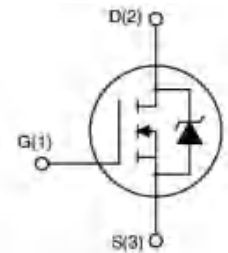


APG032N04G

N-Channel Enhancement Mosfet

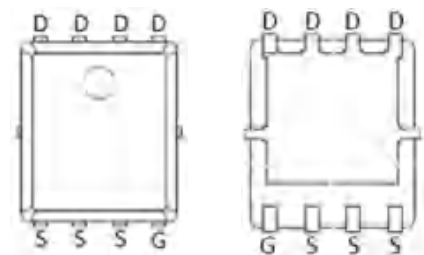
Feature

- 40V,100A
 $R_{DS(ON)} < 3.2m\Omega @ V_{GS}=10V$ (TYP:2.7m Ω)
 $R_{DS(ON)} < 4.6m\Omega @ V_{GS}=4.5V$ (TYP:3.8m Ω)
- Split Gate Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge



Application

- PWM applications
- Load Switch
- Power management



PDFN5X6

Package Marking and Ordering Information

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity (PCS) |
|----------------|------------|----------------|-----------|------------|----------------|
| G032N04 | APG032N04G | PDFN5X6 | 13 inch | - | 5000 |

ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|--|-----------------|-----------|---------------------------|
| Drain-Source Voltage | V_{DS} | 40 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ($T_a=25^\circ\text{C}$) | I_D | 100 | A |
| Continuous Drain Current ($T_a=100^\circ\text{C}$) | I_D | 62 | A |
| Pulsed Drain Current ⁽¹⁾ | I_{DM} | 420 | A |
| Single Pulsed Avalanche Energy ⁽²⁾ | E_{AS} | 100 | mJ |
| Power Dissipation | P_D | 62.5 | W |
| Thermal Resistance from Junction to Case | $R_{\theta JC}$ | 2 | $^\circ\text{C}/\text{W}$ |
| Junction Temperature | T_J | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{STG} | -55~ +150 | $^\circ\text{C}$ |

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25°C unless otherwise noted)

| Parameter | Symbol | Test Condition | Min | Type | Max | Unit |
|---|----------------------|--|-----|------|------|------|
| Static Characteristics | | | | | | |
| Drain-source breakdown voltage | V _{(BR)DSS} | V _{GS} = 0V, I _D =250μA | 40 | - | - | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} =40V, V _{GS} = 0V | - | - | 1 | μA |
| Gate-body leakage current | I _{GSS} | V _{GS} =±20V, V _{DS} = 0V | - | - | ±100 | nA |
| Gate threshold voltage ⁽³⁾ | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250μA | 1.2 | 1.7 | 2.2 | V |
| Drain-source on-resistance ⁽³⁾ | R _{DS(on)} | V _{GS} =10V, I _D =30A | - | 2.7 | 3.2 | mΩ |
| | | V _{GS} =4.5V, I _D =20A | - | 3.8 | 4.6 | |
| Gate Resistance | R _g | V _{DS} =V _{GS} =0V, f =1MHz | - | 3.8 | - | Ω |
| Dynamic characteristics | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} =20V, V _{GS} =0V, f =1MHz | - | 1827 | - | pF |
| Output Capacitance | C _{oss} | | - | 623 | - | |
| Reverse Transfer Capacitance | C _{rss} | | - | 22 | - | |
| Switching characteristics | | | | | | |
| Turn-on delay time | t _{d(on)} | V _{DD} =20V, I _D =20A, V _{GS} =10V, R _G =6Ω | - | 6.2 | - | ns |
| Turn-on rise time | t _r | | - | 27.4 | - | |
| Turn-off delay time | t _{d(off)} | | - | 39.8 | - | |
| Turn-off fall time | t _f | | - | 16.6 | - | |
| Total Gate Charge | Q _g | V _{DS} =20V, I _D =20A, V _{GS} =10V | - | 28.3 | - | nC |
| Gate-Source Charge | Q _{gs} | | - | 6.17 | - | |
| Gate-Drain Charge | Q _{gd} | | - | 4.55 | - | |
| Reverse Recovery Chrage | Q _{rr} | I _F =20A, di/dt=100A/us | | 20 | | nC |
| Reverse Recovery Time | T _{rr} | I _F =20A, di/dt=100A/us | | 36 | | ns |
| Source-Drain Diode characteristics | | | | | | |
| Diode Forward voltage ⁽³⁾ | V _{SD} | V _{GS} =0V, I _S =50A | - | - | 1.2 | V |
| Diode Forward current ⁽⁴⁾ | I _S | | - | - | 70 | A |

Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition: T_J=25°C, V_{DD}=20V, R_G=25 Ω, L=0.5Mh, I_{AS}=20A
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board, t≤10 sec

■ Test circuits and waveforms

Figure A: Gate Charge Test Circuit & Waveforms

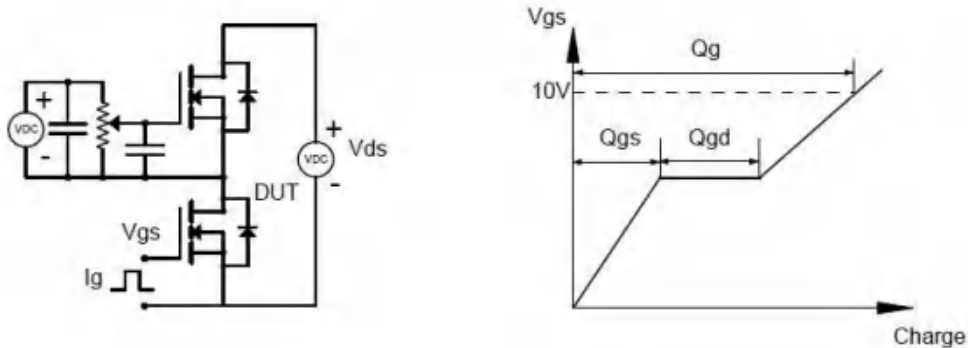


Figure B: Resistive Switching Test Circuit & Waveforms

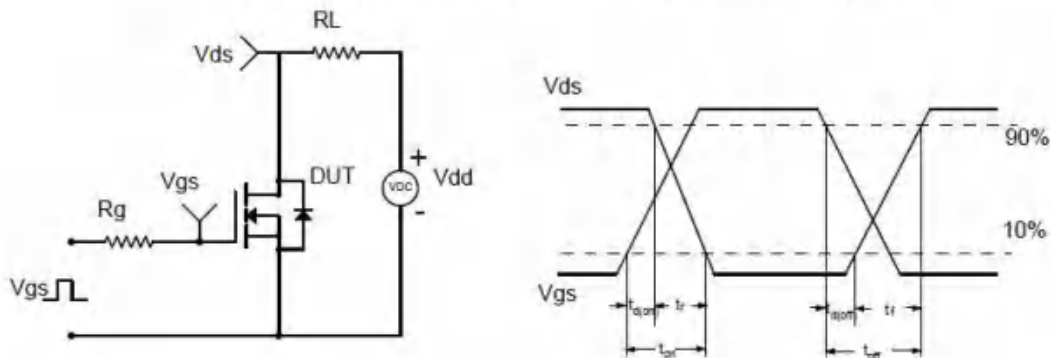


Figure C: Unclamped Inductive Switching (UIS) Test

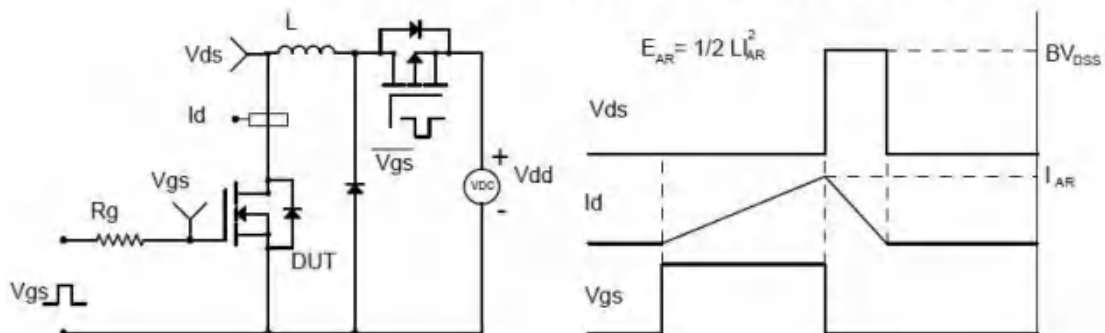
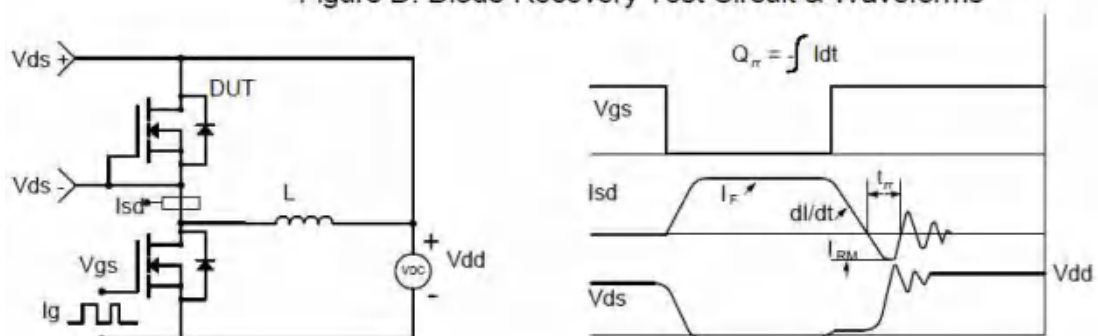


Figure D: Diode Recovery Test Circuit & Waveforms



Electrical Characteristics Diagrams

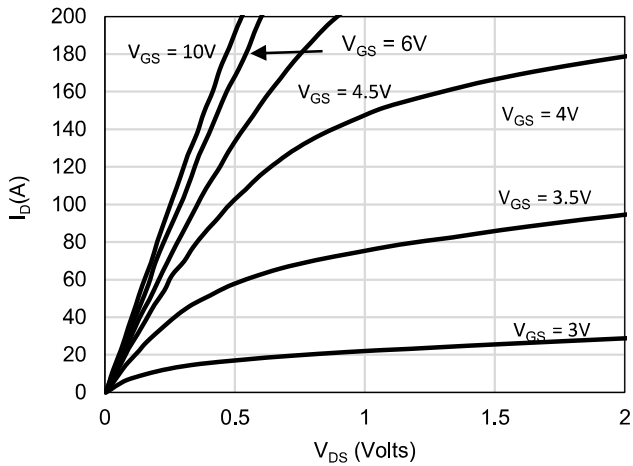


Figure 1: On-Region Characteristics

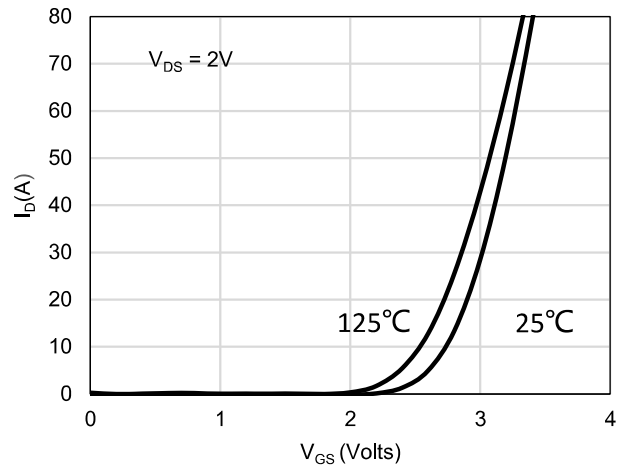


Figure 2: Transfer Characteristics

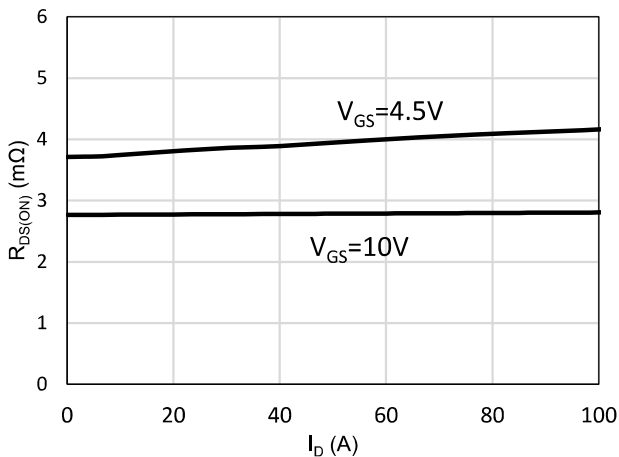


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

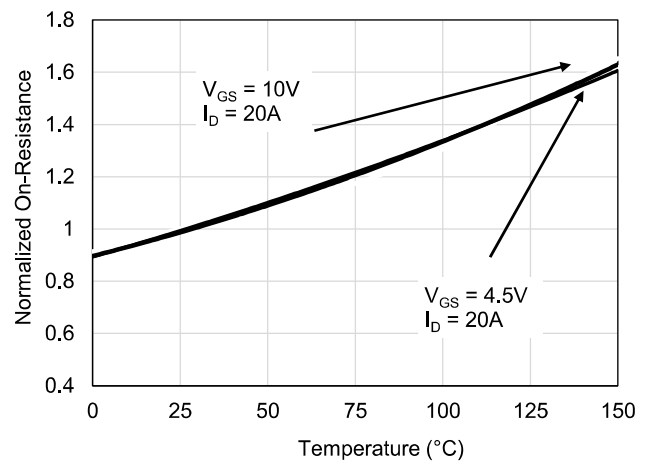


Figure 4: On-Resistance vs. Junction Temperature

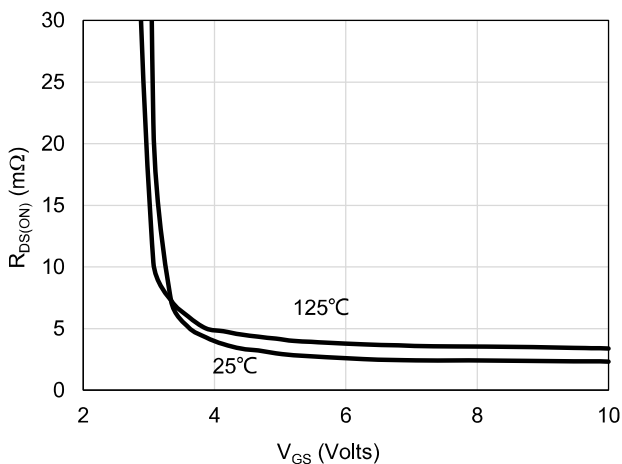


Figure 5: On-Resistance vs. Gate-Source Voltage

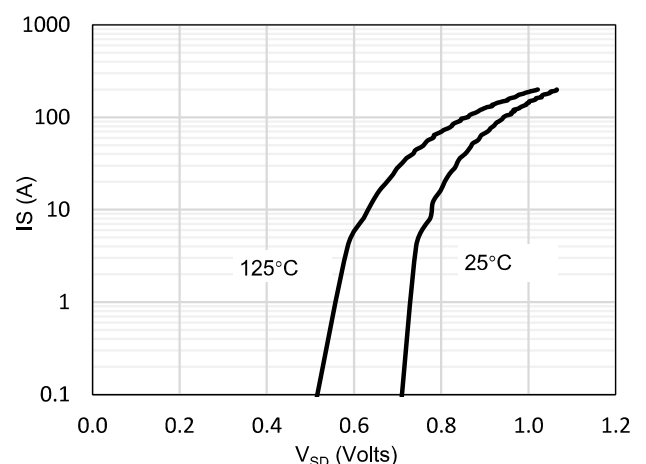


Figure 6: Body-Diode Characteristics

APG032N04G

N-Channel Enhancement Mosfet

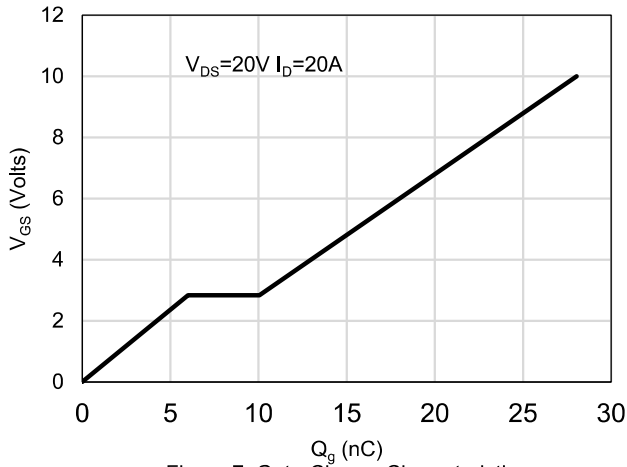


Figure 7: Gate-Charge Characteristics

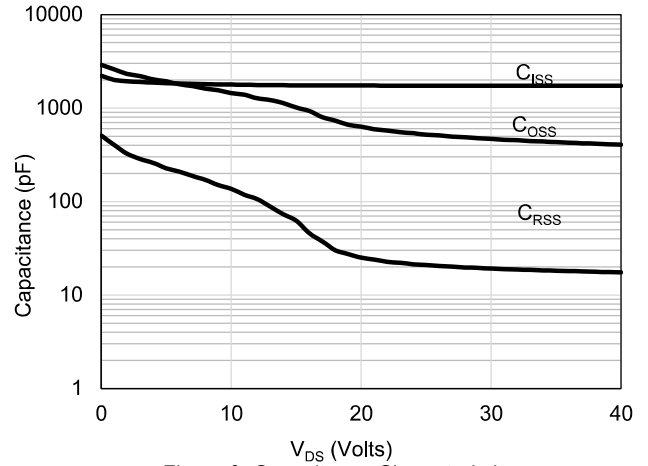


Figure 8: Capacitance Characteristics

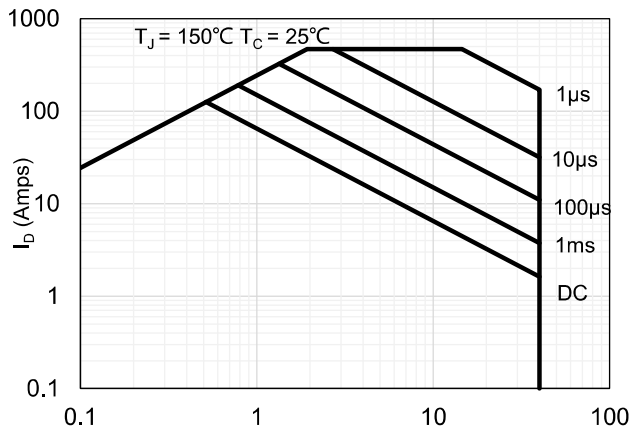


Figure 9: Maximum Forward Biased Safe Operating Area

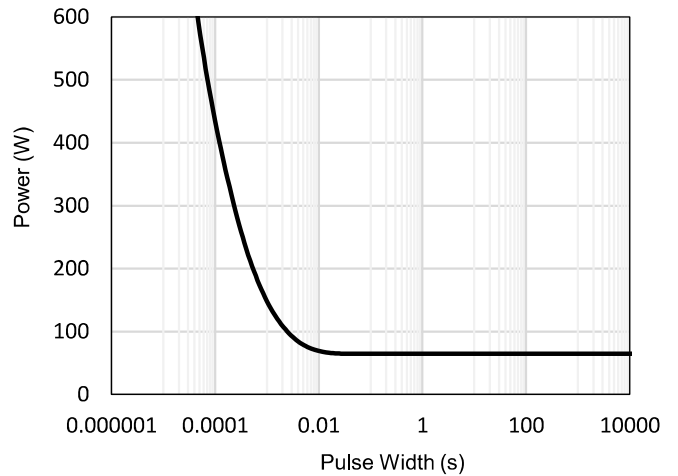


Figure 10: Single Pulse Power Rating Junction-to-Case

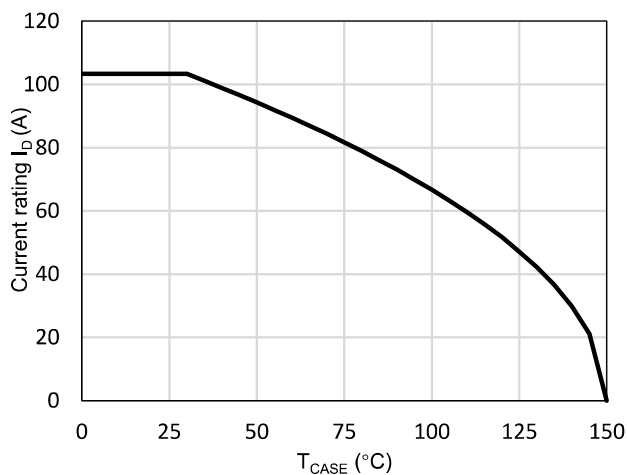


Figure 11: Current De-rating

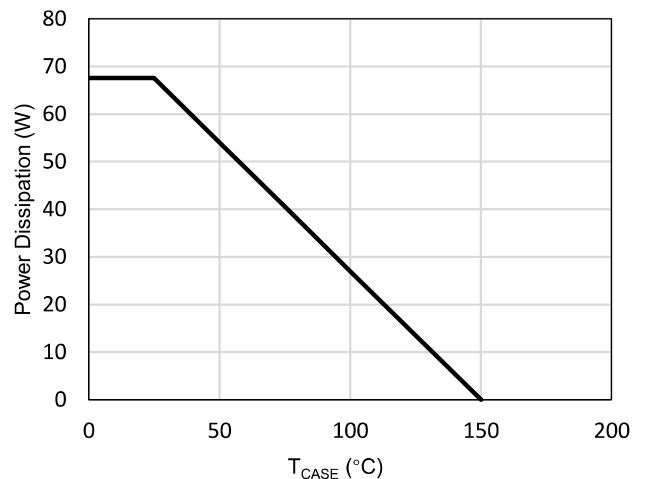
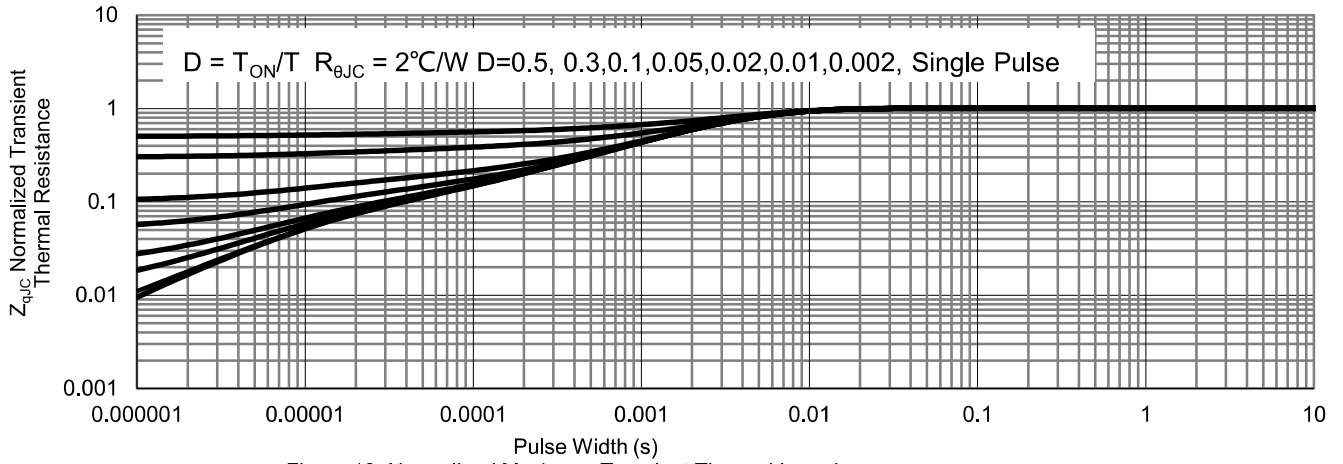
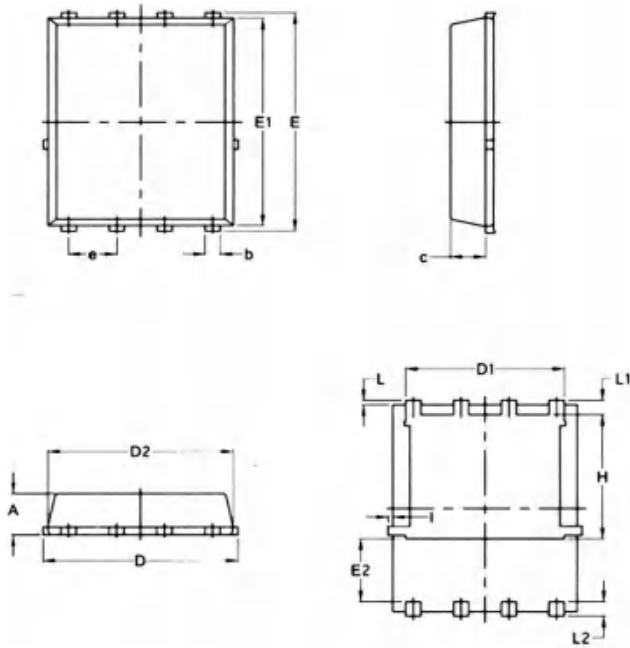


Figure 12: Power De-rating



PDFN5X6 Package Information



PDFN5X6

| SYMBOL | COMMON | | | |
|--------|----------|-------|----------|--------|
| | MM | | INCH | |
| | MIN. | MAX. | MIN. | MAX. |
| A | 1.03 | 1.17 | 0.0406 | 0.0461 |
| b | 0.34 | 0.48 | 0.0134 | 0.0189 |
| c | 0.824 | 0.970 | 0.0324 | 0.0382 |
| D | 4.80 | 5.40 | 0.1890 | 0.2126 |
| D1 | 4.11 | 4.31 | 0.1618 | 0.1697 |
| D2 | 4.80 | 5.00 | 0.1890 | 0.1969 |
| E | 5.95 | 6.15 | 0.2343 | 0.2421 |
| E1 | 5.65 | 5.85 | 0.2224 | 0.2303 |
| E2 | 1.60 | — | 0.0630 | — |
| e | 1.27 BSC | | 0.05 BSC | |
| L | 0.05 | 0.25 | 0.0020 | 0.0098 |
| L1 | 0.38 | 0.50 | 0.0150 | 0.0197 |
| L2 | 0.38 | 0.50 | 0.0150 | 0.0197 |
| H | 3.30 | 3.50 | 0.1299 | 0.1378 |
| I | — | 0.18 | — | 0.0070 |

PDFN5*6-8L Package Information