

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

FEATURES

- 20V/760mA
 $R_{DS(ON)} \leq 450m\Omega @ V_{GS}=4.5V$
 $R_{DS(ON)} \leq 650m\Omega @ V_{GS}=2.5V$
 $R_{DS(ON)} \leq 1300m\Omega @ V_{GS}=1.8V$
- Reliable and Rugged
- Green Device Available
- ESD Protection

MARKING

20K

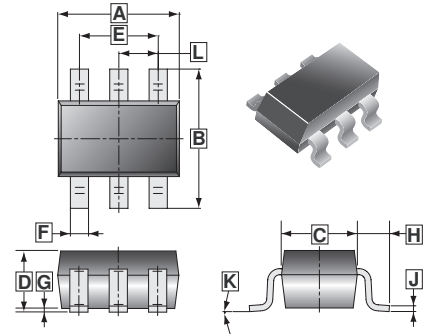
PACKAGE INFORMATION

| Package | MPQ | Leader Size |
|---------|-----|-------------|
| SOT-363 | 3K | 7 inch |

ORDER INFORMATION

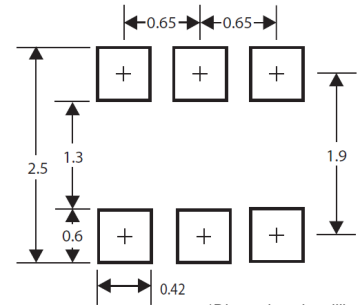
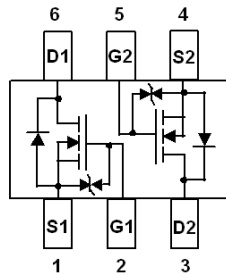
| Part Number | Type |
|-------------|---------------------------------|
| SUM20K8NE-C | Lead (Pb)-free and Halogen-free |

SOT-363



| REF. | Millimeter | | REF. | Millimeter | |
|------|------------|------|------|------------|------|
| | Min. | Max. | | Min. | Max. |
| A | 1.80 | 2.20 | G | 0.100 REF. | |
| B | 1.80 | 2.45 | H | 0.525 REF. | |
| C | 1.15 | 1.35 | J | 0.08 | 0.25 |
| D | 0.80 | 1.10 | K | 8° | |
| E | 1.10 | 1.50 | L | 0.650 TYP. | |
| F | 0.10 | 0.35 | | | |

Mounting Pad Layout



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} | ± 12 | V |
| Continuous Drain Current @ $V_{GS}=4.5V$ ¹ | I_D | $T_A=25^\circ\text{C}$ | 0.76 |
| | | $T_A=85^\circ\text{C}$ | 0.55 |
| Pulsed Drain Current ³ | I_{DM} | 3 | A |
| Power Dissipation | P_D | 300 | mW |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | 150, -55~150 | $^\circ\text{C}$ |
| Thermal Data | | | |
| Maximum Junction to Ambient ¹ | $R_{\theta JA}$ | 417 | $^\circ\text{C/W}$ |
| Maximum Junction to Ambient ² | | 625 | |
| Maximum Junction to Case | $R_{\theta JC}$ | 300 | |

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

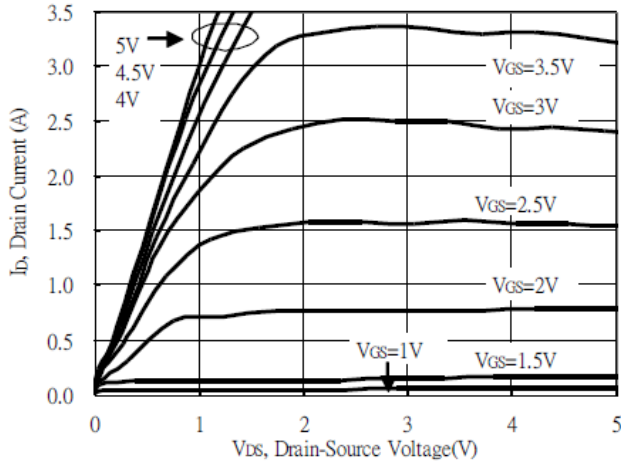
| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|--------------|------|------|----------|---------------|---|
| Drain-Source Breakdown Voltage | BV_{DSS} | 20 | - | - | V | $I_D=250\mu\text{A}$, $V_{GS}=0$ |
| Gate-Threshold Voltage | $V_{GS(th)}$ | 0.45 | - | 1.2 | V | $V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$ |
| Gate-Source Leakage Current | I_{GSS} | - | - | ± 10 | μA | $V_{GS}=\pm 10\text{V}$ |
| Drain-Source Leakage Current | I_{DSS} | - | - | 1 | μA | $V_{DS}=20\text{V}$, $V_{GS}=0$, $T_J=25^\circ\text{C}$ |
| Drain-Source Leakage Current | I_{DSS} | - | - | 10 | μA | $V_{DS}=16\text{V}$, $V_{GS}=0$, $T_J=70^\circ\text{C}$ |
| Drain-Source On-Resistance ⁴ | $R_{DS(ON)}$ | - | - | 450 | m Ω | $V_{GS}=4.5\text{V}$, $I_D=600\text{mA}$ |
| | | - | - | 650 | | $V_{GS}=2.5\text{V}$, $I_D=400\text{mA}$ |
| | | - | - | 1300 | | $V_{GS}=1.8\text{V}$, $I_D=350\text{mA}$ |
| Total Gate Charge | Q_g | - | 1.3 | - | nC | $I_{DS}=0.6\text{A}$, $V_{DS}=16\text{V}$, $V_{GS}=4.5\text{V}$ |
| Gate-Source Charge | Q_{gs} | - | 0.3 | - | | |
| Gate-Drain ("Miller") Charge | Q_{gd} | - | 0.5 | - | | |
| Turn-on Delay Time | $T_{d(on)}$ | - | 4 | - | nS | $V_{DD}=10\text{V}$, $V_{GS}=10\text{V}$, $I_{DS}=0.6\text{A}$, $R_{GEN}=3.3\Omega$ |
| Rise Time | T_r | - | 10 | - | | |
| Turn-off Delay Time | $T_{d(off)}$ | - | 15 | - | | |
| Fall Time | T_f | - | 2 | - | | |
| Input Capacitance | C_{iss} | - | 60 | - | pF | $V_{DS}=10\text{V}$, $V_{GS}=0$, $f=1\text{MHz}$ |
| Output Capacitance | C_{oss} | - | 14 | - | | |
| Reverse Transfer Capacitance | C_{rss} | - | 9 | - | | |
| Source-Drain Diode | | | | | | |
| Continuous Source Current ¹ | I_S | - | - | 0.76 | A | |
| Pulsed Source Current ³ | I_{SM} | - | - | 3 | A | |
| Diode Forward Voltage ⁴ | V_{SD} | - | - | 1.2 | V | $I_S=500\text{mA}$, $V_{GS}=0\text{V}$ |
| Reverse Recovery Time | t_{rr} | - | 4.9 | - | nS | $I_F=0.5\text{A}$, $dI/dt=100\text{A}/\mu\text{s}$, $T_J=25^\circ\text{C}$ |
| Reverse Recovery Charge | Q_{rr} | - | 1.0 | - | nC | |

Notes

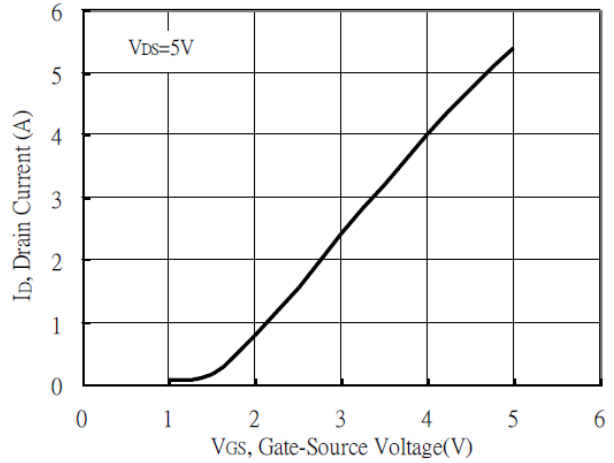
1. Surface mounted on a 1 inch² FR-4 board with 2oz copper, $t \leq 10\text{sec}$.
2. Surface mounted on FR-4 board.
3. Pulse width limited by maximum junction temperature, $P_w \leq 300\mu\text{s}$, Duty cycle $\leq 1\%$.
4. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

CHARACTERISTIC CURVES

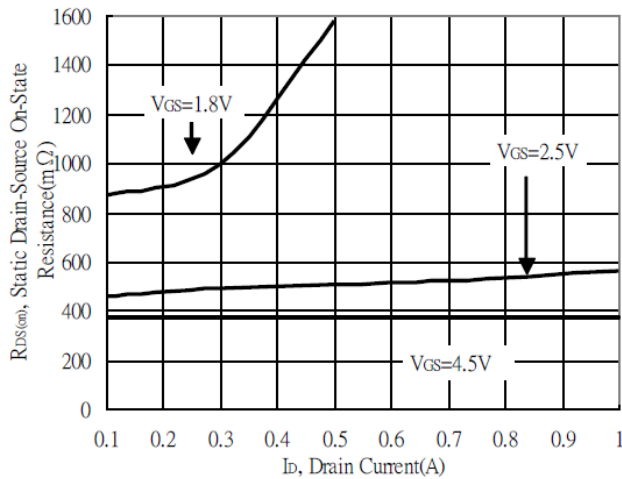
Typical Output Characteristics



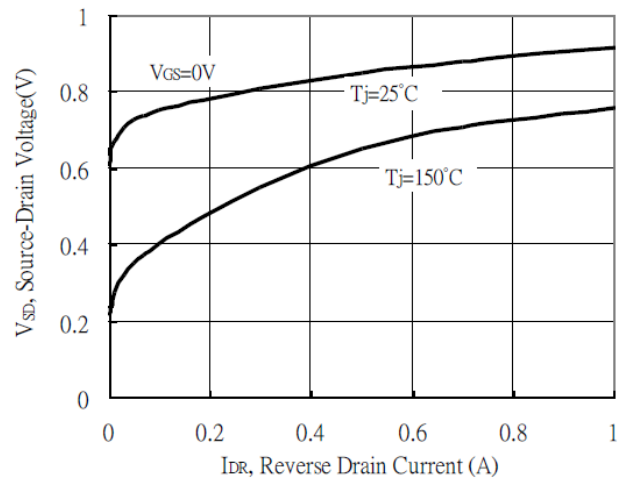
Typical Transfer Characteristics



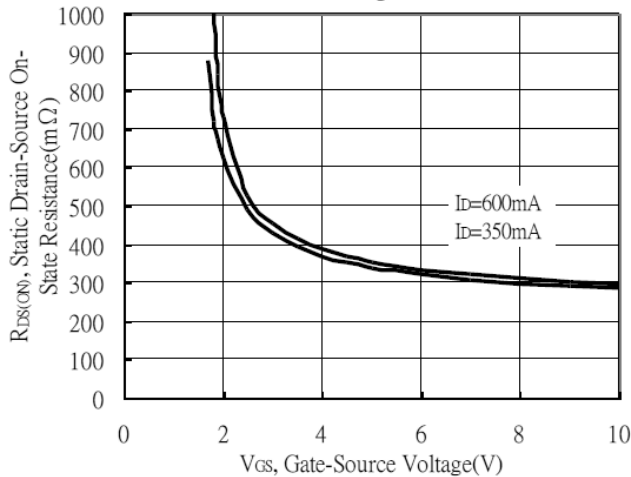
Static Drain-Source On-State resistance vs Drain Current



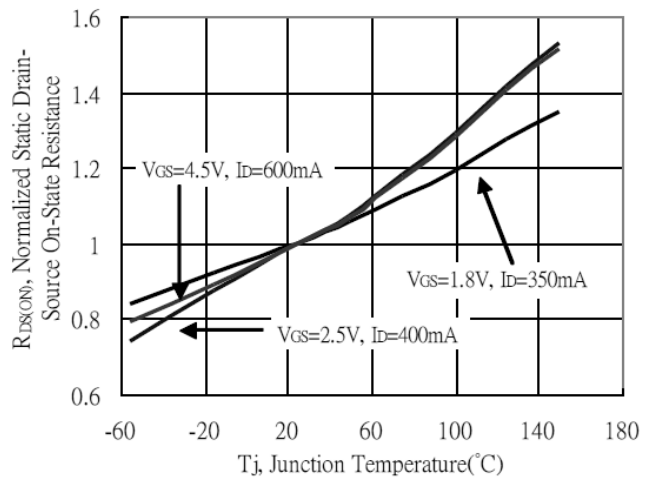
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

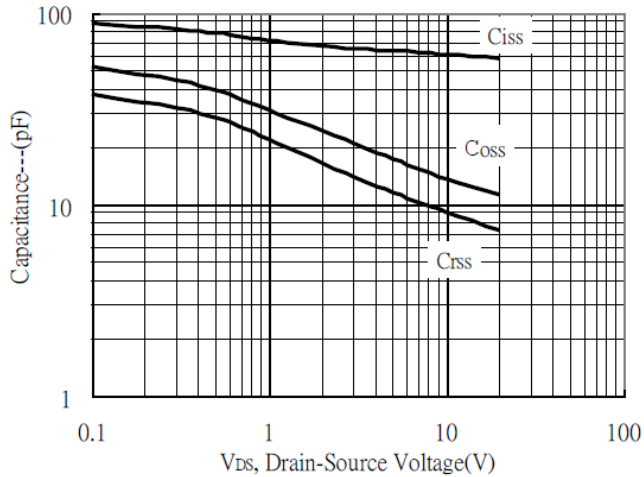


Drain-Source On-State Resistance vs Junction Temperature

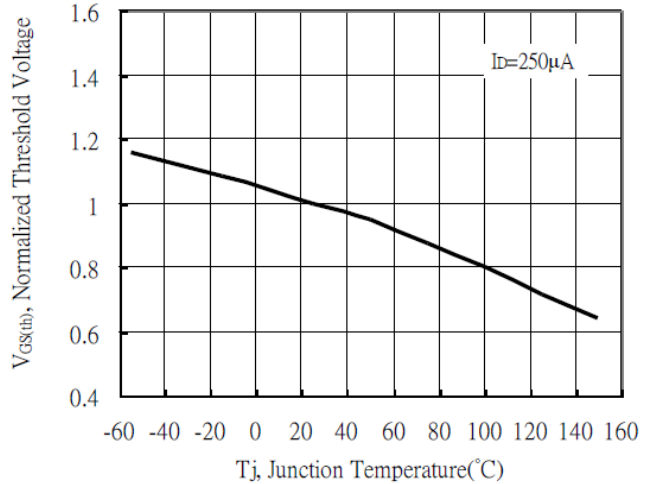


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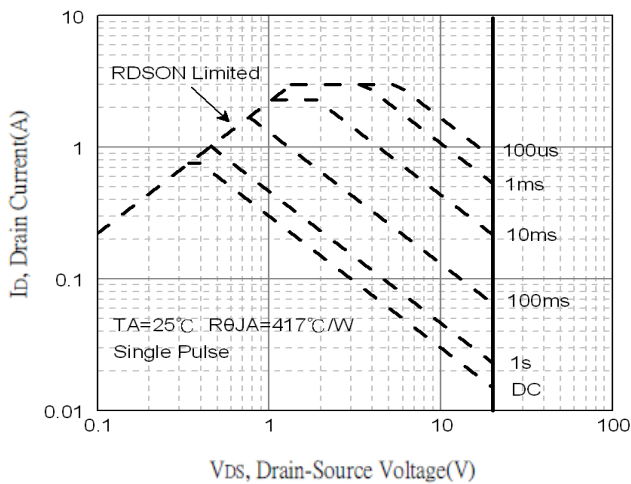
Capacitance vs Drain-to-Source Voltage



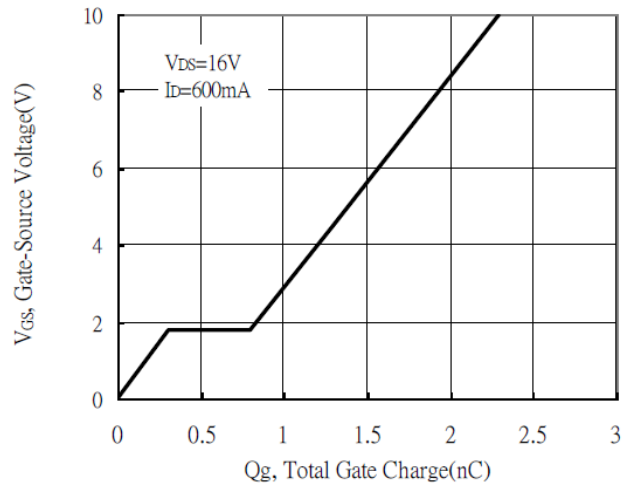
Threshold Voltage vs Junction Temperature



Maximum Safe Operating Area



Gate Charge Characteristics



Transient Thermal Response Curves

