

RoHS Compliant Product
 A suffix of "-C" specifies halogen & lead-free

DESCRIPTION

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low R_{DS(on)} and to ensure minimal power loss and heat dissipation.

FEATURES

- Low R_{DS(on)} provides higher efficiency and extends battery life.
- Low thermal impedance copper leadframe SOP-8 saves board space
- Fast switching speed
- High performance trench technology

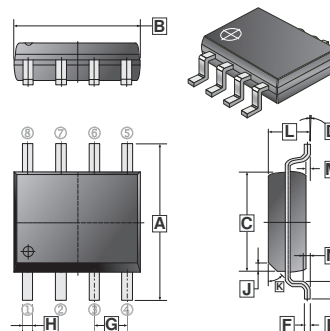
APPLICATION

DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones

PACKAGE INFORMATION

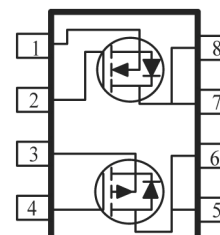
| Package | MPQ | Leader Size |
|---------|------|-------------|
| SOP-8 | 2.5K | 13 inch |

SOP-8



| REF. | Millimeter | | REF. | Millimeter | |
|------|------------|------|------|------------|------|
| | Min. | Max. | | Min. | Max. |
| A | 5.8 | 6.20 | H | 0.35 | 0.51 |
| B | 4.80 | 5.00 | J | 0.375 REF. | |
| C | 3.80 | 4.00 | K | 45° | |
| D | 0° | 8° | L | 1.35 | 1.75 |
| E | 0.50 | 0.93 | M | 0.10 | 0.25 |
| F | 0.19 | 0.25 | N | 0.25 REF. | |
| G | 1.27 TYP. | | | | |

Top View



ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise specified)

| Parameter | Symbol | Rating | | Unit | |
|---|-----------------------------------|-----------------------|------|------|--------|
| | | N-CH | P-CH | | |
| Drain-Source Voltage | V _{DS} | 30 | -30 | V | |
| Gate-Source Voltage | V _{GS} | ±20 | ±20 | V | |
| Continuous Drain Current ¹ | I _D | T _A = 25°C | 5.3 | -5.2 | A |
| | | T _A = 70°C | 4.2 | -4.1 | A |
| Pulsed Drain Current ² | I _{DM} | 20 | -20 | A | |
| Continuous Source Current (Diode Conduction) ¹ | I _S | 1.3 | -1.3 | A | |
| Total Power Dissipation ¹ | P _D | T _A = 25°C | 2.1 | | W |
| | | T _A = 70°C | 1.3 | | W |
| Operating Junction & Storage Temperature Range | T _J , T _{STG} | -55 ~ 150 | | °C | |
| Thermal Resistance Ratings | | | | | |
| Maximum Junction-to-Ambient ¹ | R _{θJA} | t ≤ 10 sec | 62.5 | | °C / W |
| | | Steady State | 110 | | °C / W |

Notes:

1. Surface Mounted on 1" x 1" FR4 Board.
2. Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise specified)

| Parameter | Symbol | Ch | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---------------------|----|------|-------|------|------|--|
| Static | | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | N | 1.2 | 1.7 | 2.5 | V | V _{DS} =V _{GS} , I _D =250μA |
| | | P | -1.2 | -1.8 | -2.5 | | V _{DS} =V _{GS} , I _D = -250μA |
| Gate-Body Leakage | I _{GSS} | N | - | ±80 | ±100 | nA | V _{DS} =0, V _{GS} =20V |
| | | P | - | ±80 | ±100 | | V _{DS} =0, V _{GS} = -20V |
| Zero Gate Voltage Drain Current | I _{DSS} | N | - | 0.8 | 1 | μA | V _{DS} =24V, V _{GS} =0 |
| | | P | - | -0.8 | -1 | | V _{DS} = -24V, V _{GS} =0 |
| On-State Drain Current ¹ | I _{D(on)} | N | 20 | 24 | - | A | V _{DS} =5V, V _{GS} =10V |
| | | P | -20 | -24 | - | | V _{DS} = -5V, V _{GS} = -10V |
| Drain-Source On-Resistance ¹ | R _{DS(ON)} | N | - | 43 | 50 | mΩ | V _{GS} =10V, I _D =5.3A |
| | | | - | 70 | 82 | | V _{GS} =4.5V, I _D =4.2A |
| | | P | - | 45 | 52 | | V _{GS} = -10V, I _D = -5.2A |
| | | | - | 72 | 80 | | V _{GS} = -4.5V, I _D = -4.2A |
| Diode Forward Voltage | V _{SD} | N | - | 0.75 | - | V | V _{GS} =0, I _S =1.3A |
| | | P | - | -0.88 | - | | V _{GS} =0, I _S = -1.3A |
| Dynamic ² | | | | | | | |
| Total Gate Charge | Q _g | N | - | 2.2 | - | nC | N-Channel I _D =5.3A, V _{DS} =15V, V _{GS} =10V P-Channel I _D = -5.2A, V _{DS} = -10V, V _{GS} = -15V |
| | | P | - | 10 | - | | |
| Gate-Source Charge | Q _{gs} | N | - | 0.5 | - | | |
| | | P | - | 2.2 | - | | |
| Gate-Drain Charge | Q _{gd} | N | - | 0.8 | - | | |
| | | P | - | 1.7 | - | | |
| Turn-On Delay Time | T _{d(on)} | N | - | 8 | - | nS | N-Channel V _{DD} =15V, V _{GEN} =10V I _D =1A, R _{GEN} =6Ω P-Channel V _{DD} = -15V, V _{GEN} = -10V I _D = -1A, R _{GEN} =6Ω |
| | | P | - | 10 | - | | |
| Rise Time | T _r | N | - | 5 | - | | |
| | | P | - | 2.8 | - | | |
| Turn-Off Delay Time | T _{d(off)} | N | - | 23 | - | | |
| | | P | - | 53.6 | - | | |
| Fall Time | T _f | N | - | 3 | - | | |
| | | P | - | 46 | - | | |

Notes:

1. Pulse test : PW ≤ 300μs duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.

CHARACTERISTIC CURVES (N-Channel)

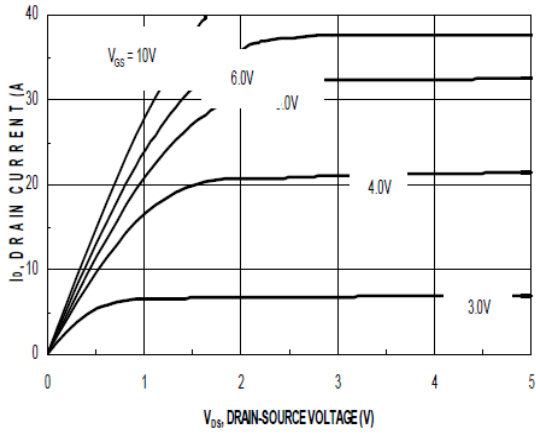


Figure 1. On-Region Characteristics

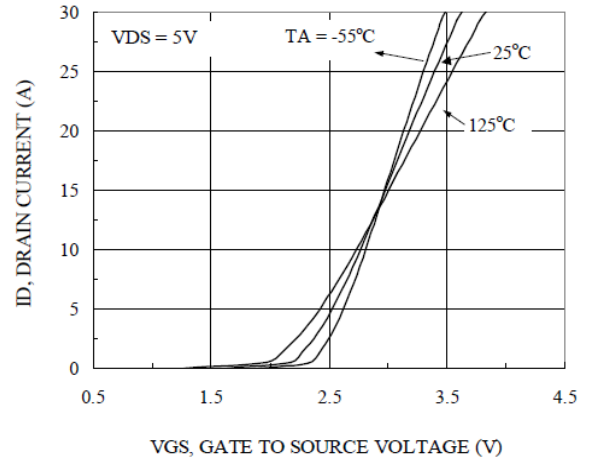


Figure 2. Body Diode Forward Voltage Variation with Source Current and Temperature

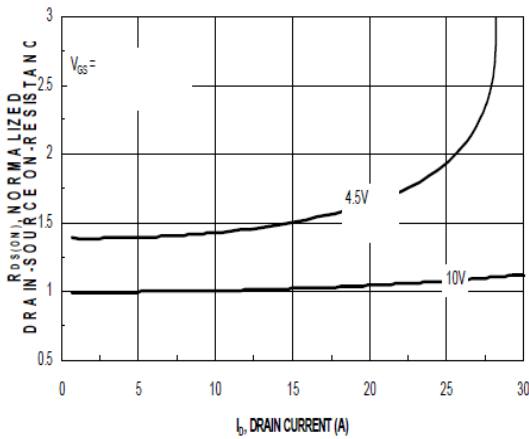


Figure 3. On Resistance Vs Vgs Voltage

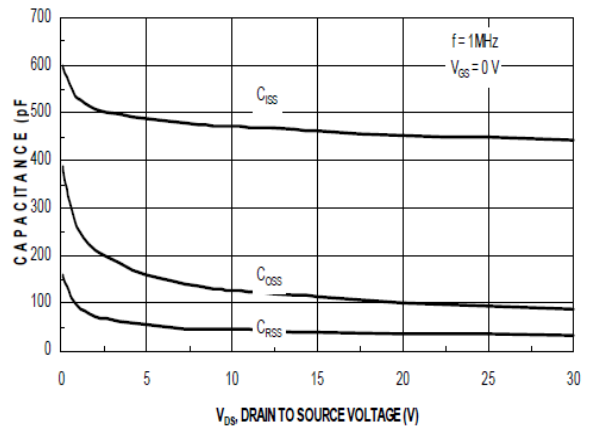


Figure 4. Capacitance Characteristics

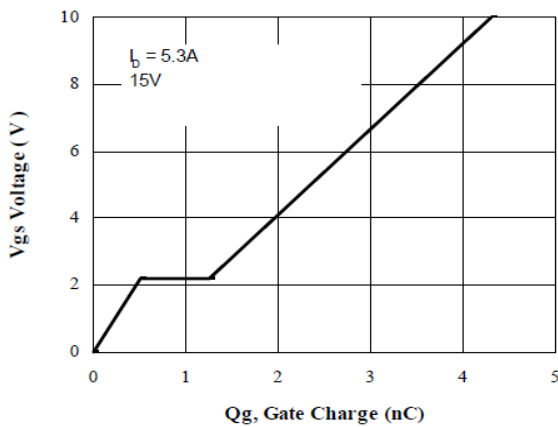


Figure 5. Gate Charge Characteristics

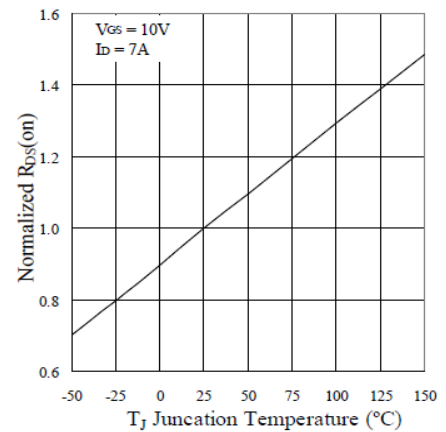


Figure 6. On-Resistance Variation with Temperature

CHARACTERISTIC CURVES

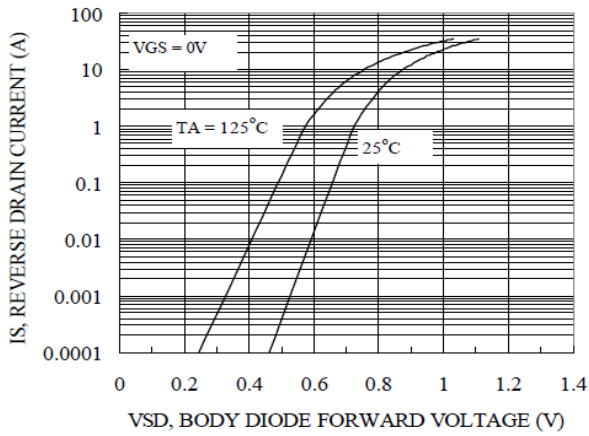


Figure 7. Transfer Characteristics

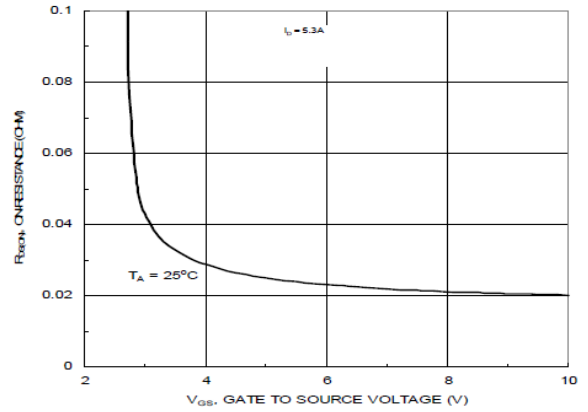


Figure 8. On-Resistance with Gate to Source Voltage

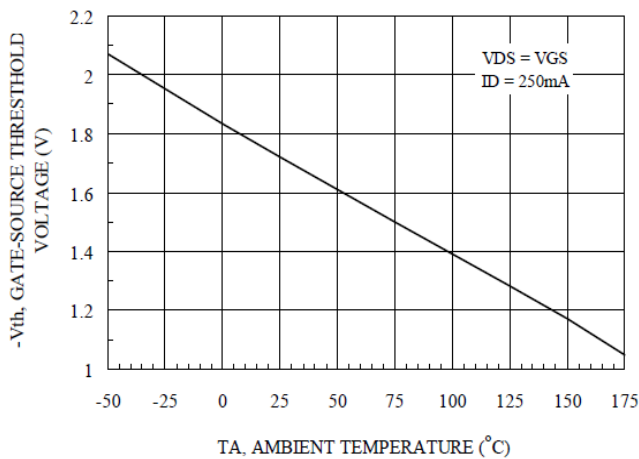


Figure 9. V_{th} Gate to Source Voltage Vs Temperature

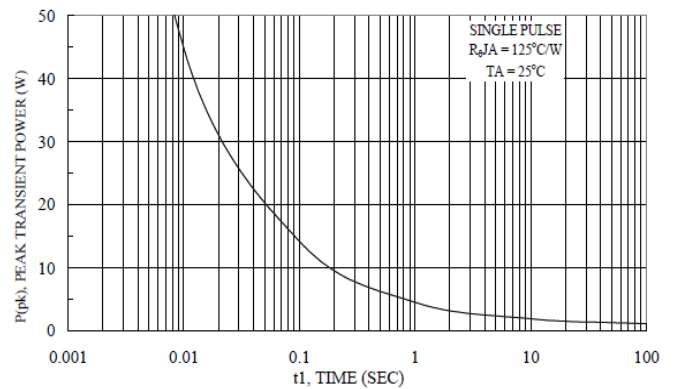


Figure 10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient

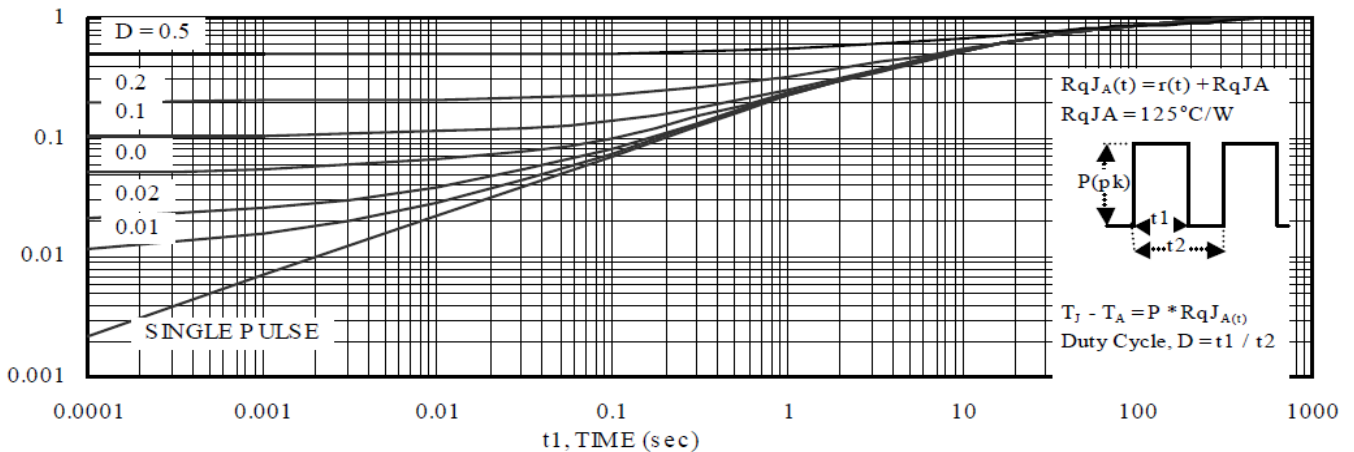


Figure 11. Transient Thermal Response Curve

CHARACTERISTIC CURVES (P-Channel)

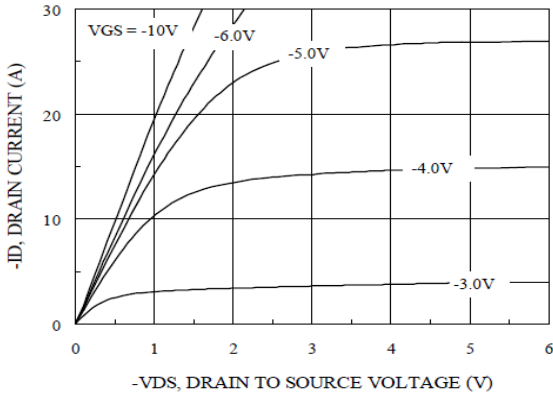


Figure 1. On-Region Characteristics

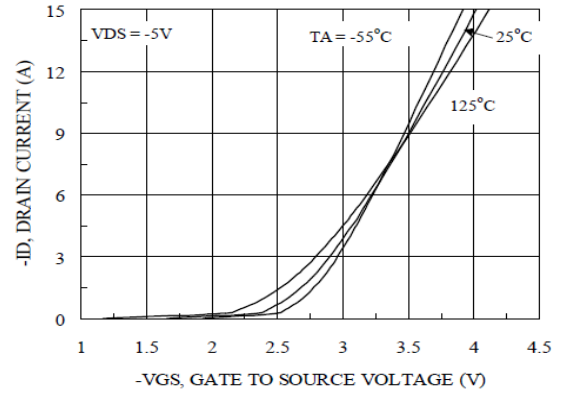


Figure 2. Body Diode Forward Voltage Variation with Source Current and Temperature

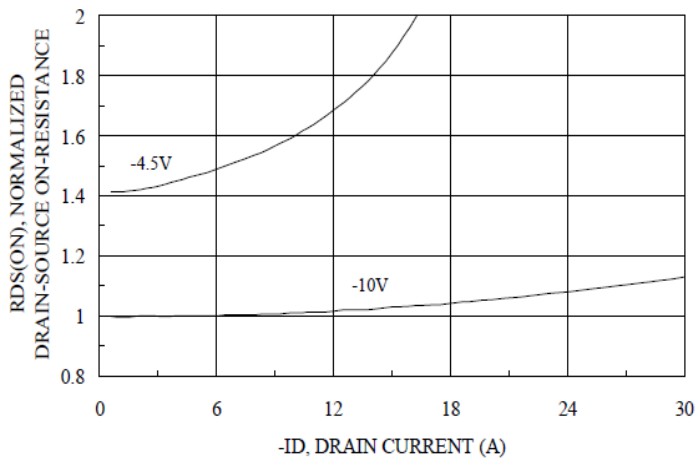


Figure 3. On Resistance Vs Vgs Voltage

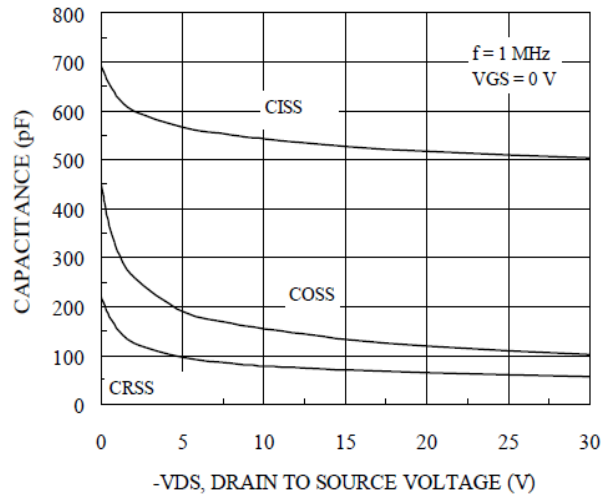


Figure 4. Capacitance Characteristics

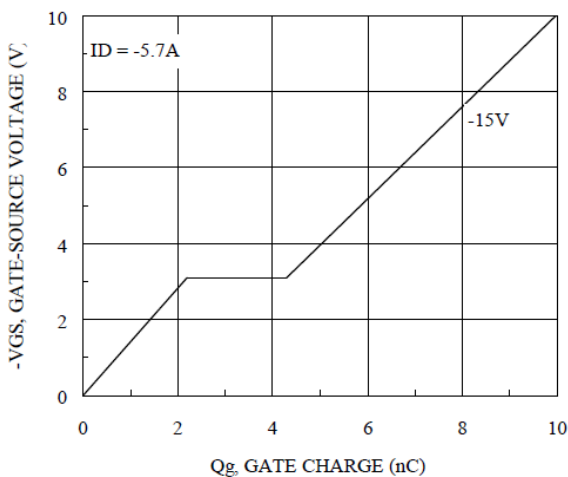


Figure 5. Gate Charge Characteristics

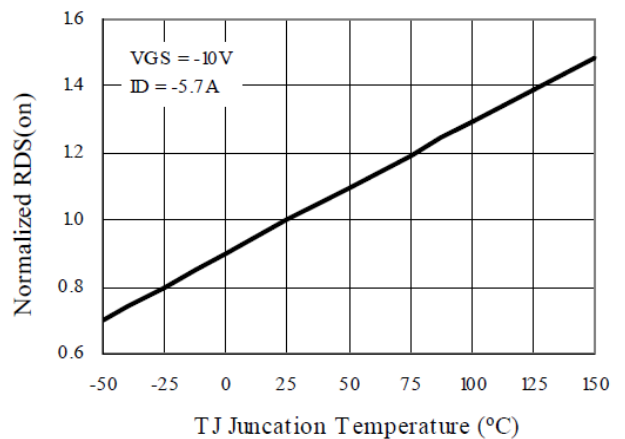


Figure 6. On-Resistance Variation with Temperature

CHARACTERISTIC CURVES

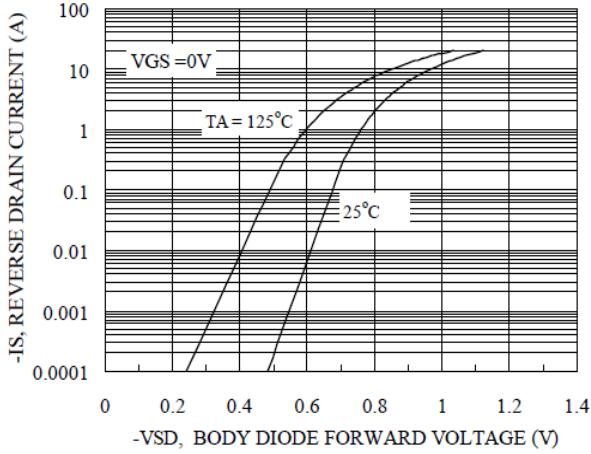


Figure 7. Transfer Characteristics

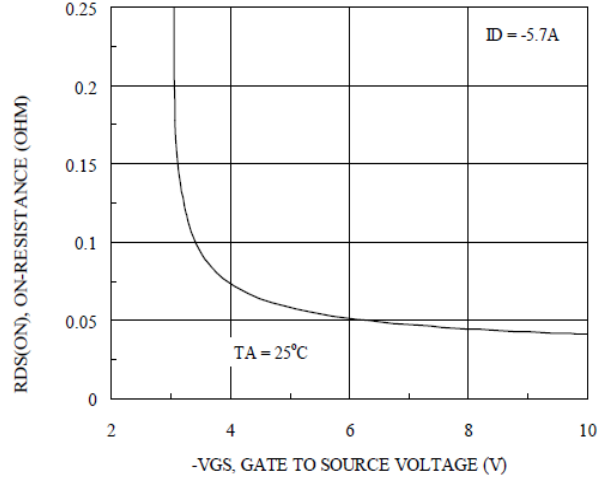


Figure 8. On-Resistance with Gate to Source Voltage

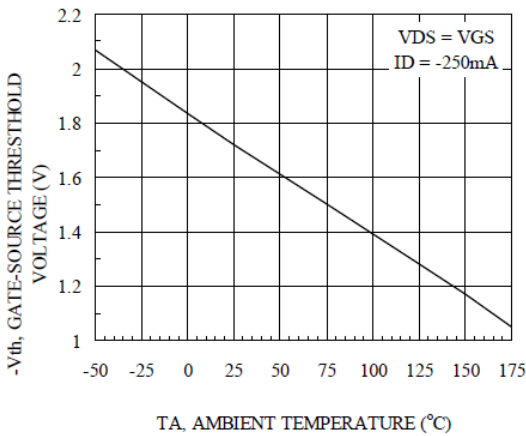


Figure 9. V_{th} Gate to Source Voltage Vs Temperature

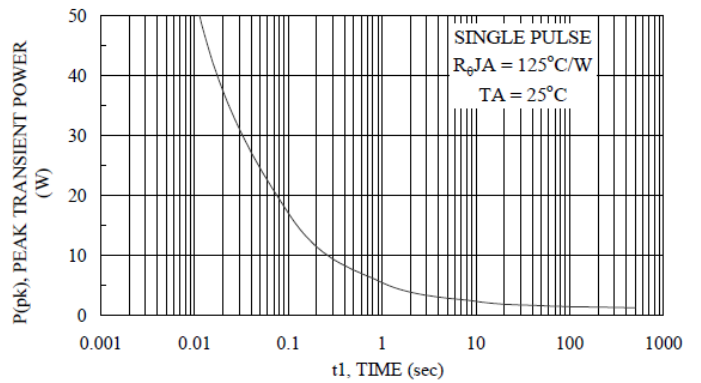


Figure 10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient

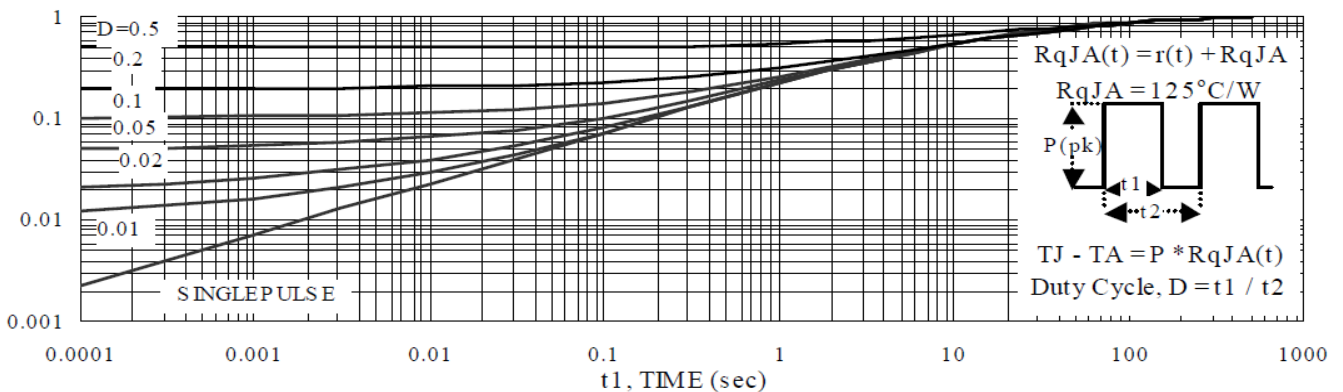


Figure 11. Transient Thermal Response Curve