> =100 °C |                                   | 45      |       |
| Pulsed Drain Current                             |                        | I <sub>DM</sub>                   | 268     | A     |
| Single Pulse Avalanche Current (Note 5)          |                        | I <sub>AS</sub>                   | 35      | A     |
| Single Pulse Avalanche Energy (Note 5)           |                        | E <sub>AS</sub>                   | 178     | mJ    |
| Power Dissipation                                | T <sub>C</sub> =25 °C  | P <sub>D</sub>                    | 71      | W     |
|  | T <sub>C</sub> =100 °C |                                   | 35      |       |
| Operating Junction and Storage Temperature Range |                        | T <sub>J</sub> , T <sub>STG</sub> | -55~175 | °C    |

**Thermal Characteristics**

| PARAMETER          | SYMBOL                       | VALUES           |      |      | UNITS |      |
|--------------------|------------------------------|------------------|------|------|-------|------|
|                    |                              | MIN.             | TYP. | MAX. |       |      |
| Thermal Resistance | Junction-to-Case (Bottom)    | R <sub>θJC</sub> | -    | 1.4  | 2.1   | °C/W |
|                    | Junction-to-Ambient (Note 4) | R <sub>θJA</sub> | -    | -    | 50    | °C/W |

## Electrical Characteristics (T<sub>A</sub> = 25 °C unless otherwise specified)

| PARAMETER                                 | SYMBOL               | TEST CONDITION   | MIN. | TYP. | MAX. | UNITS |
|---|----------------------|--|------|------|------|-------|
| <b>Static Characteristics</b>             |                      |  |      |      |      |       |
| Drain-Source Breakdown Voltage            | BV <sub>DSS</sub>    | V <sub>GS</sub> =0 V, I <sub>D</sub> =250 μA   | 100  | -    | -    | V     |
| Gate Threshold Voltage                    | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =145 μA  | 1.8  | 2.8  | 3.8  |       |
| Drain-Source On-State Resistance (Note 1) | R <sub>DS(on)</sub>  | V <sub>GS</sub> =10 V, I <sub>D</sub> =40 A  | -    | 6.6  | 7.4  | mΩ    |
|   |                      | V <sub>GS</sub> =6 V, I <sub>D</sub> =20 A   | -    | 9.3  | 12.0 |       |
| Zero Gate Voltage Drain Current           | I <sub>DSS</sub>     | V <sub>DS</sub> =100 V, V <sub>GS</sub> =0 V   | -    | -    | 1    | μA    |
| Gate-Source Leakage Current               | I <sub>GSS</sub>     | V <sub>GS</sub> =±20 V, V <sub>DS</sub> =0 V   | -    | -    | ±100 | nA    |
| Transfer Characteristics (Note 1)         | g <sub>fs</sub>      | V <sub>DS</sub> =10 V, I <sub>D</sub> =40 A  | -    | 72   | -    | S     |
| <b>Dynamic Characteristics (Note 6)</b>   |                      |  |      |      |      |       |
| Total Gate Charge                         | Q <sub>g</sub>       | V <sub>DS</sub> =50 V, I <sub>D</sub> =40 A, V <sub>GS</sub> =10 V                                 | -    | 24   | 31   | nC    |
| Gate-Source Charge                        | Q <sub>gs</sub>      |  | -    | 9.2  | -    |       |
| Gate-Drain Charge                         | Q <sub>gd</sub>      |  | -    | 2.9  | -    |       |
| Gate Plateau Voltage                      | V <sub>plateau</sub> |  | -    | 5.0  | -    | V     |
| Input Capacitance                         | C <sub>iss</sub>     | V <sub>DS</sub> =50 V, V <sub>GS</sub> =0 V, f=250 kHz   | -    | 1650 | 2150 | pF    |
| Output Capacitance                        | C <sub>oss</sub>     |  | -    | 705  | 920  |       |
| Reverse Transfer Capacitance              | C <sub>rss</sub>     |  | -    | 16   | -    |       |
| Output Charge                             | Q <sub>oss</sub>     | V <sub>DS</sub> =50 V, V <sub>GS</sub> =0 V  | -    | 43   | 56   | nC    |
| Turn-On Delay Time                        | t <sub>d(on)</sub>   | V <sub>DD</sub> =50 V, I <sub>D</sub> =40 A, V <sub>GS</sub> =10 V, R <sub>G</sub> =3.0 Ω (Note 2) | -    | 7.7  | -    | ns    |
| Rise Time                                 | t <sub>r</sub>       |  | -    | 4.8  | -    |       |
| Turn-Off Delay Time                       | t <sub>d(off)</sub>  |  | -    | 13.4 | -    |       |
| Fall Time                                 | t <sub>f</sub>       |  | -    | 5.3  | -    |       |
| Gate Resistance                           | R <sub>g</sub>       | f =1.0 MHz   | -    | 1.1  | 2.2  | Ω     |
| <b>Drain-Source Diode</b>                 |                      |  |      |      |      |       |
| Diode Forward Voltage                     | V <sub>SD</sub>      | I <sub>S</sub> =40 A, V <sub>GS</sub> =0 V   | -    | 0.9  | 1.2  | V     |
| Reverse Recovery Charge                   | Q <sub>rr</sub>      | I <sub>F</sub> =40 A, V <sub>DD</sub> =50 V, di/dt=100 A/μs  | -    | 41   | -    | nC    |
| Reverse Recovery Time                     | T <sub>rr</sub>      |  | -    | 38   | -    | ns    |

### NOTES :

1. Pulse width ≤ 300 μs, Duty cycle ≤ 2 %.
2. Essentially independent of operating temperature typical characteristics.
3. The maximum drain current calculated by maximum junction temperature and thermal impedance. It can be varied by application and environment.
4. R<sub>θJA</sub> is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. Mounted on a 1 inch<sup>2</sup> with 2oz.square pad of copper.
5. E<sub>AS</sub> is calculated based on the condition of L = 1.0 mH, I<sub>AS</sub> = 18.9 A, V<sub>DD</sub> = 50 V, V<sub>GS</sub> = 10 V. 100% test at L = 0.1 mH, I<sub>AS</sub> = 35 A in production.
6. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTIC CURVES

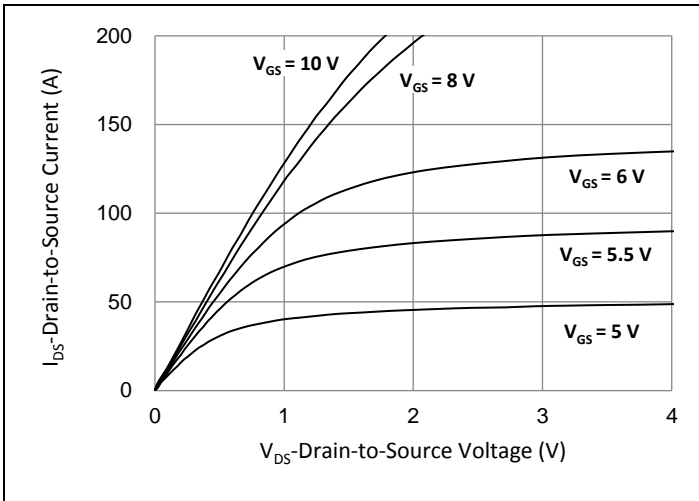


Fig.1 Output Characteristics

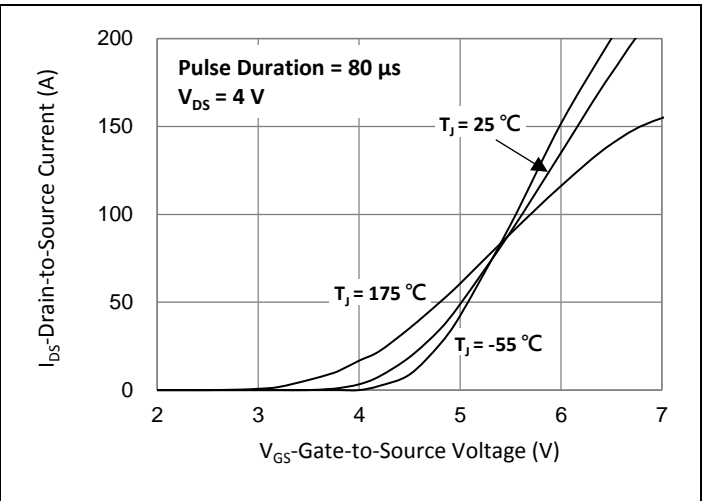


Fig.2 Transfer Characteristics

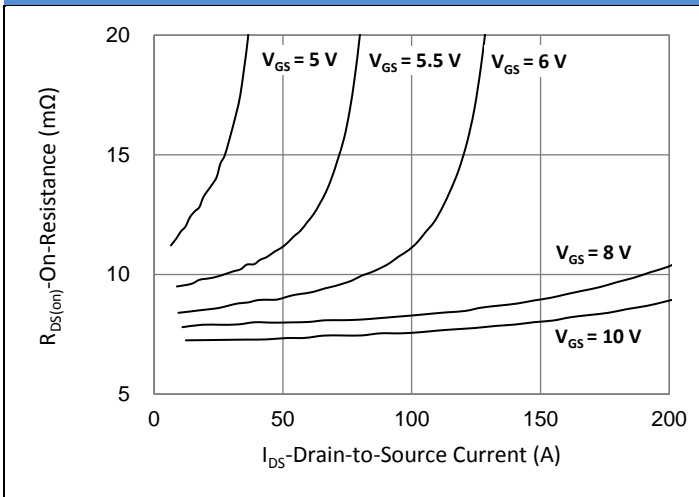


Fig.3 On-Resistance vs. Drain Current

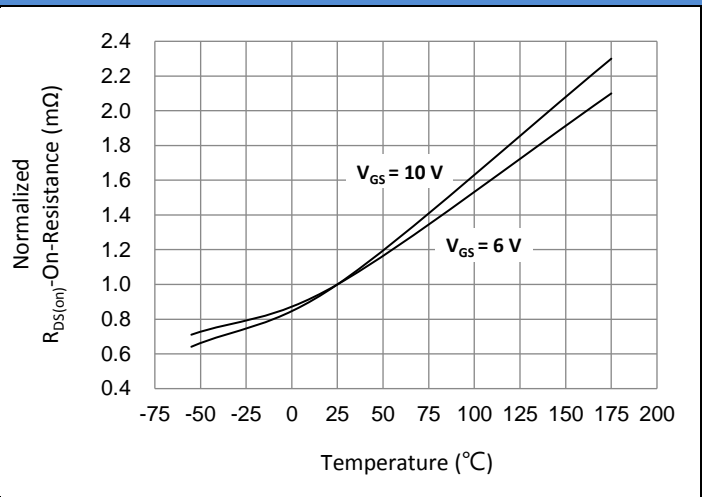


Fig.4 On-Resistance vs. Junction temperature

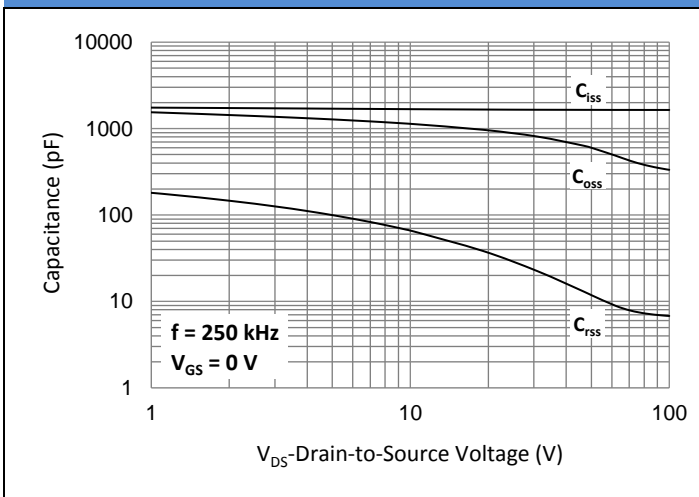


Fig.5 Capacitance vs. Drain-Source Voltage

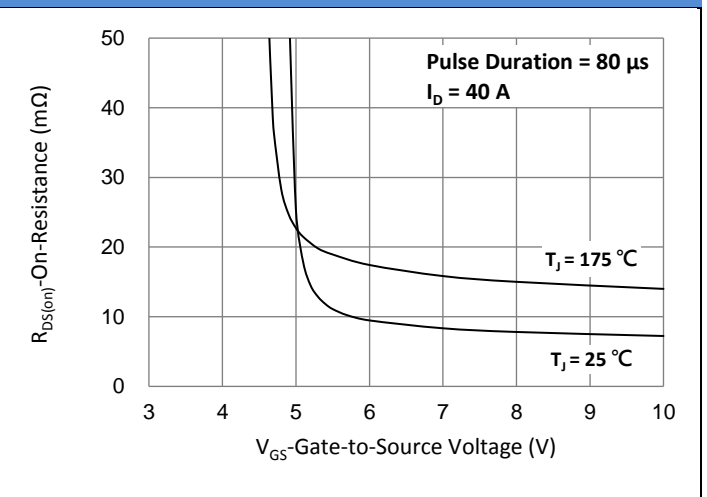


Fig.6 On-Resistance vs. Gate-Source Voltage

TYPICAL CHARACTERISTIC CURVES

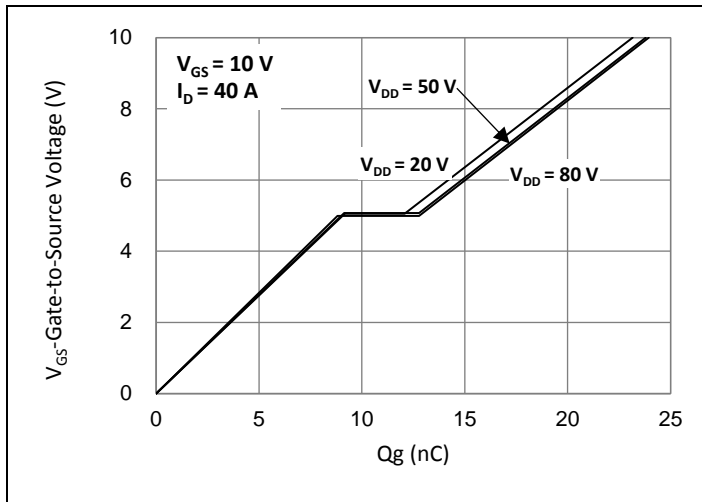


Fig.7 Gate-Charge Characteristics

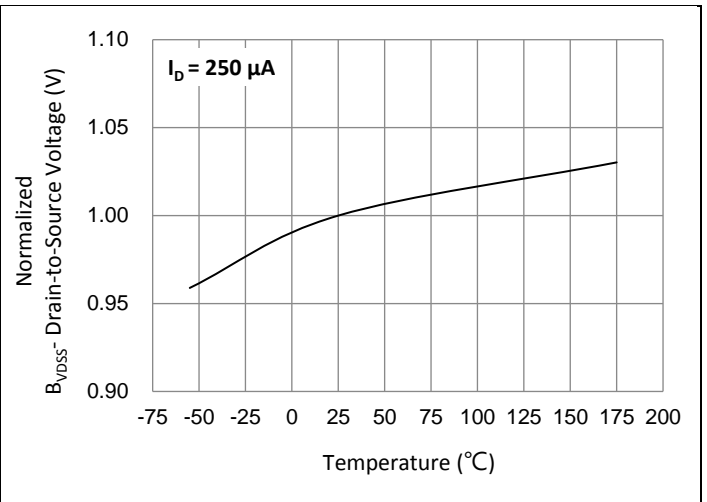


Fig.8 Breakdown Voltage Variation vs. Temperature

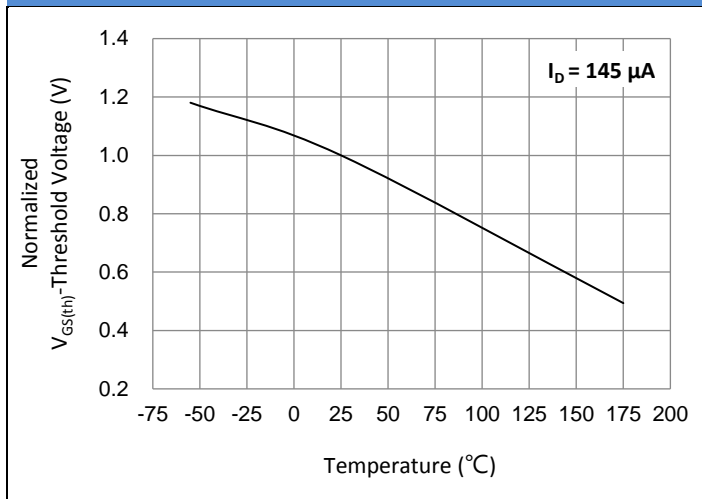


Fig.9 Threshold Voltage Variation with Temperature

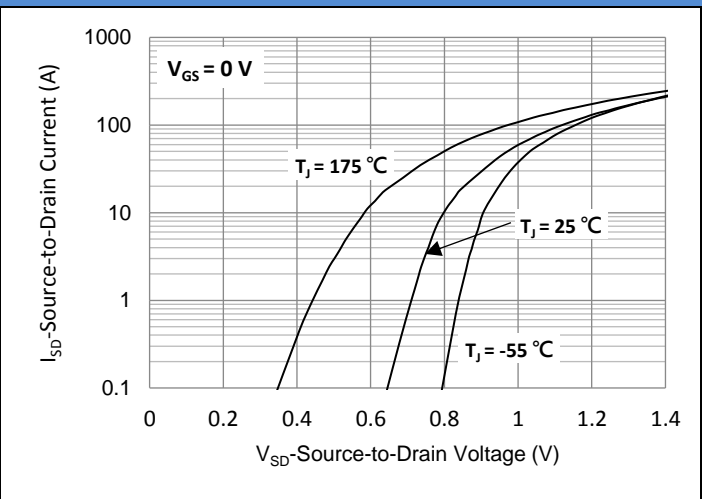


Fig.10 Source-Drain Diode Forward Voltage

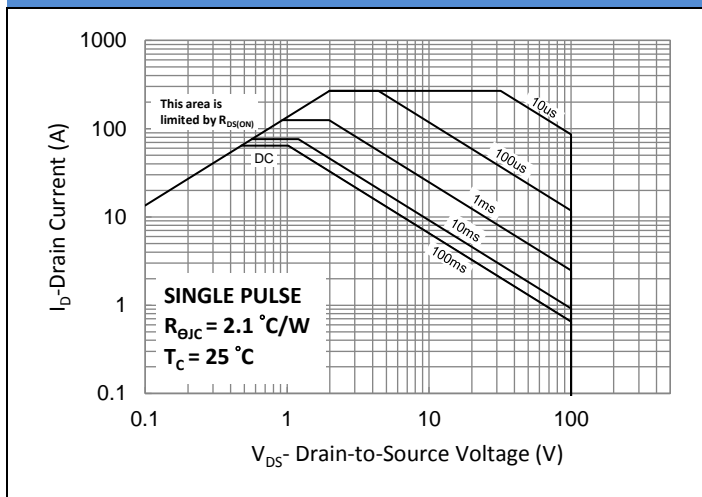


Fig.11 Maximum Safe Operating Area

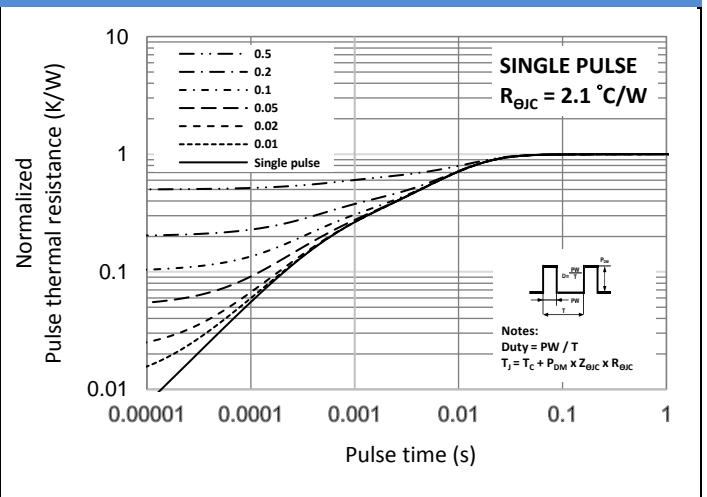
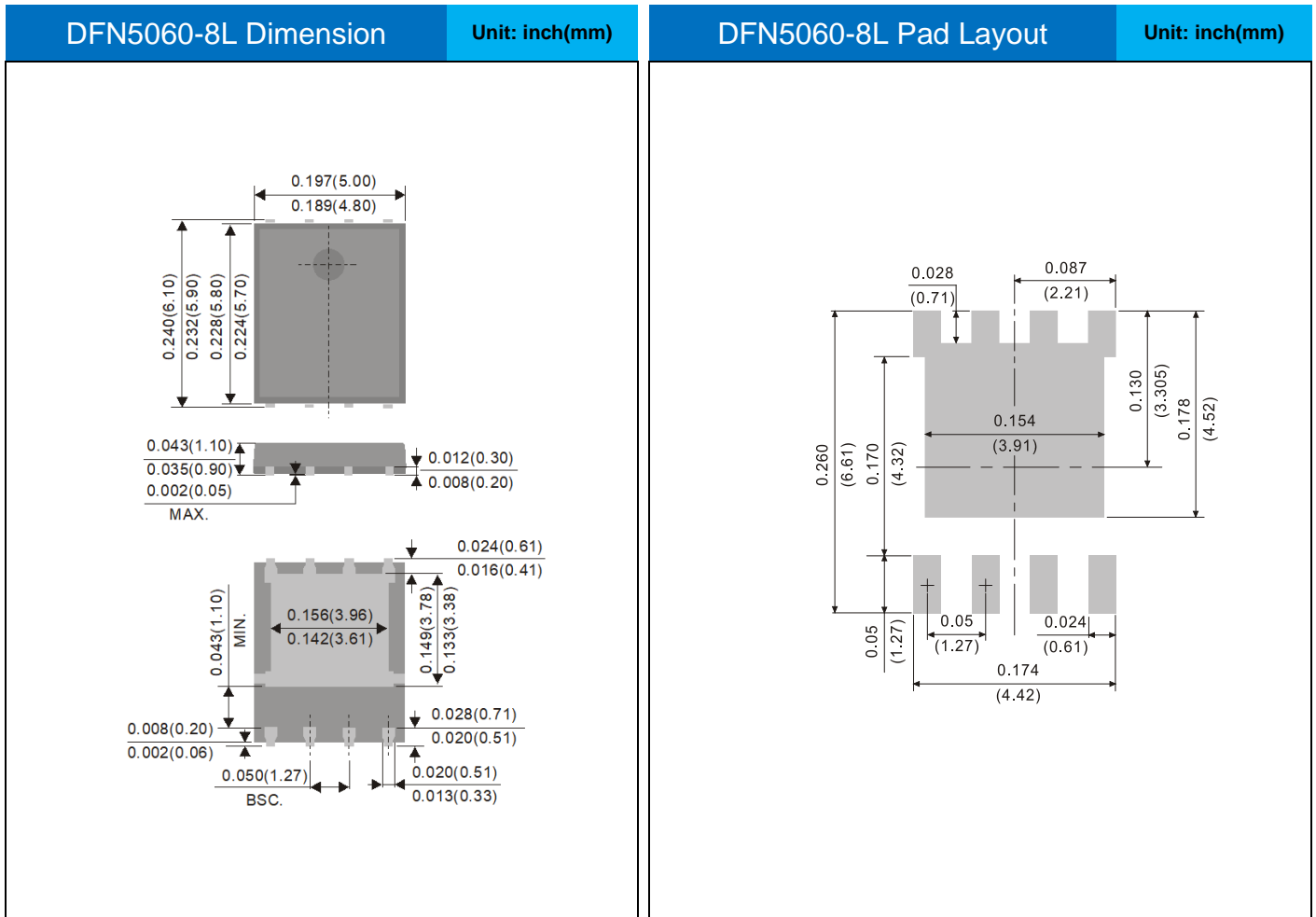


Fig.12 Normalized Transient Thermal Impedance

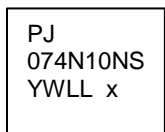
**Product and Packing Information**

| Part No.       | Package Type | Packing Type       | Marking  |
|----------------|--------------|--------------------|----------|
| PSMQC074N10NS2 | DFN5060-8L   | 3000pcs / 13" reel | 074N10NS |

**Packaging Information & Mounting Pad Layout**



**Marking Diagram**



- Y** = Year Code
- W** = Week Code (A~Z)
- LL** = Lot Code (00~99)
- x** = Production Line Code

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