



SPN9507

N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN9507 is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density , DMOS trench technology.

This high density process is especially tailored to minimize on-state resistance.

These devices are particularly suited for low voltage application , notebook computer power management and other battery powered circuits where high-side switching .

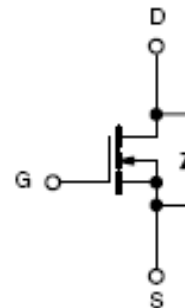
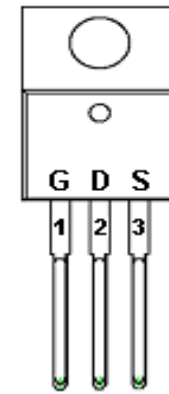
FEATURES

- ◆ 75V/60A, $R_{DS(ON)}= 5.0m\Omega@V_{GS}= 10V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TO-220-3L package design

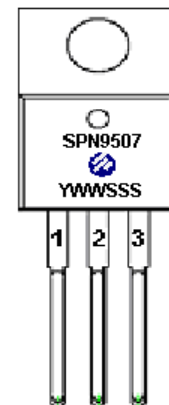
APPLICATIONS

- DC/DC Converter
- Load Switch
- SMPS Secondary Side Synchronous Rectifier

PIN CONFIGURATION(TO-220-3L)



PART MARKING



Y : Last Digit of The Year
W : Week
S : Sequence



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PIN DESCRIPTION

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1 | G | Gate |
| 2 | D | Drain |
| 3 | S | Source |

ORDERING INFORMATION

| Part Number | Package | Part Marking |
|----------------|-----------|--------------|
| SPN9507T220TGB | TO-220-3L | SPN9507 |

※ SPN9507T220TGB: Tube ; Pb – Free; Halogen – Free

ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

| Parameter | Symbol | Typical | Unit | |
|--|------------------|---------|------|---|
| Drain-Source Voltage | V _{DSS} | 75 | V | |
| Gate –Source Voltage | V _{GSS} | ±20 | V | |
| Continuous Drain Current(T _J =150°C) | I _D | TA=25°C | 80 | A |
| | | TA=70°C | 70 | |
| Pulsed Drain Current | I _{DM} | 240 | A | |
| Power Dissipation | P _D | TA=25°C | 300 | W |
| | | TA=70°C | 3.38 | |
| Avalanche Energy with Single Pulse (T _j =25°C , L = 0.12mH , I _{AS} = 80A , V _{DD} = 60V.) | EAS | 380 | mJ | |
| Operating Junction Temperature | T _J | -55/150 | °C | |
| Storage Temperature Range | T _{STG} | -55/150 | °C | |
| Thermal Resistance-Junction to Ambient | R _{θJA} | 2 | °C/W | |



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ELECTRICAL CHARACTERISTICS

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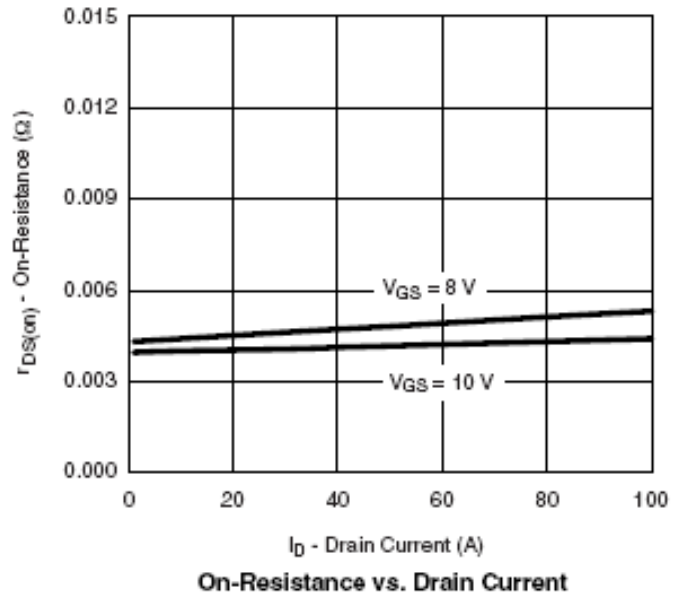
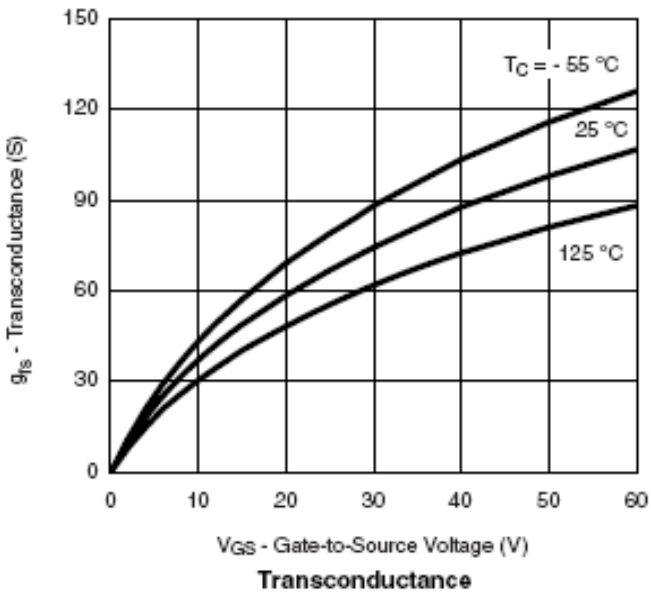
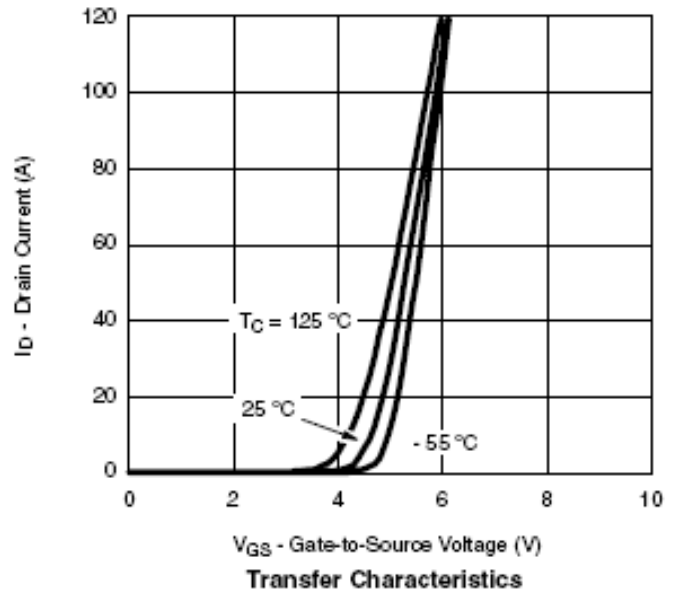
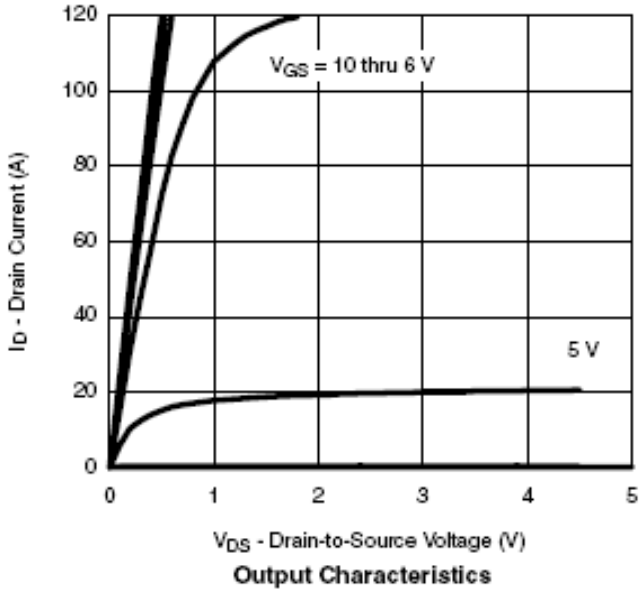
| Parameter | Symbol | Conditions | Min. | Typ | Max. | Unit |
|---------------------------------|---------------|--|------|------|-----------|------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 75 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 2.0 | | 4.0 | |
| Gate Leakage Current | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 20V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=75V, V_{GS}=0V$ | | | 10 | uA |
| | | $V_{DS}=60V, V_{GS}=0V$ $T_J = 150^\circ C$ | | | 250 | |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=60A$ | | | 5.0 | mΩ |
| Forward Transconductance | g_{fs} | $V_{DS}=10V, I_D=60A$ | | 57 | | S |
| Diode Forward Voltage | V_{SD} | $I_S=60A, V_{GS}=0V$ | | | 1.3 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q_g | $V_{DS}=40V, V_{GS}=10V$ $I_D=80A$ | | 85 | 135 | nC |
| Gate-Source Charge | Q_{gs} | | | 25 | | |
| Gate-Drain Charge | Q_{gd} | | | 36 | | |
| Input Capacitance | C_{iss} | $V_{DS}=25V, V_{GS}=0V$ $f=1MHz$ | | 4290 | 6870 | pF |
| Output Capacitance | C_{oss} | | | 985 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 390 | | |
| Turn-On Time | $t_{d(on)}$ | $V_{DD}=40V, R_L=0.5\Omega$ $I_D=80A, V_{GEN}=10V$ $R_G=3.3\Omega$ | | 22 | | nS |
| | t_r | | | 160 | | |
| Turn-Off Time | $t_{d(off)}$ | | | 38 | | |
| | t_f | | | 165 | | |



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TYPICAL CHARACTERISTICS

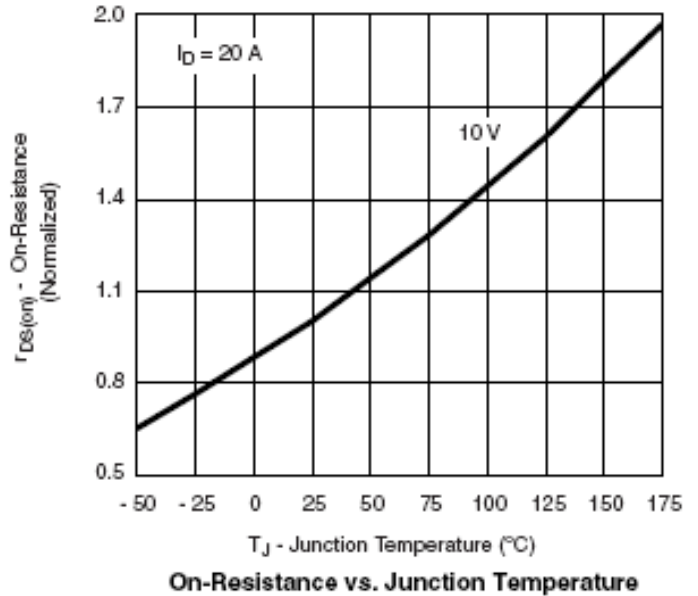
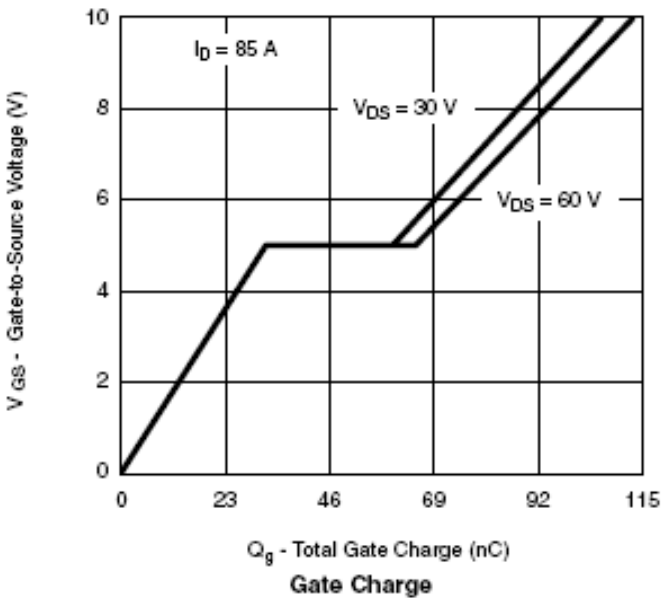
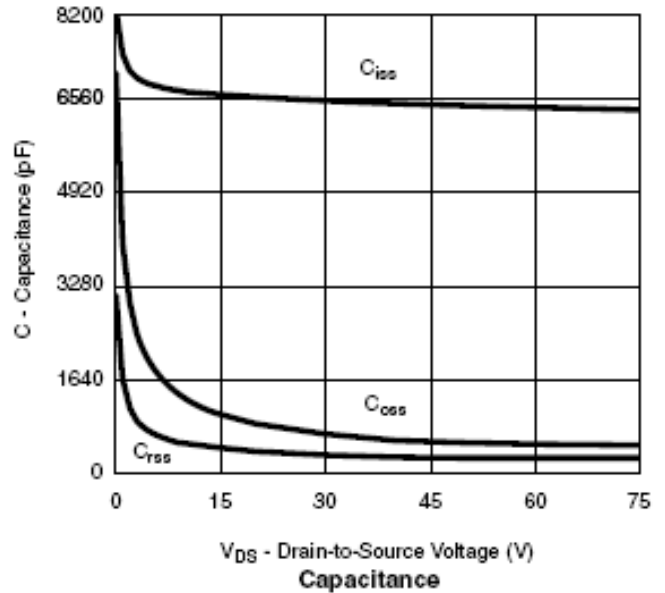
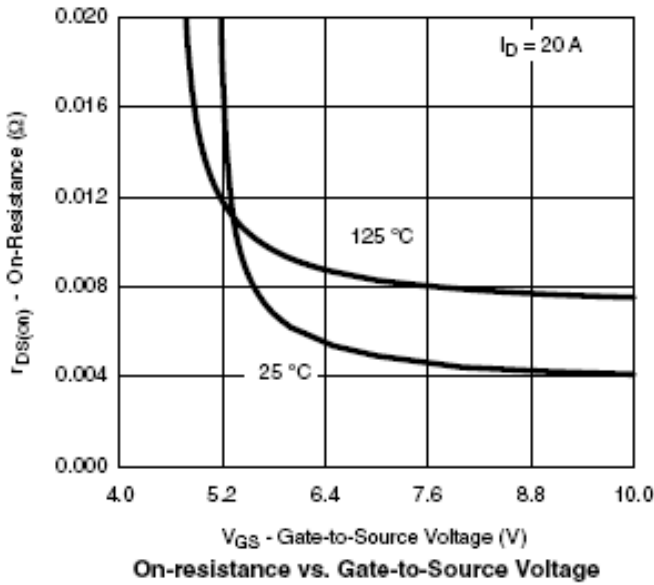




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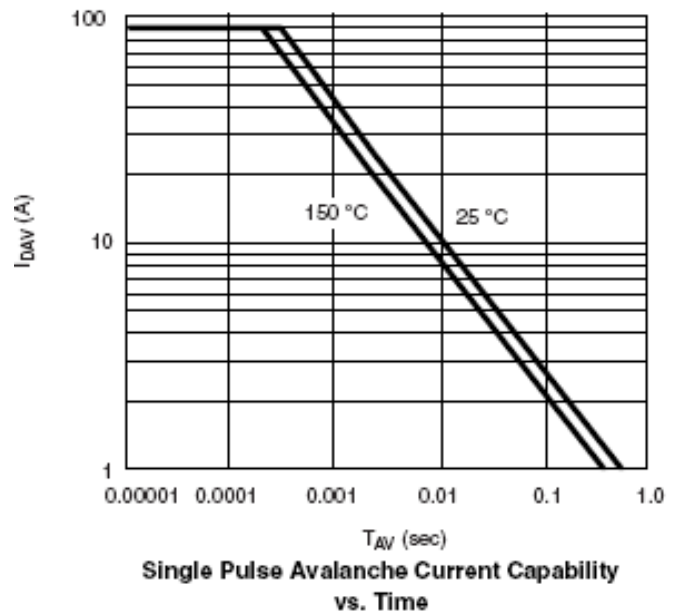
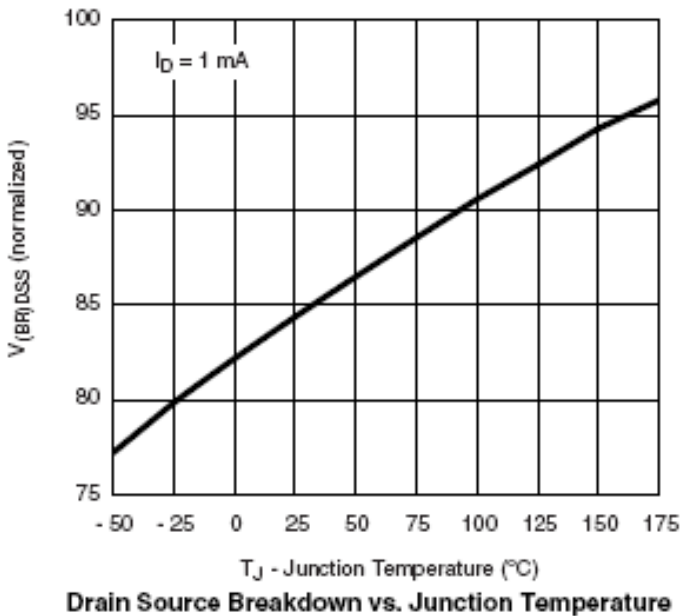
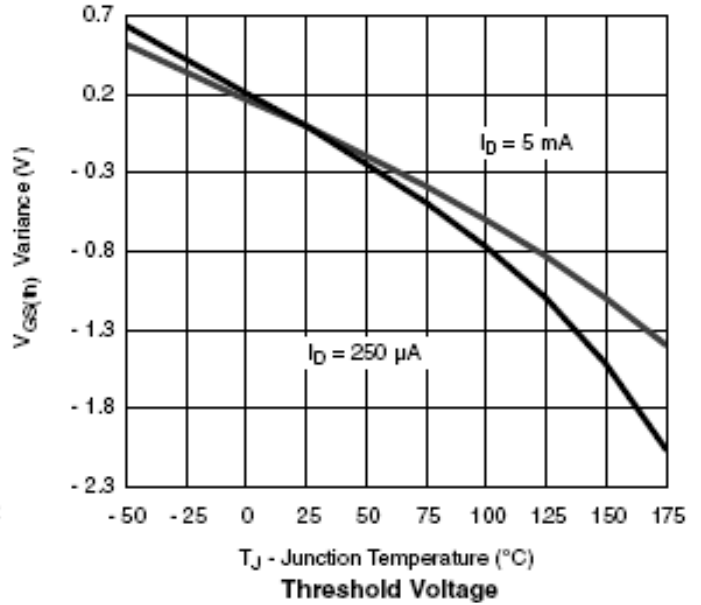
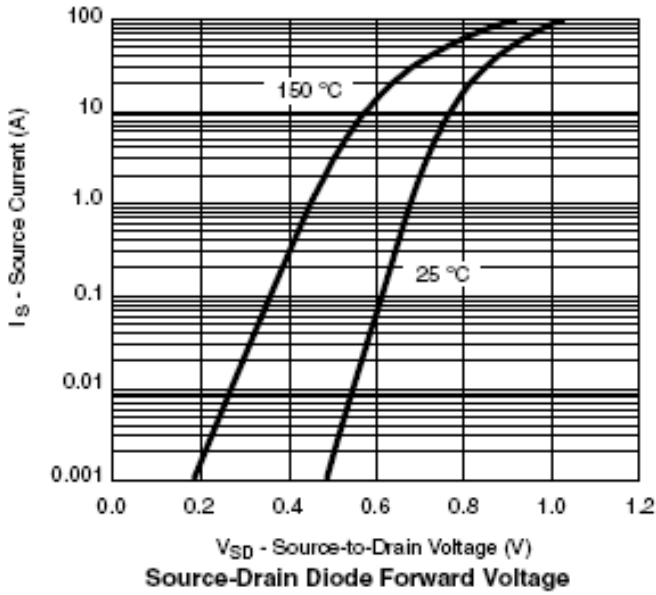
TYPICAL CHARACTERISTICS





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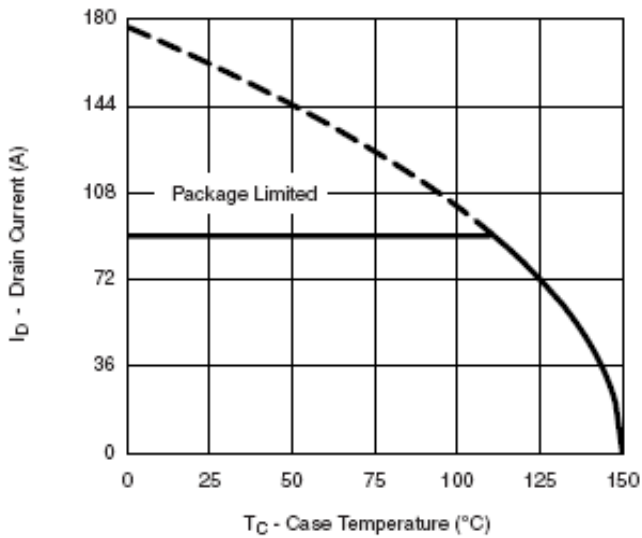
TYPICAL CHARACTERISTICS



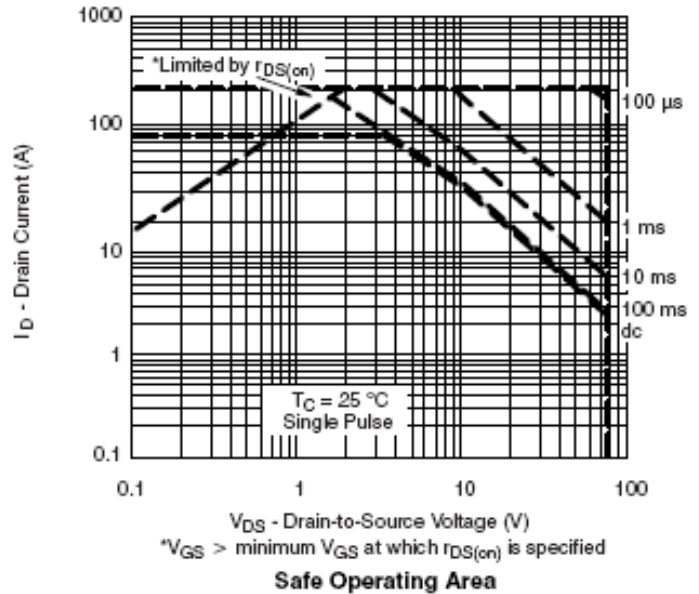


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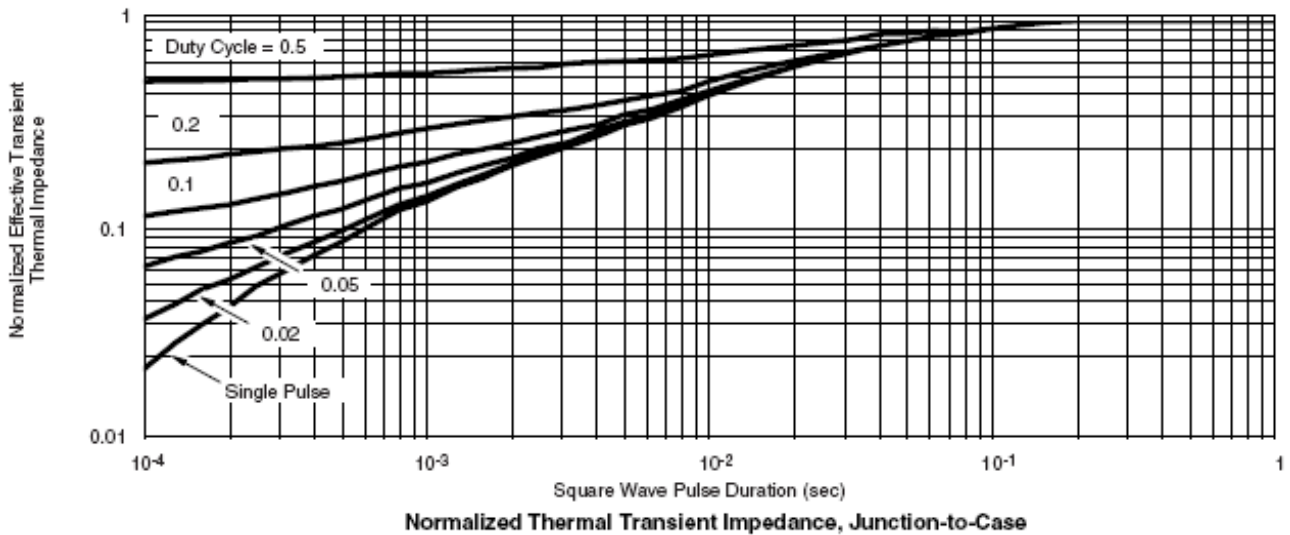
TYPICAL CHARACTERISTICS



Maximum Drain Current vs. Case Temperature



Safe Operating Area



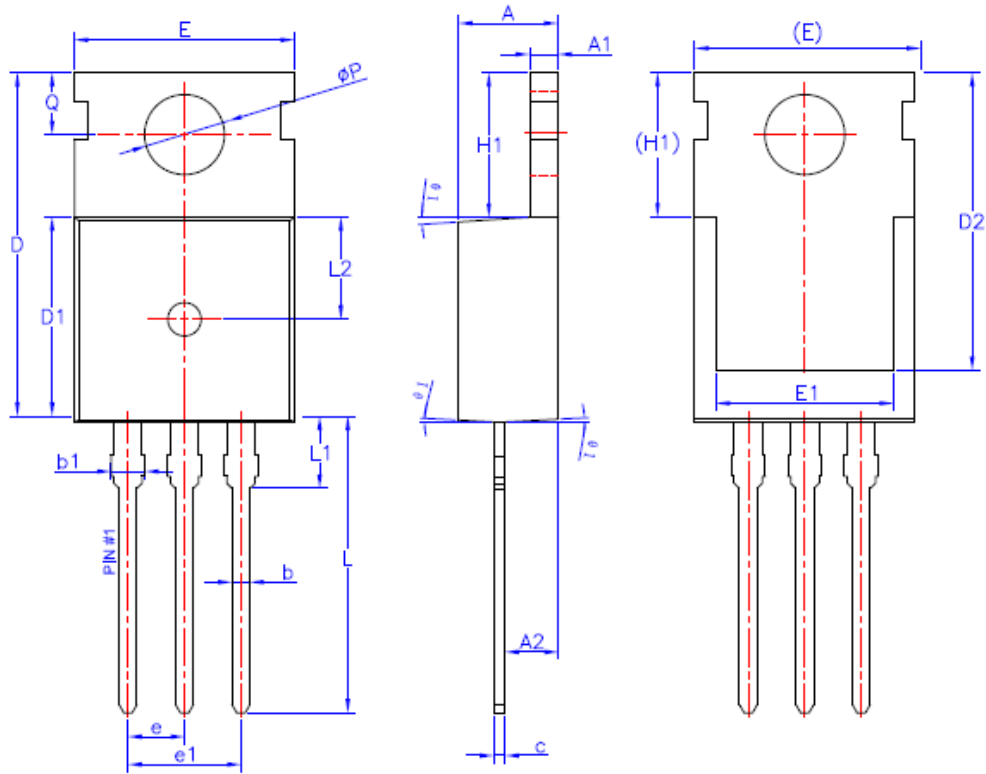
Normalized Thermal Transient Impedance, Junction-to-Case



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TO-220-3L PACKAGE OUTLINE



| SYMBOL | MIN | NOM | MAX |
|--------|---------|-------|-------|
| A | 4.40 | 4.50 | 4.60 |
| A1 | 1.27 | 1.30 | 1.33 |
| A2 | 2.30 | 2.40 | 2.50 |
| b | 0.70 | — | 0.90 |
| b1 | 1.42 | — | 1.57 |
| c | 0.45 | 0.50 | 0.60 |
| D | 15.30 | 15.70 | 16.10 |
| D1 | 9.10 | 9.20 | 9.30 |
| D2 | 13.10 | — | 13.70 |
| E | 9.70 | 9.90 | 10.20 |
| E1 | 7.80 | 8.00 | 8.20 |
| e | 2.54BSC | | |
| e1 | 5.08BSC | | |
| H1 | 6.30 | 6.50 | 6.70 |
| L | 12.78 | 13.08 | 13.38 |
| L1 | — | — | 3.50 |
| L2 | 4.60REF | | |
| φP | 3.55 | 3.60 | 3.65 |
| Q | 2.73 | — | 2.87 |
| θ1 | 1° | 3° | 5° |



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