

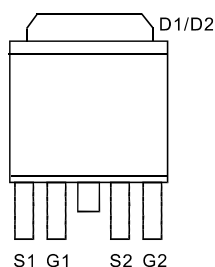
N- and P-Channel 40-V (D-S) MOSFET

GENERAL DESCRIPTION

The ME4565AD4 is the N and P-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 such as cellular phone and notebook computer power management and other battery powered circuits where high-side switching, and low in-line power loss are needed in a very small outline surface mount package.

PIN CONFIGURATION

(TO-252-4L)
Top View

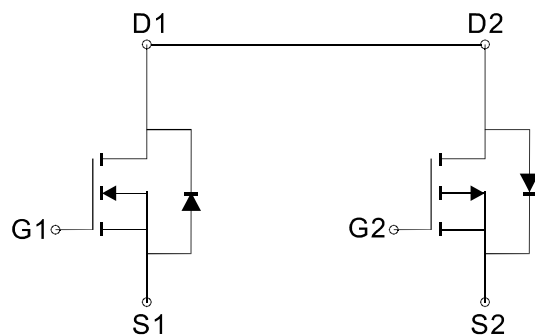


FEATURES

- R_{DS(ON)} 30mΩ@V_{GS}=10V (N-Ch)
- R_{DS(ON)} 58mΩ@V_{GS}=4.5V (N-Ch)
- R_{DS(ON)} 45mΩ@V_{GS}=-10V (P-Ch)
- R_{DS(ON)} 75mΩ@V_{GS}=-4.5V(P-Ch)
- Super high density cell design for extremely low R_{DS(ON)}
- Exceptional on-resistance and maximum DC current capability

APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- LCD Display inverter



N-Channel MOSFET

P-Channel MOSFET

Ordering Information: ME4565AD4 (Pb-free)

ME4565AD4-G (Green product-Halogen free)

Absolute Maximum Ratings (T_A=25 Unless Otherwise Noted)

| Parameter | | Symbol | N-Channel | P-Channel | Unit | |
|---|--------------------|------------------|------------|-----------|--------|----|
| Drain-Source Voltage | | V _{DSS} | 40 | -40 | V | |
| Gate-Source Voltage | | V _{GSS} | ±25 | ±25 | V | |
| Continuous Drain Current(T _J =150)* | T _C =25 | I _D | 22.1 | -18.6 | A | |
| | T _C =70 | | 17.7 | -14.9 | | |
| | T _A =25 | | 7.4 | -6.1 | | |
| | T _A =70 | | 5.9 | -5 | | |
| Pulsed Drain Current | | I _{DM} | 30 | -30 | A | |
| Maximum Power Dissipation | T _A =25 | P _D | 2.6 | 2.7 | W | |
| | T _A =70 | | 1.67 | 1.7 | | |
| Operating Junction Temperature | | T _J | -55 to 150 | | | |
| Thermal Resistance-Junction to Ambient* | | R _{θJA} | Steady | 48 | Steady | 46 |
| | | | 10sec | 20 | 10sec | 18 |
| Thermal Resistance-Junction to Case* | | R _{θJC} | 5.3 | | 5 | |

*The device mounted on 1in² FR4 board with 2 oz copper

N- and P-Channel 40-V (D-S) MOSFET

Electrical Characteristics (TA=25 Unless Otherwise Specified)

| Symbol | Parameter | Limit | Min | Typ | Max | Unit |
|----------------------|---|---|--------------|-------------|--------------|------|
| STATIC | | | | | | |
| V _{(BR)DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =250 μA V _{GS} =0V, I _D =250 μA | N-Ch P-Ch | 40 -40 | | V |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =250 μA V _{DS} =V _{GS} , I _D =-250 μA | N-Ch P-Ch | 1 -1 | 3 -3 | V |
| I _{GSS} | Gate Leakage Current | V _{DS} =0V, V _{GS} =±25V V _{DS} =0V, V _{GS} =±25V | N-Ch P-Ch | | ±100 ±100 | nA |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =40V, V _{GS} =0V V _{DS} =-40V, V _{GS} =0V | N-Ch P-Ch | | 1 -1 | μA |
| | | V _{DS} =40V, V _{GS} =0V, T _J =55 V _{DS} =-40V, V _{GS} =0V, T _J =55 | N-Ch P-Ch | | 10 -10 | |
| R _{DS(ON)} | Drain-Source On-State Resistance ^a | V _{GS} =10V, I _D = 7A V _{GS} =-10V, I _D = -7A | N-Ch P-Ch | 23 36 | 30 45 | m |
| | | V _{GS} =4.5V, I _D = 6A V _{GS} =-4.5V, I _D = -6A | N-Ch P-Ch | 42 58 | 58 75 | |
| V _{SD} | Diode Forward Voltage | I _S =1.7A, V _{GS} =0V I _S =-1.7A, V _{GS} =0V | N-Ch P-Ch | 0.7 -0.7 | 1.2 -1.2 | V |
| DYNAMIC | | | | | | |
| Q _g | Total Gate Charge | N-Channel V _{DS} =20V, V _{GS} =4.5V, I _D =7A P-Channel V _{DS} =-20V, V _{GS} =-4.5V, I _D =-7A | N-Ch P-Ch | 8 10 | | nC |
| Q _{gs} | Gate-Source Charge | | N-Ch P-Ch | 4 4.3 | | |
| Q _{gd} | Gate-Drain Charge | | N-Ch P-Ch | 4 4.5 | | |
| R _g | Gate Resistance | V _{GS} =0V, V _{DS} =0V, f=1MHz V _{GS} =0V, V _{DS} =0V, f=1MHz | N-Ch P-Ch | 0.7 6 | | |
| C _{iss} | Input capacitance | N-Channel V _{DS} =20V, V _{GS} =0V, F=1MHz P-Channel V _{DS} =-20V, V _{GS} =0V, F=1MHz | N-Ch P-Ch | 560 860 | | pF |
| C _{oss} | Output Capacitance | | N-Ch P-Ch | 72 120 | | |
| C _{rss} | Reverse Transfer Capacitance | | N-Ch P-Ch | 18 35 | | |
| t _{d(on)} | Turn-On Delay Time | N-Channel V _{DD} =15V, R _L =15 I _D =1A, V _{GEN} =10V, R _G =6 P-Channel V _{DD} =-15V, R _L =15 I _D =-1A, V _{GEN} =-10V, R _G =6 | N-Ch P-Ch | 11 30 | | ns |
| t _r | Turn-On Rise Time | | N-Ch P-Ch | 13 8.5 | | |
| t _{d(off)} | Turn-Off Delay Time | | N-Ch P-Ch | 37 70 | | |
| t _f | Turn-On Fall Time | | N-Ch P-Ch | 3.5 7 | | |

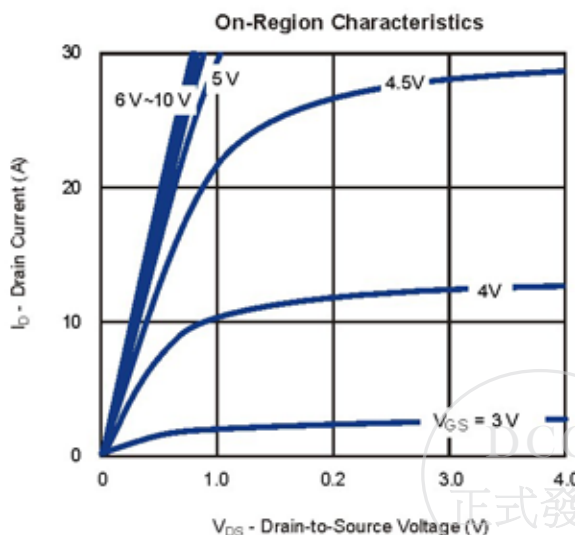
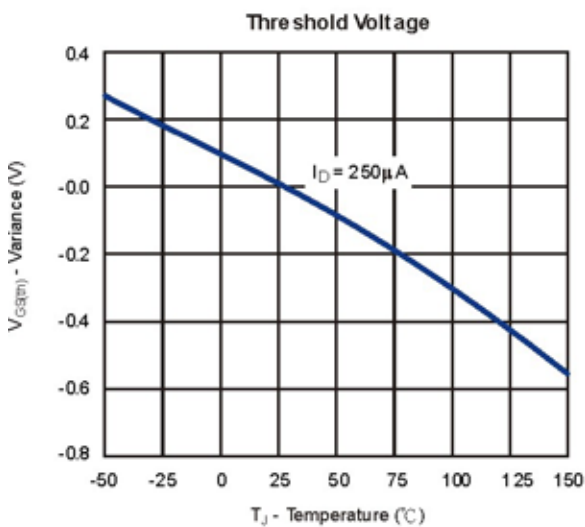
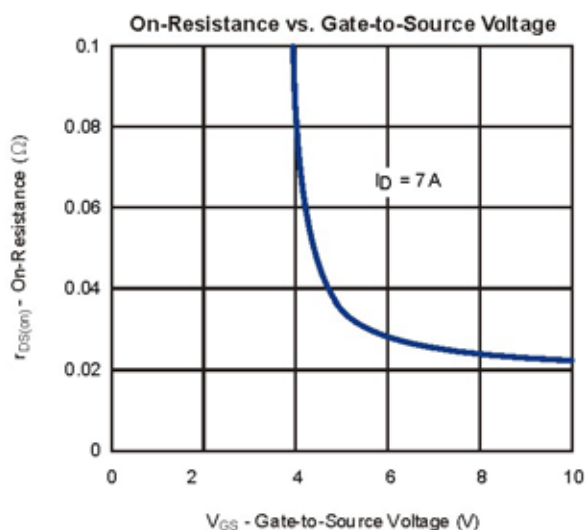
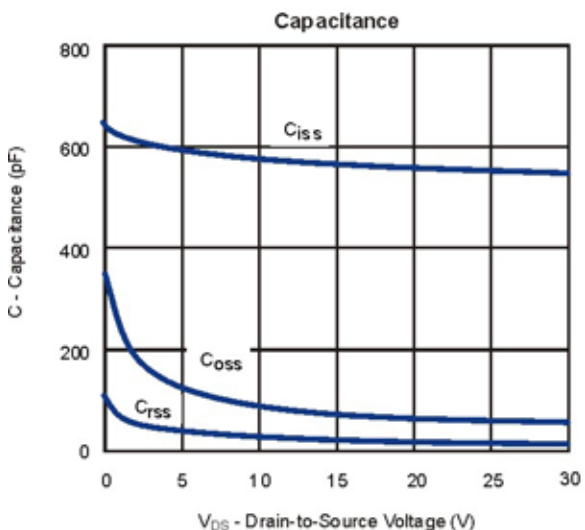
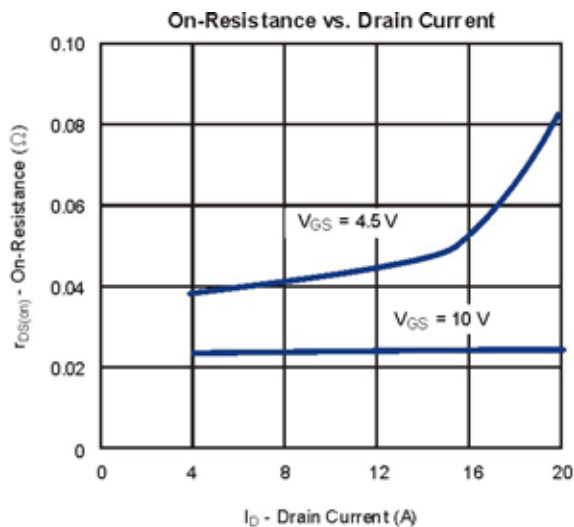
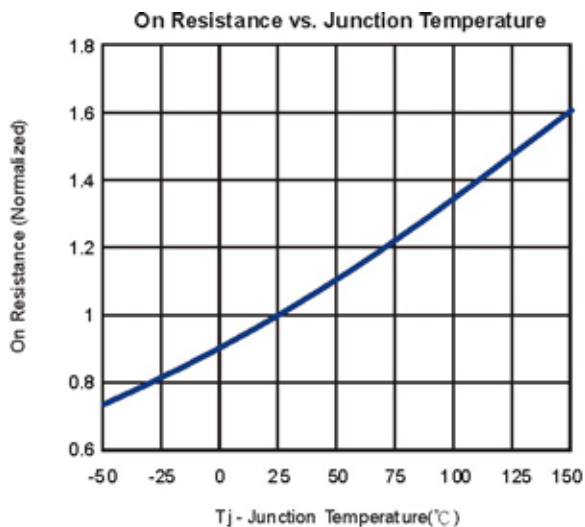
Notes: a. Pulse test; pulse width 300us, duty cycle 2%



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Typical Characteristics (T_J =25 Noted)

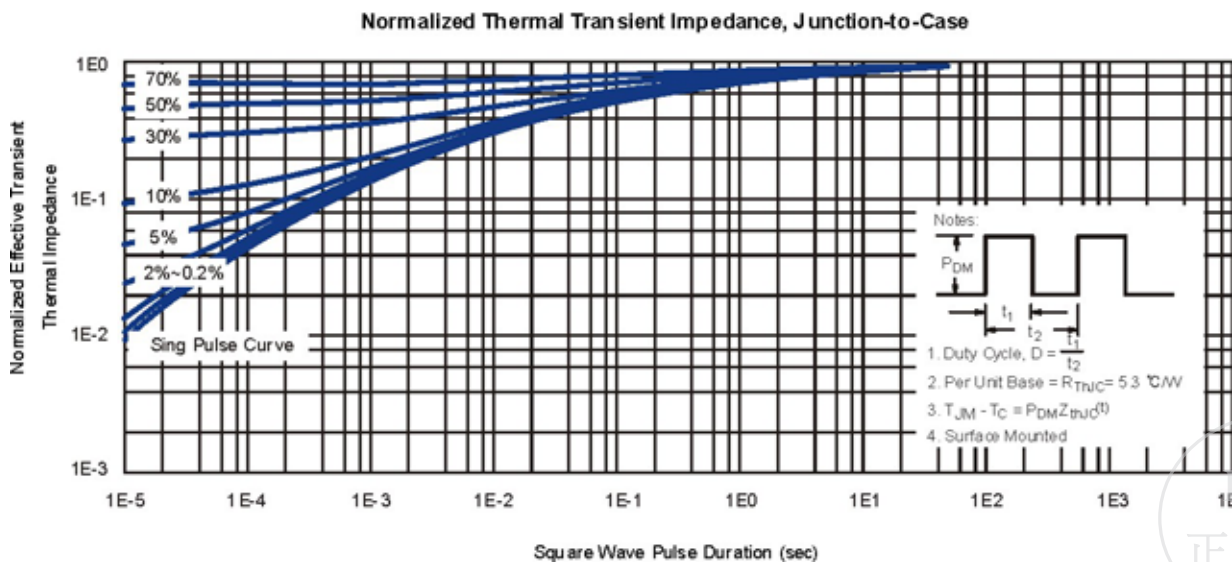
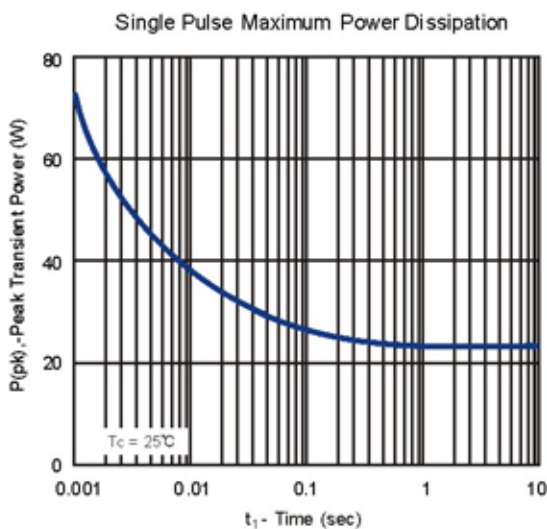
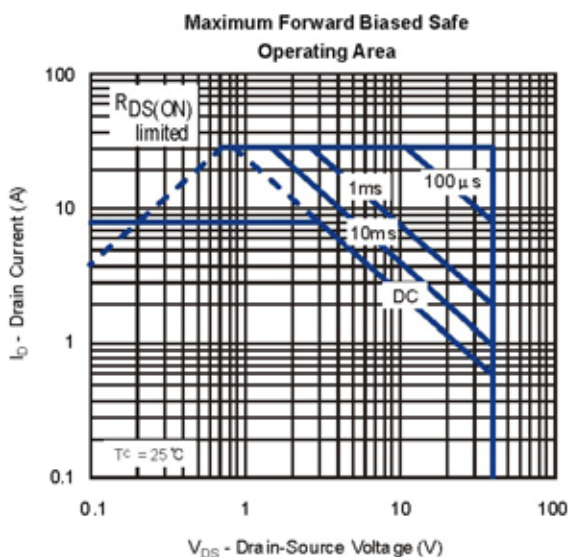
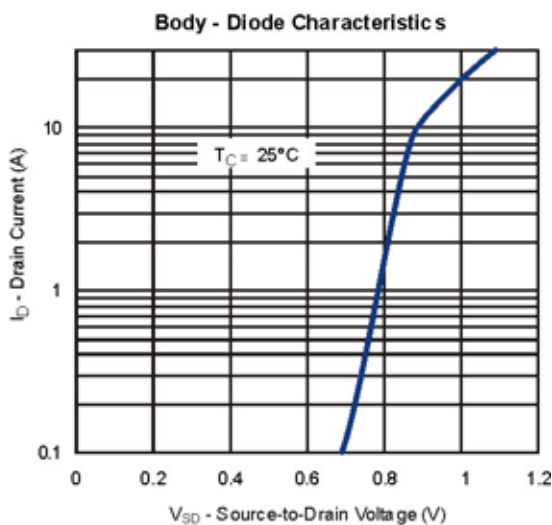
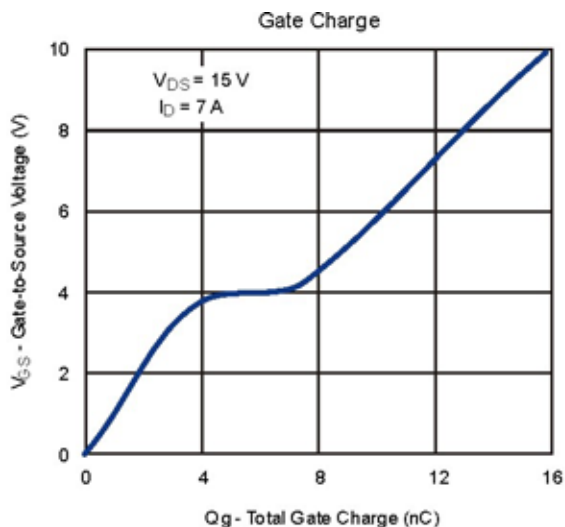
N-CHANNEL



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Typical Characteristics (T_J = 25 °C Noted)

N-CHANNEL

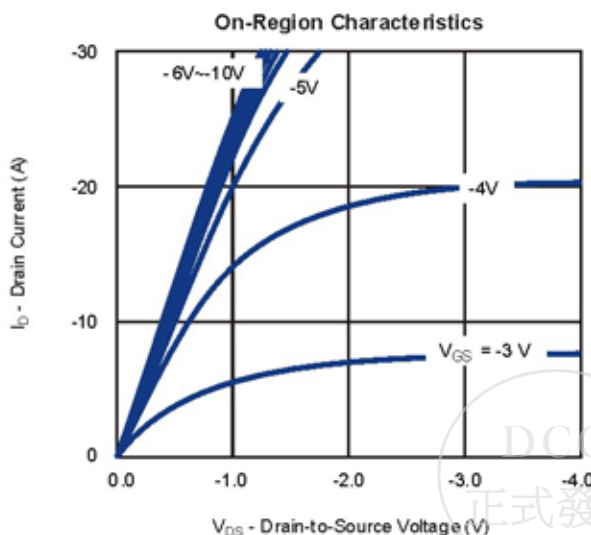
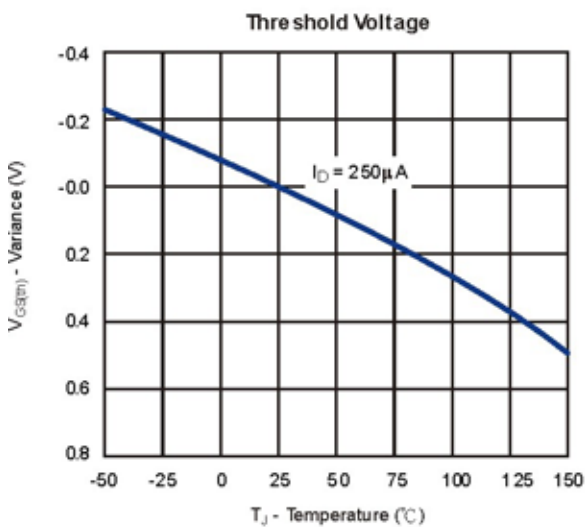
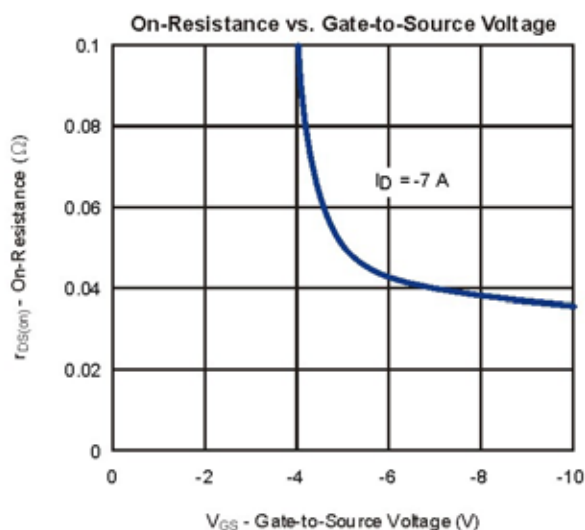
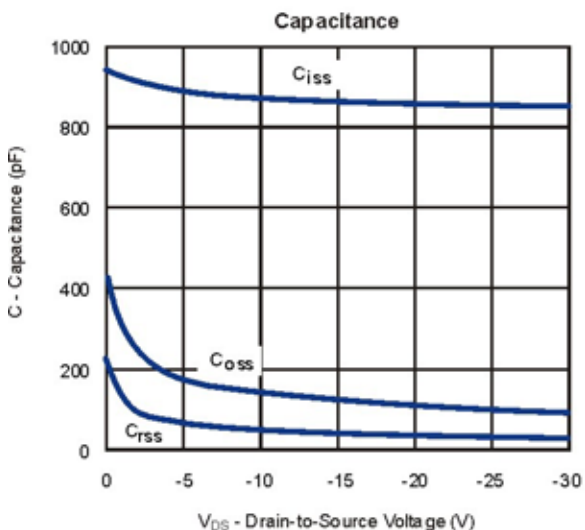
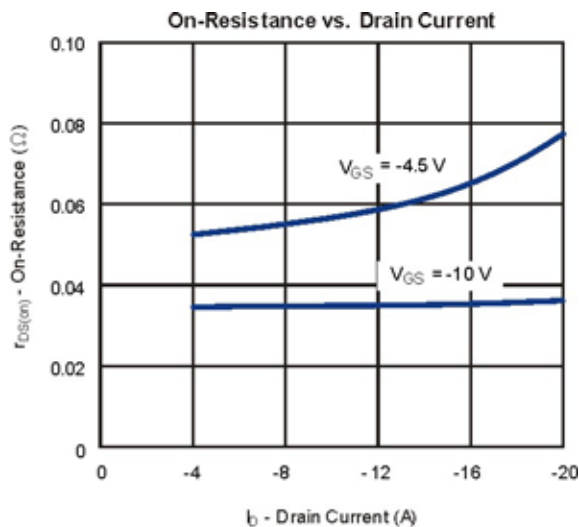
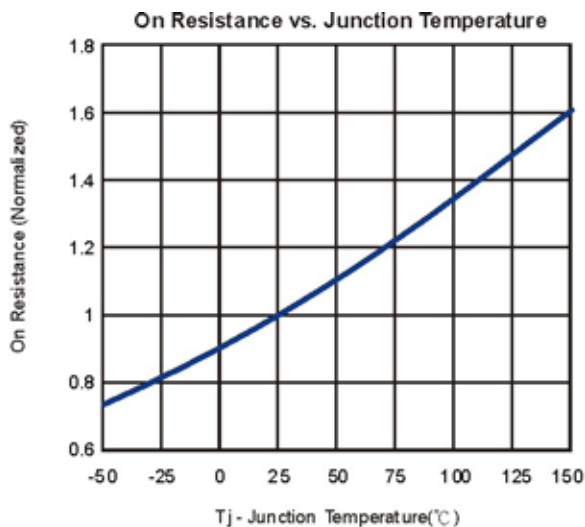


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N- and P-Channel 40-V (D-S) MOSFET

Typical Characteristics (T_J =25 Noted)

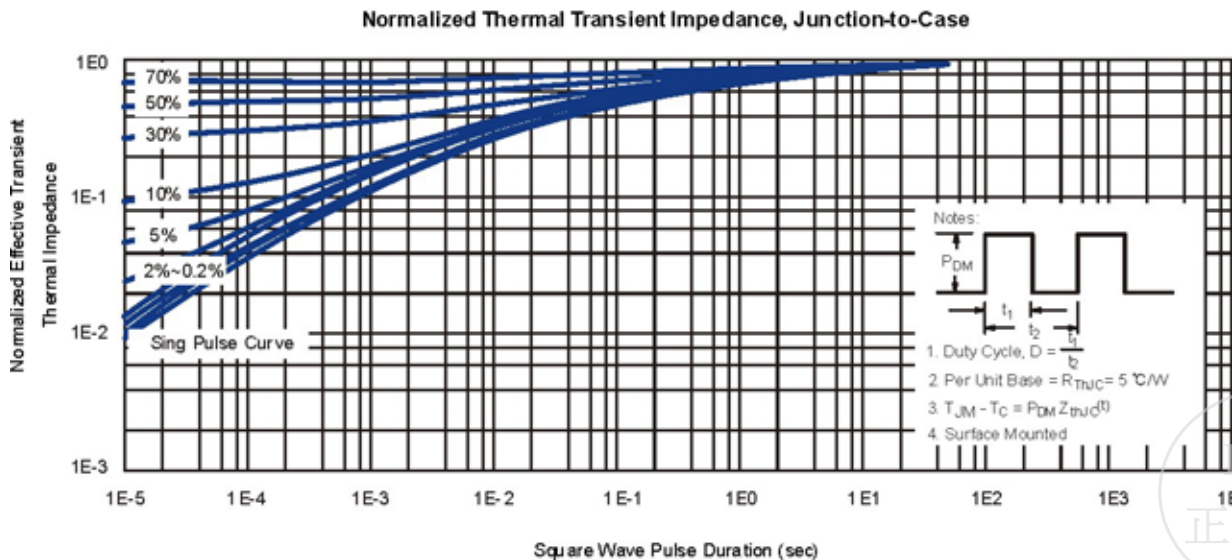
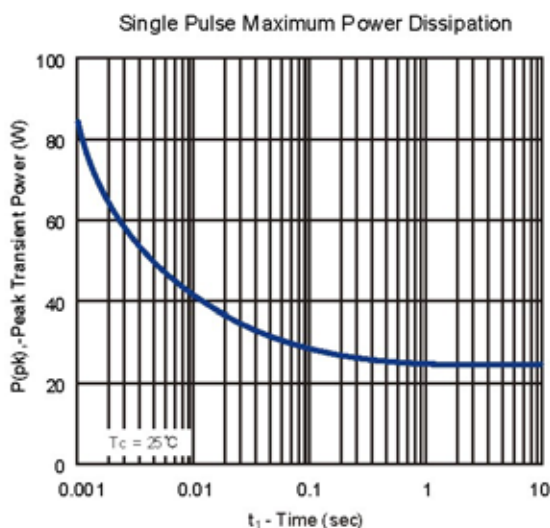
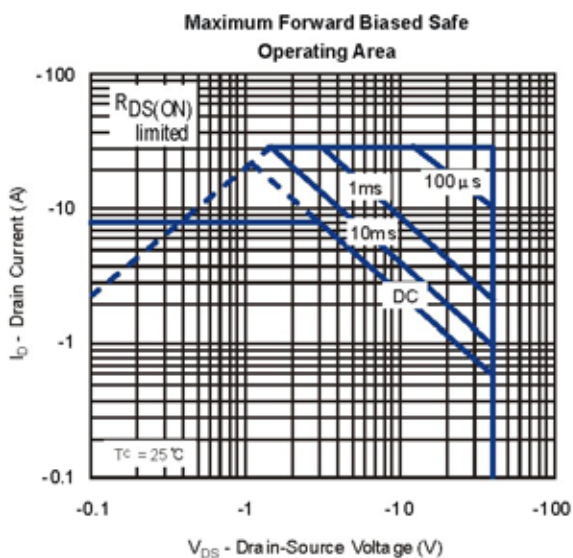
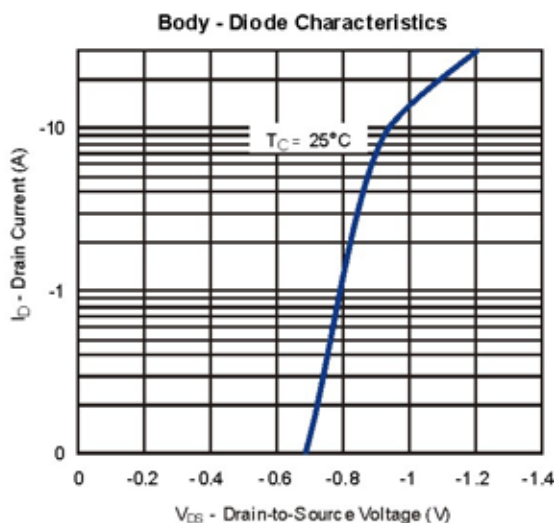
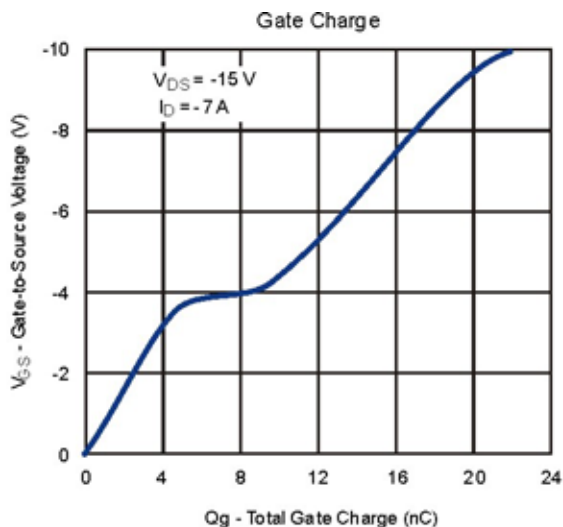
P-CHANNEL



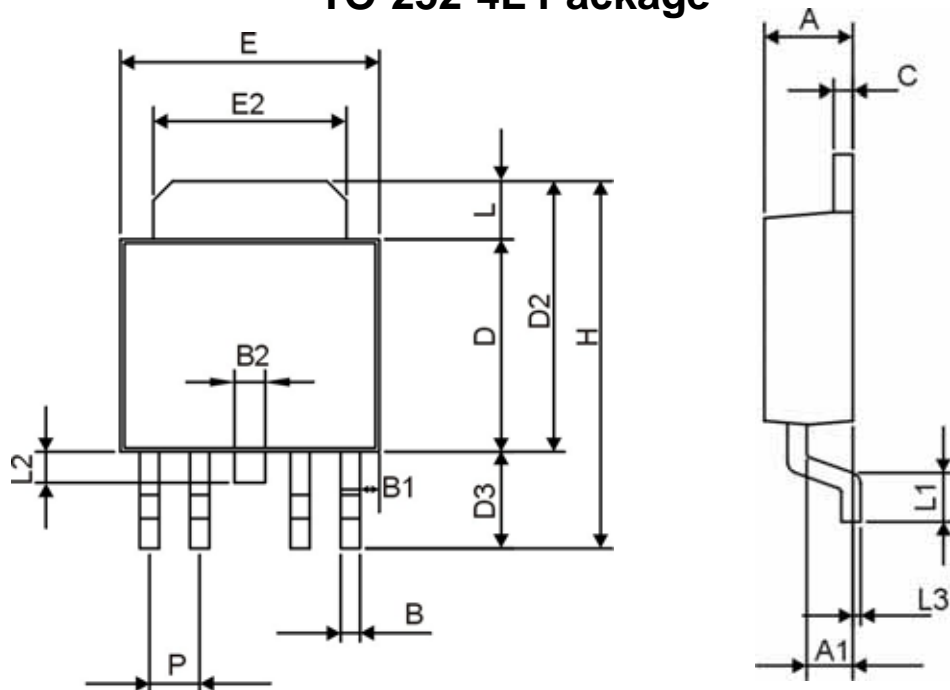
N- and P-Channel 40-V (D-S) MOSFET

Typical Characteristics (T_J = 25 °C Noted)

P-CHANNEL



TO-252-4L Package



| DIM | MILLIMETERS (mm) | |
|-----|------------------|-------|
| | MIN | MAX |
| A | 2.20 | 2.50 |
| A1 | 1.10 | 1.30 |
| B | 0.30 | 0.75 |
| B1 | 0.55 | 0.75 |
| B2 | 0.40 | 0.80 |
| C | 0.40 | 0.60 |
| D | 5.20 | 5.70 |
| D2 | 6.50 | 7.30 |
| D3 | 2.20 | 3.00 |
| E | 6.30 | 6.70 |
| E2 | 4.50 | 5.50 |
| H | 9.50 | 10.50 |
| L | 1.30 | 1.70 |
| L1 | 0.90 | 1.70 |
| L2 | 0.50 | 1.10 |
| L3 | 0.00 | 0.30 |
| P | 1.20 | 1.40 |

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