

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

DESCRIPTION

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

FEATURES

- Low $R_{DS(on)}$ Trench Technology
- Low Thermal Impedance
- Fast Switching Speed

APPLICATIONS

- Battery-Powered Instruments
- Portable Computing
- Mobile Phones
- GPS Units and Media Players

MARKING



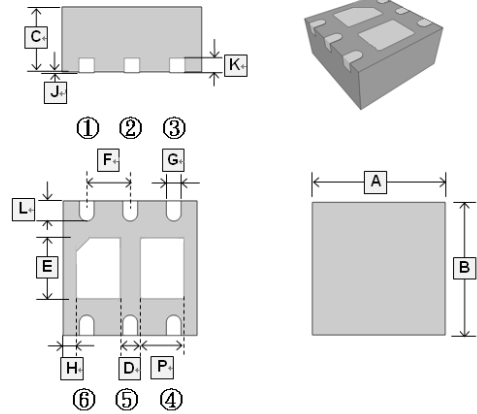
PACKAGE INFORMATION

| Package | MPQ | Leader Size |
|-------------|-----|-------------|
| DFN2x2-6L-J | 3K | 7 inch |

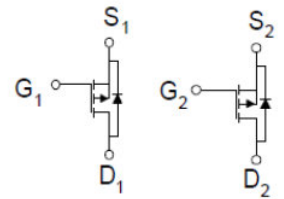
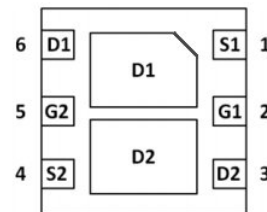
ORDER INFORMATION

| Part Number | Type |
|-------------|---------------------------------|
| SDT2P02-C | Lead (Pb)-free and Halogen-free |

DFN2x2-6L-J



| REF. | Millimeter | | REF. | Millimeter | |
|------|------------|------|------|------------|------|
| | Min. | Max. | | Min. | Max. |
| A | 1.90 | 2.10 | G | 0.25 | 0.35 |
| B | 1.90 | 2.10 | H | 0.20 BSC. | |
| C | 0.675 | 0.80 | J | - | 0.06 |
| D | 0.25 | 0.35 | K | 0.15 | 0.25 |
| E | 0.75 | 1.10 | L | 0.20 | 0.38 |
| F | 0.65 TYP. | | P | 0.52 | 0.72 |



P-Channel MOSFET

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

| Parameter | Symbol | Ratings | Unit |
|---|------------------------|--------------------|--------------------|
| Drain-Source Voltage | V_{DS} | -20 | V |
| Gate-Source Voltage | V_{GS} | ± 8 | V |
| Continuous Drain Current @ $V_{GS} = -4.5V$ ¹ | $T_A=25^\circ\text{C}$ | -2.2 | A |
| | $T_A=70^\circ\text{C}$ | -1.7 | |
| Pulsed Drain Current ² | I_{DM} | -8.8 | A |
| Power Dissipation ¹ | P_D | 1.5 | W |
| Operating Junction & Storage Temperature Range | T_J, T_{STG} | -55~150 | $^\circ\text{C}$ |
| Thermal Resistance Ratings | | | |
| Maximum Thermal Resistance from Junction-Ambient ¹ | $R_{\theta JA}$ | $t \leq 5$ sec, 83 | $^\circ\text{C/W}$ |
| | | Steady State, 125 | |

ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|---|--------------|------|-------|-----------|---------------|--|
| Drain-Source Breakdown Voltage | BV_{DSS} | -20 | - | - | V | $V_{GS}=0, I_D = -250\mu\text{A}$ |
| Gate-Threshold Voltage | $V_{GS(th)}$ | -0.5 | - | -1 | V | $V_{DS}=V_{GS}, I_D = -250\mu\text{A}$ |
| Forward Transconductance | g_{fs} | - | 3.4 | - | S | $V_{DS} = -5\text{V}, I_D = -2\text{A}$ |
| Gate-Body Leakage Current | I_{GSS} | - | - | ± 100 | nA | $V_{DS}=0, V_{GS} = \pm 8\text{V}$ |
| Zero Gate Voltage Drain Current | I_{DSS} | - | - | -1 | μA | $V_{DS} = -16\text{V}, V_{GS}=0, T_J=25^\circ\text{C}$ |
| | | - | - | -10 | | $V_{DS} = -16\text{V}, V_{GS}=0, T_J=55^\circ\text{C}$ |
| Drain-Source On-Resistance ³ | $R_{DS(ON)}$ | - | 170 | 200 | m Ω | $V_{GS} = -4.5\text{V}, I_D = -2\text{A}$ |
| | | - | 240 | 280 | | $V_{GS} = -2.5\text{V}, I_D = -1.5\text{A}$ |
| Total Gate Charge ³ | Q_g | - | 4.6 | - | nC | $V_{DS} = -20\text{V}$ $V_{GS} = -4.5\text{V}$ $I_D = -2\text{A}$ |
| Gate-Source Charge | Q_{gs} | - | 0.27 | - | | |
| Gate-Drain Charge | Q_{gd} | - | 2.34 | - | | |
| Turn-On Delay Time ³ | $T_{d(on)}$ | - | 11.6 | - | nS | $V_{DD} = -12\text{V}$ $V_{GS} = -4.5\text{V}$ $R_G = 3.3\Omega$ $I_D = -1\text{A}$ |
| Rise Time | T_r | - | 6.2 | - | | |
| Turn-Off Delay Time | $T_{d(off)}$ | - | 31.8 | - | | |
| Fall Time | T_f | - | 2.8 | - | | |
| Input Capacitance | C_{iss} | - | 194 | - | pF | $V_{DS} = -15\text{V}$ $V_{GS} = 0$ $f = 1\text{MHz}$ |
| Output Capacitance | C_{oss} | - | 35.5 | - | | |
| Reverse Transfer Capacitance | C_{rss} | - | 28.2 | - | | |
| Source-Drain Diode | | | | | | |
| Diode Forward Voltage ³ | V_{SD} | - | -0.85 | -1.3 | V | $I_S = -0.9\text{A}, V_{GS} = 0$ |
| Continuous Source Current ¹ | I_S | - | - | -2.2 | mA | $V_G = V_D = 0\text{V}, \text{Force Current}$ |
| Pulsed Source Current ³ | I_{SM} | - | - | -8.8 | mA | |

Notes:

1. The surface of the device is mounted on a 1" x 1" FR4 board with 2OZ copper.
2. Pulse width is limited by the maximum junction temperature.
3. Pulse test: Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

CHARACTERISTIC CURVE

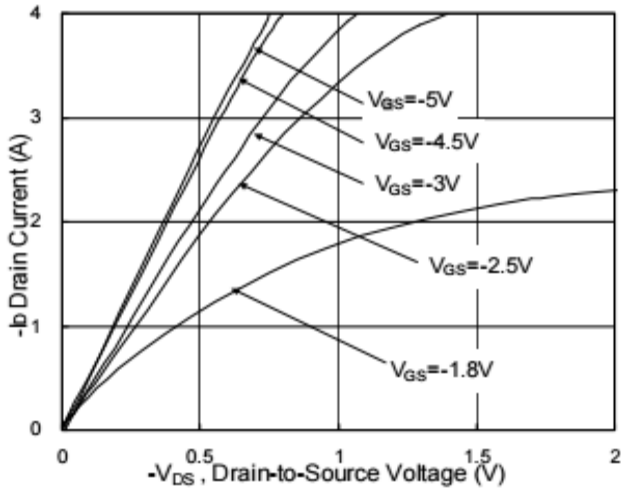


Fig.1 Typical Output Characteristics

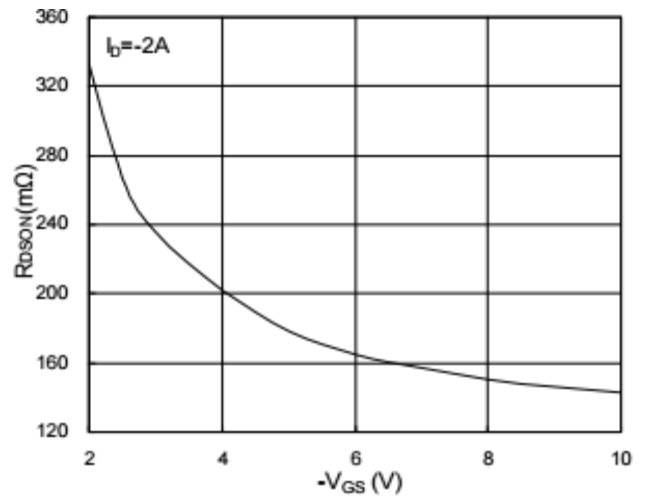


Fig.2 On-Resistance vs. Gate-Source

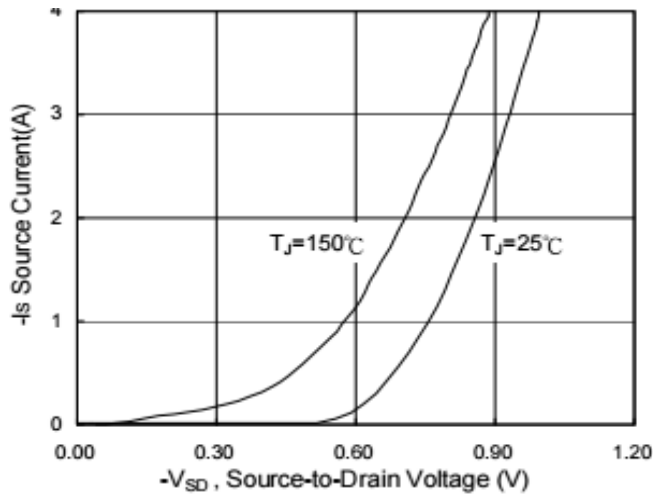


Fig.3 Forward Characteristics Of Reverse

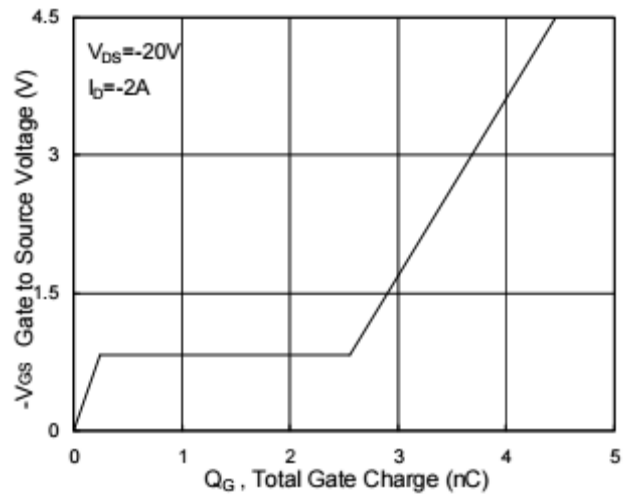


Fig.4 Gate-Charge Characteristics

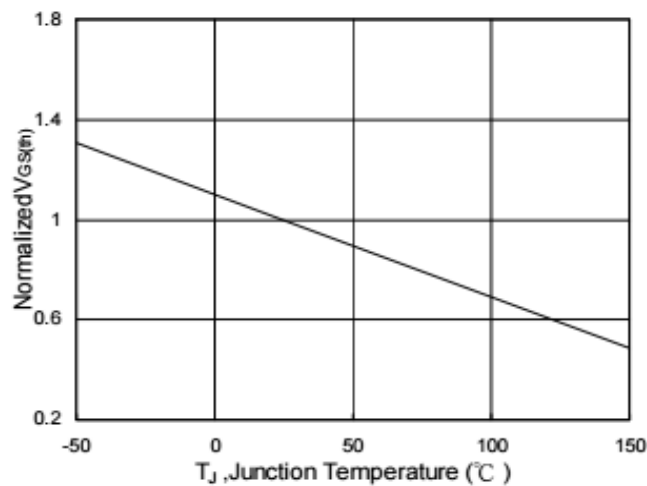


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

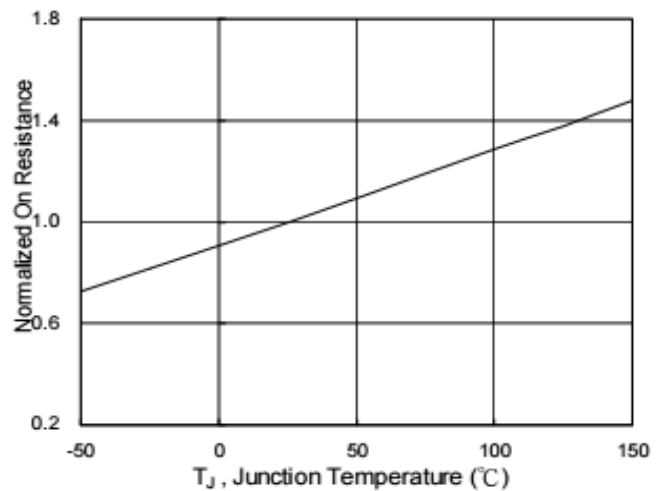


Fig.6 Normalized $R_{DS(ON)}$ vs. T_J

CHARACTERISTIC CURVE

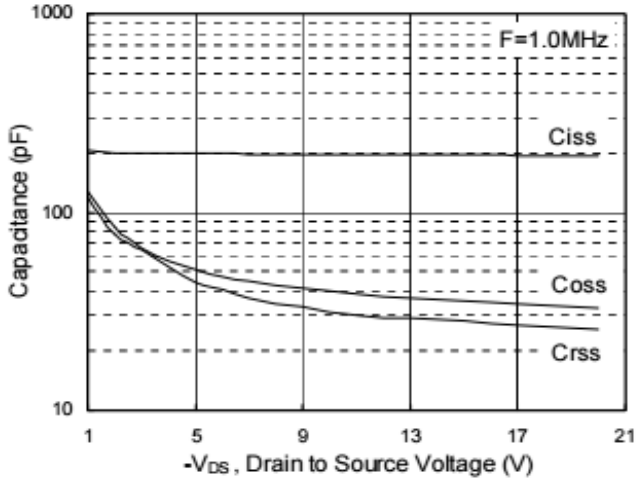


Fig.7 Capacitance

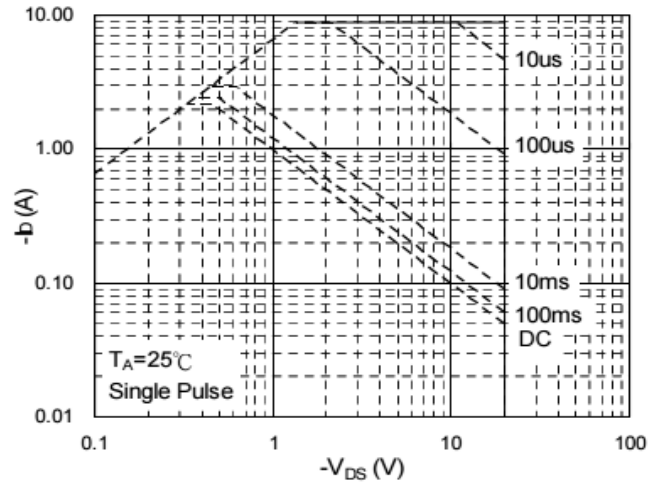


Fig.8 Safe Operating Area

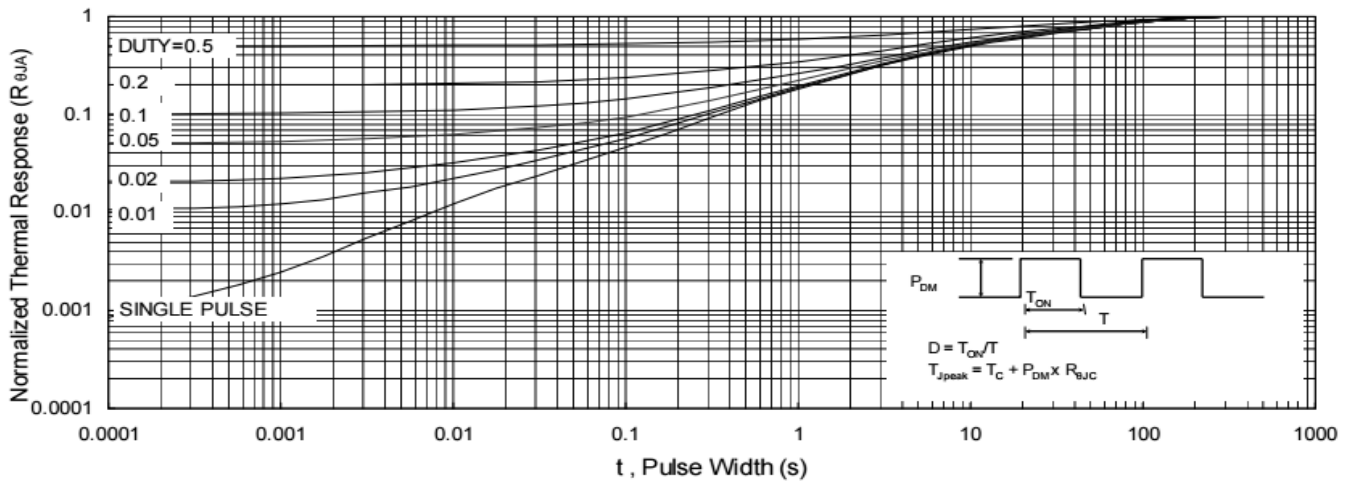


Fig.9 Normalized Maximum Transient Thermal Impedance

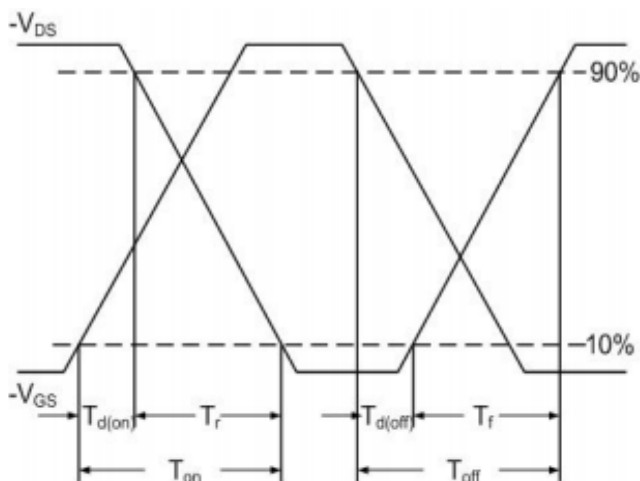


Fig.10 Switching Time Waveform

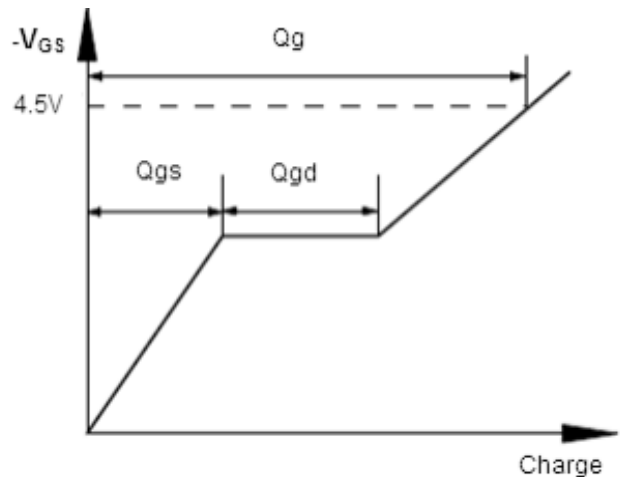


Fig.11 Gate Charge Waveform