

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

DESCRIPTION

The 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.

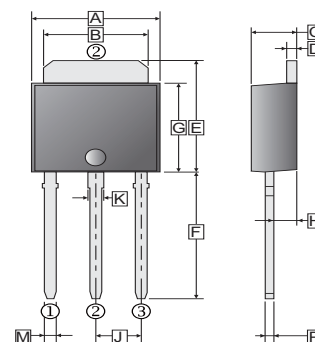
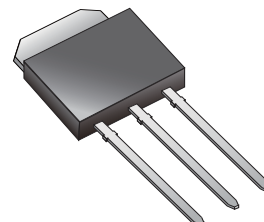
FEATURES

- Low R_{DS(on)} provides higher efficiency and extends battery life.
- Miniature SC-59 surface mount package saves board space.
- Fast switching speed.
- High performance trench technology.

APPLICATION

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

TO-251P



| REF. | Millimeter | | REF. | Millimeter | |
|------|------------|------|------|------------|------|
| | Min. | Max. | | Min. | Max. |
| A | 6.40 | 6.80 | G | 6.00 | 6.30 |
| B | 5.20 | 5.50 | H | 0.90 | 1.50 |
| C | 2.20 | 2.40 | J | 2.30 | |
| D | 0.40 | 0.60 | K | 0.60 | 0.90 |
| E | 6.80 | 7.20 | M | 0.70 | 1.20 |
| F | 4.00 | | P | 0.40 | 0.60 |

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

| Parameter | Symbol | Rating | Unit |
|---|-----------------------------------|-----------|--------|
| Drain-Source Voltage | V _{DS} | 60 | V |
| Gate-Source Voltage | V _{GS} | ±20 | V |
| Continuous Drain Current ¹ | I _D | 19 | A |
| Pulsed Drain Current ² | I _{DM} | 40 | A |
| Continuous Source Current (Diode Conduction) ¹ | I _S | 30 | A |
| Power Dissipation ¹ | P _D | 50 | W |
| Operating Junction and Storage Temperature Range | T _J , T _{STG} | -55 ~ 175 | °C |
| Thermal Resistance Data | | | |
| Maximum Junction to Ambient ¹ | R _{θJA} | 50 | °C / W |
| Maximum Junction to Case | R _{θJC} | 3 | |

Notes:

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

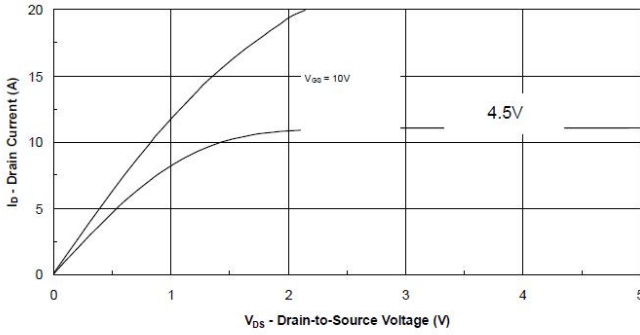
ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise specified)

| Parameter | Symbol | Min | Typ | Max | Unit | Test conditions |
|---|---------------------|-----|-----|------|------|---|
| Static | | | | | | |
| Gate-Threshold Voltage | V _{GS(th)} | 1 | - | - | V | V _{DS} =V _{GS} , I _D =250μA |
| Gate-Body Leakage | I _{GSS} | - | - | ±100 | nA | V _{DS} =0, V _{GS} =20V |
| Zero Gate Voltage Drain Current | I _{DSS} | - | - | 1 | μA | V _{DS} =48V, V _{GS} =0 |
| | | - | - | 25 | | V _{DS} =48V, V _{GS} =0, T _J =55°C |
| On-State Drain Current ¹ | I _{D(ON)} | 30 | - | - | A | V _{DS} =5V, V _{GS} =10V |
| Drain-Source On-Resistance ¹ | R _{DS(ON)} | - | - | 94 | mΩ | V _{GS} =10V, I _D =19A |
| | | - | - | 109 | | V _{GS} =4.5V, I _D =18A |
| Forward Transconductance ¹ | g _{FS} | - | 22 | - | S | V _{DS} =15V, I _D =19A |
| Diode Forward Voltage | V _{SD} | - | 1.1 | - | V | I _S =24A, V _{GS} =0 |
| Dynamic ² | | | | | | |
| Total Gate Charge | Q _g | - | 3.6 | - | nC | I _D =19A V _{DS} =15V V _{GS} =4.5V |
| Gate-Source Charge | Q _{gs} | - | 1.8 | - | | |
| Gate-Drain Charge | Q _{gd} | - | 1.3 | - | | |
| Turn-On Delay Time | T _{d(ON)} | - | 16 | - | nS | V _{DD} =25V V _{GEN} =10V R _L =25Ω I _D =24A |
| Rise Time | T _r | - | 5 | - | | |
| Turn-Off Delay Time | T _{d(OFF)} | - | 23 | - | | |
| Fall Time | T _f | - | 3 | - | | |
| Source-Drain Reverse Recovery Time | T _{rr} | - | 50 | - | nS | I _F =24A, Di/Dt=100A/μS |

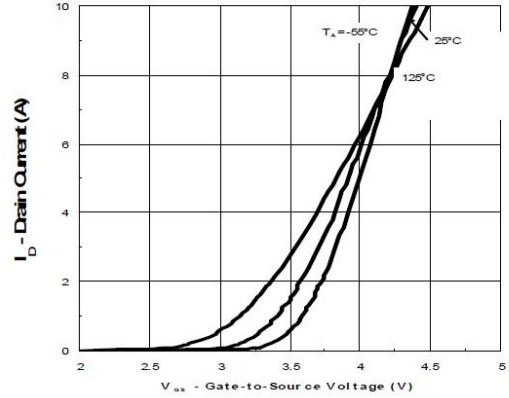
Notes:

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

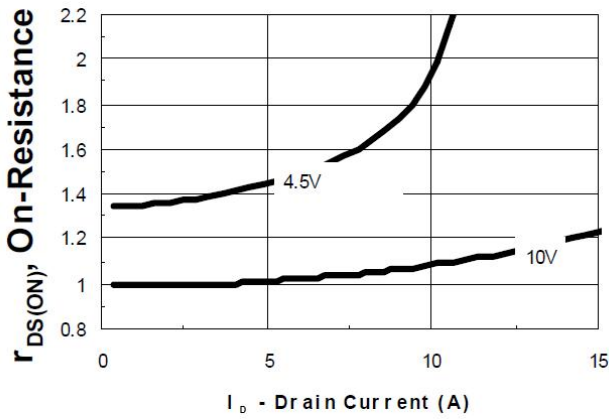
CHARACTERISTIC CURVE



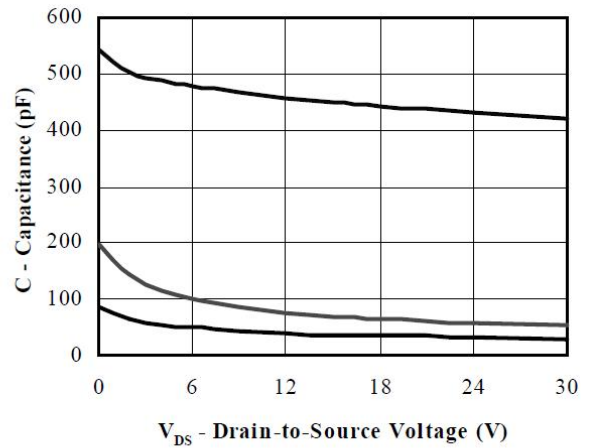
Output Characteristics



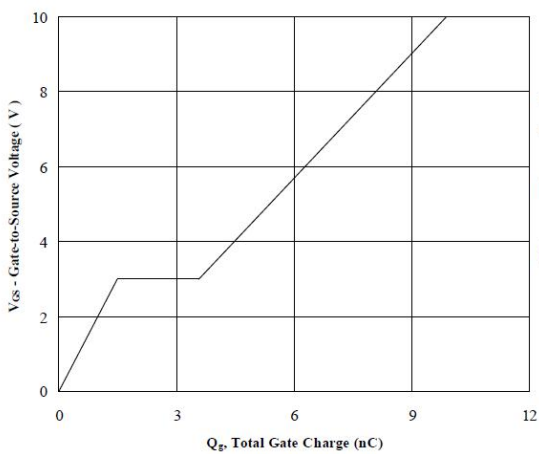
Transfer Characteristics



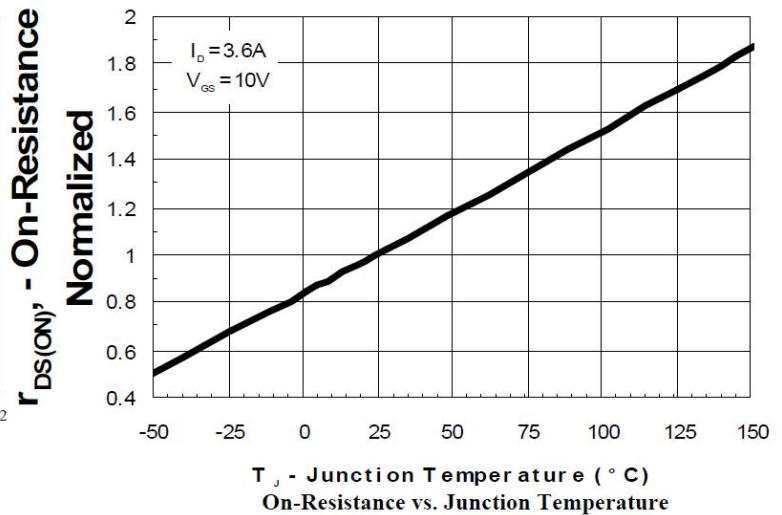
On-Resistance vs. Drain Current



Capacitance

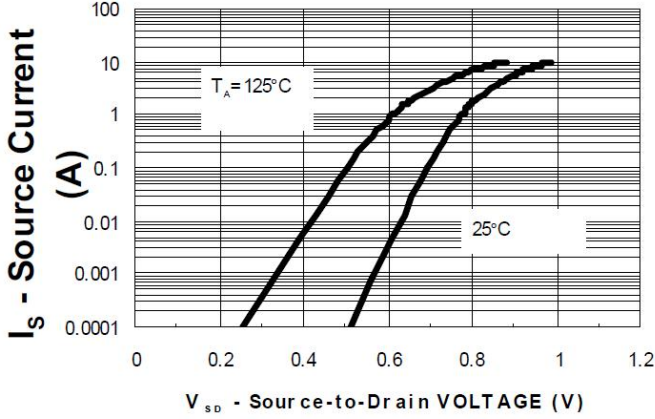


Gate Charge

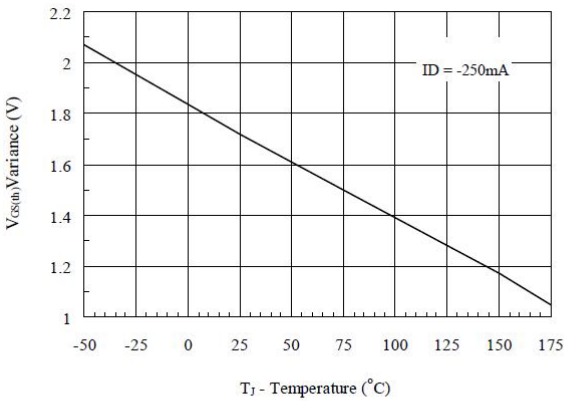


On-Resistance vs. Junction Temperature

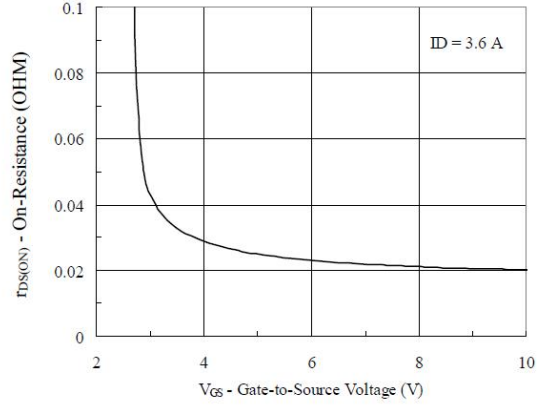
CHARACTERISTIC CURVE



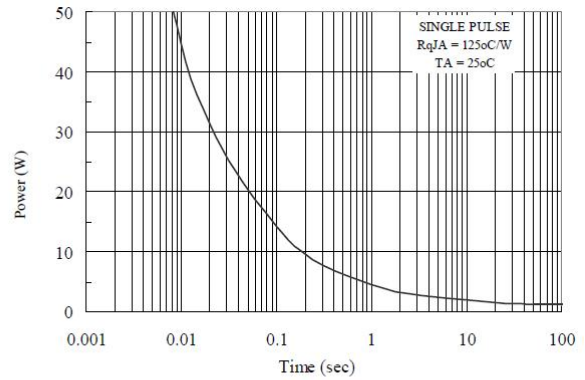
Source-Drain Diode Forward Voltage



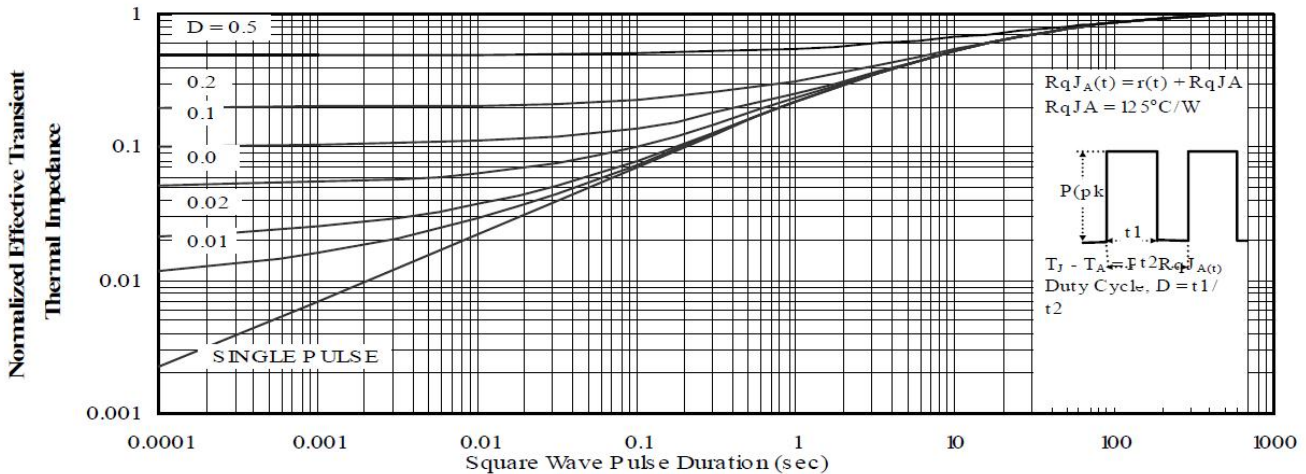
Threshold Voltage



On-Resistance vs. Gate-to-Source Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient