

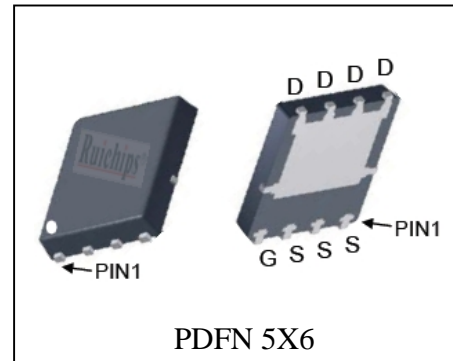
Features

- 30V/70A,
 $R_{DS(ON)} = 3.8m$ (tpy.)@ $V_{GS}=10V$
 $R_{DS(ON)} = 5m$ (tpy.)@ $V_{GS}=4.5V$
- Super High Dense Cell Design
- Reliable and Rugged
- 100% avalanche tested
- Lead Free and Green Devices Available (RoHS Compliant)

Applications

- DC/DC Conversion
- Switching Application

Pin Description



Absolute Maximum Ratings

| Symbol | Parameter | Rating | Unit |
|--|--|--------------------------------------|------------|
| Common Ratings ($T_C=25^\circ C$ Unless Otherwise Noted) | | | |
| V_{DSS} | Drain-Source Voltage | 30 | V |
| V_{GSS} | Gate-Source Voltage | ± 20 | |
| T_J | Maximum Junction Temperature | 150 | $^\circ C$ |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ C$ |
| I_S | Diode Continuous Forward Current | $T_C=25^\circ C$ 50 | A |
| Mounted on Large Heat Sink | | | |
| I_{DP} | 300 μs Pulse Drain Current Tested | $T_C=25^\circ C$ 280 ^② | A |
| I_D | Continuous Drain Current($V_{GS}=10V$) | $T_C=25^\circ C$ 70 ^① | A |
| | | $T_C=100^\circ C$ 52 ^① | |
| | | $T_A=25^\circ C$ 23 ^③ | |
| | | $T_A=70^\circ C$ 18 ^③ | |
| P_D | Maximum Power Dissipation | $T_C=25^\circ C$ 52 | W |
| | | $T_C=100^\circ C$ 21 | |
| | | $T_A=25^\circ C$ 4.2 ^③ | |
| | | $T_A=70^\circ C$ 2.7 ^③ | |

| Mounted on Large Heat Sink | | | |
|---------------------------------------|--|-----|------|
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | 2.4 | °C/W |
| $R_{\theta JA}^{(3)}$ | Thermal Resistance-Junction to Ambient | 30 | °C/W |
| Drain-Source Avalanche Ratings | | | |
| $E_{AS}^{(4)}$ | Avalanche Energy, Single Pulsed | 210 | mJ |

Electrical Characteristics ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)

| Symbol | Parameter | Test Condition | RU3070M | | | Unit |
|---|----------------------------------|--|---------|------|-----------|-----------|
| | | | Min. | Typ. | Max. | |
| Static Characteristics | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_{DS}=250\mu A$ | 30 | | | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=30V, V_{GS}=0V$ $T_J=85^\circ\text{C}$ | | | 1 30 | μA |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_{DS}=250\mu A$ | 1 | - | 2.5 | V |
| I_{GSS} | Gate Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | | | ± 100 | nA |
| $R_{DS(on)}^{(5)}$ | Drain-Source On-state Resistance | $V_{GS}=10V, I_{DS}=20A$ | | 3.8 | 5 | $m\Omega$ |
| | | $V_{GS}=4.5V, I_{DS}=20A$ | | 5 | 8 | $m\Omega$ |
| Diode Characteristics | | | | | | |
| $V_{SD}^{(5)}$ | Diode Forward Voltage | $I_{SD}=20A, V_{GS}=0V$ | | | 1.2 | V |
| t_{rr} | Reverse Recovery Time | $I_{SD}=20A, di_{SD}/dt=100A/\mu s$ | | 30 | | ns |
| Q_{rr} | Reverse Recovery Charge | | | 34 | | nC |
| Dynamic Characteristics ⁽⁶⁾ | | | | | | |
| R_G | Gate Resistance | $V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$ | | 1.8 | | Ω |
| C_{iss} | Input Capacitance | $V_{GS}=0V,$ $V_{DS}=15V,$ Frequency=1.0MHz | | 3270 | | pF |
| C_{oss} | Output Capacitance | | | 580 | | |
| C_{rss} | Reverse Transfer Capacitance | | | 285 | | |
| $t_{d(ON)}$ | Turn-on Delay Time | $V_{DD}=15V, R_L=0.75\Omega,$ $I_{DS}=20A, V_{GEN}=10V,$ $R_G=3\Omega$ | | 8 | | ns |
| t_r | Turn-on Rise Time | | | 12 | | |
| $t_{d(OFF)}$ | Turn-off Delay Time | | | 35 | | |
| t_f | Turn-off Fall Time | | | 9 | | |
| Gate Charge Characteristics ⁽⁶⁾ | | | | | | |
| Q_g | Total Gate Charge | $V_{DS}=24V, V_{GS}=10V,$ $I_{DS}=20A$ | | 60 | | nC |
| Q_{gs} | Gate-Source Charge | | | 15 | | |
| Q_{gd} | Gate-Drain Charge | | | 22 | | |

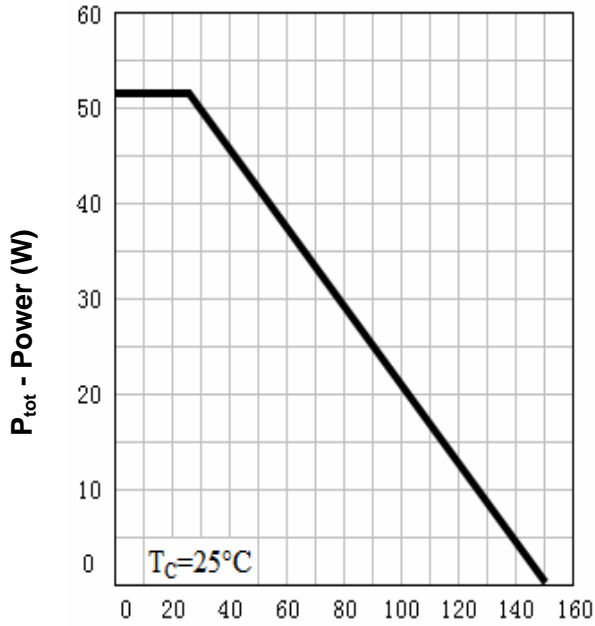
- Notes:
- ① Max current is limited to 50A by the package.
 - ② Pulse width limited by safe operating area.
 - ③ When mounted on 1 inch square copper board, $t \leq 10\text{sec}$.
 - ④ Limited by $T_{J\text{max}}$, $I_{AS} = 29\text{A}$, $V_{DD} = 24\text{V}$, $R_G = 50\Omega$, Starting $T_J = 25^\circ\text{C}$.
 - ⑤ Pulse test ; Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
 - ⑥ Guaranteed by design, not subject to production testing.

Ordering and Marking Information

| Device | Marking | Package | Packaging | Quantity | Reel Size | Tape width |
|---------|---------|----------|-----------|----------|-----------|------------|
| RU3070M | RU3070M | PDFN 5X6 | Tape&Reel | 3000 | 13'' | 12mm |

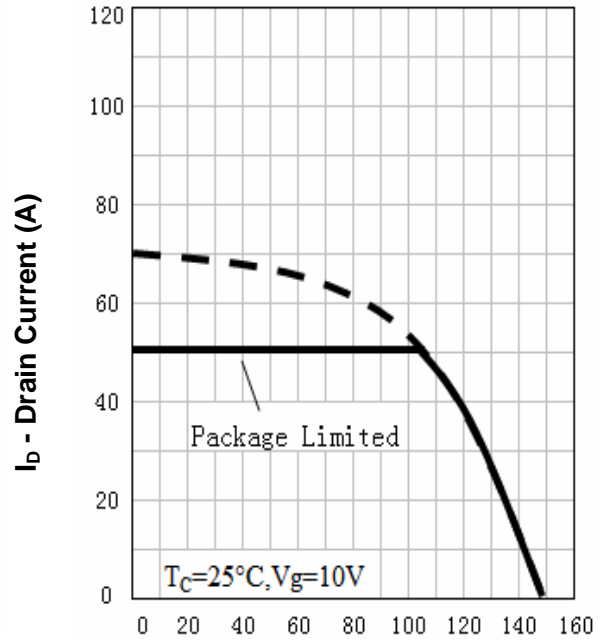
Typical Characteristics

Power Dissipation



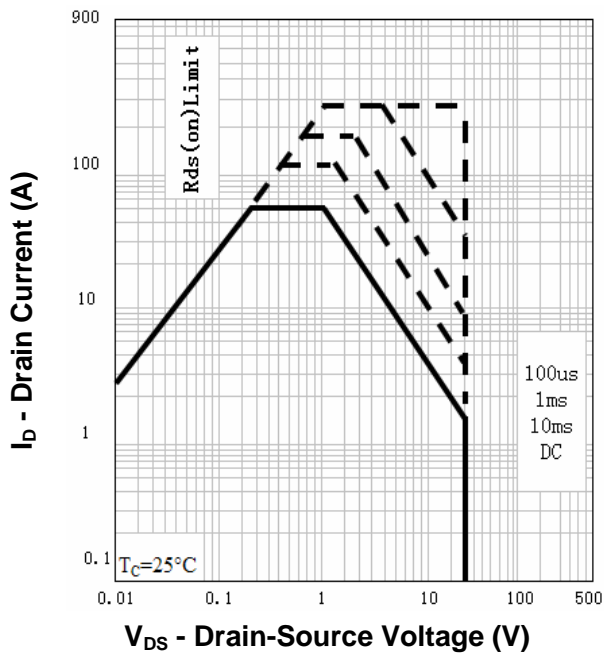
T_j - Junction Temperature (°C)

Drain Current

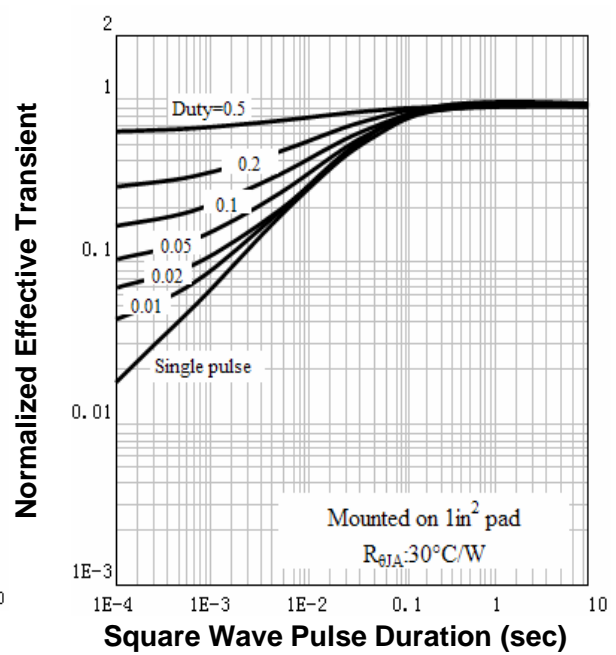


T_j - Junction Temperature (°C)

Safe Operation Area

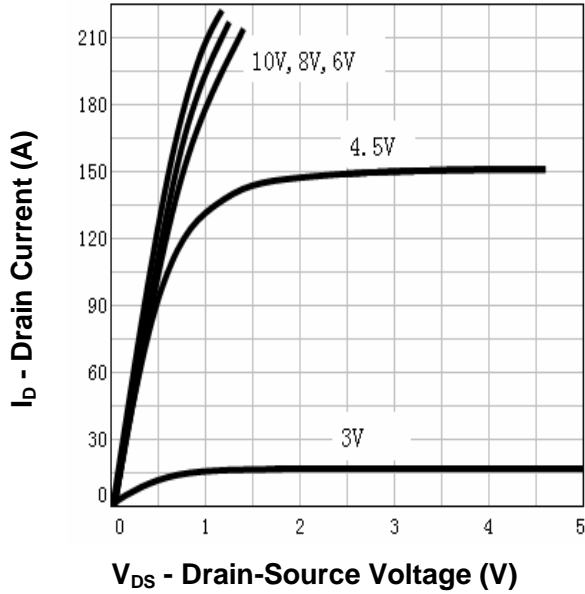


Thermal Transient Impedance

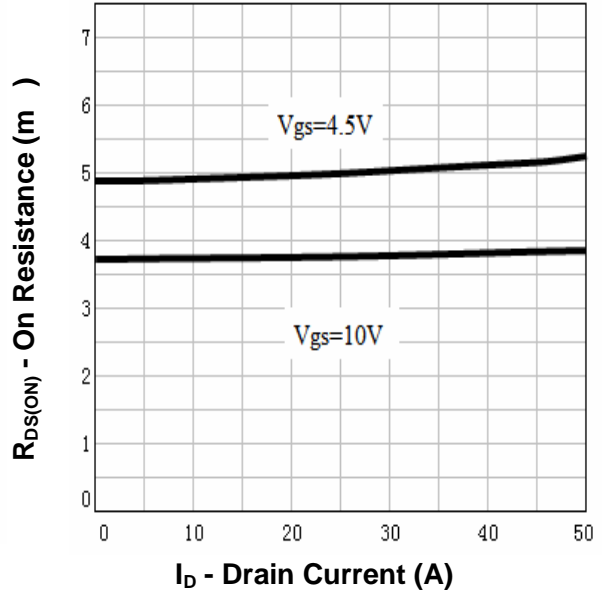


Typical Characteristics

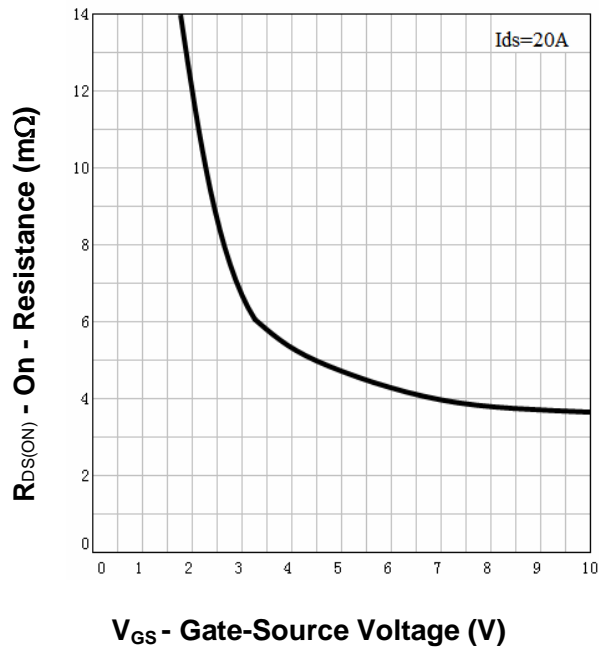
Output Characteristics



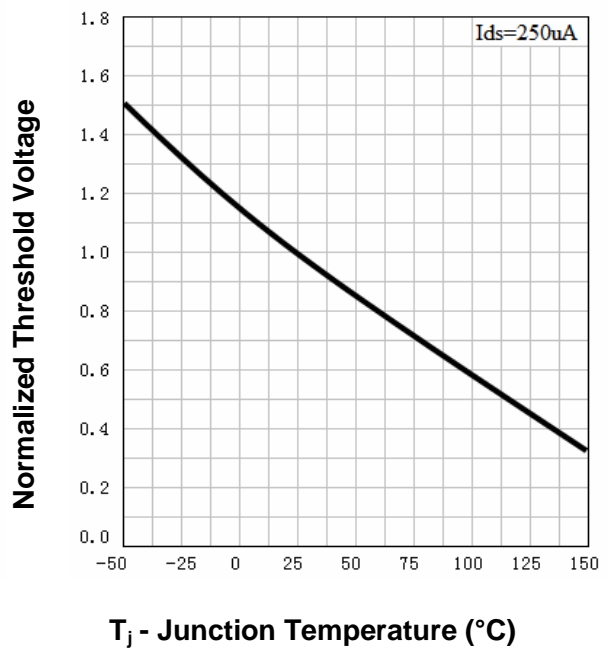
Drain-Source On Resistance



Drain-Source On Resistance

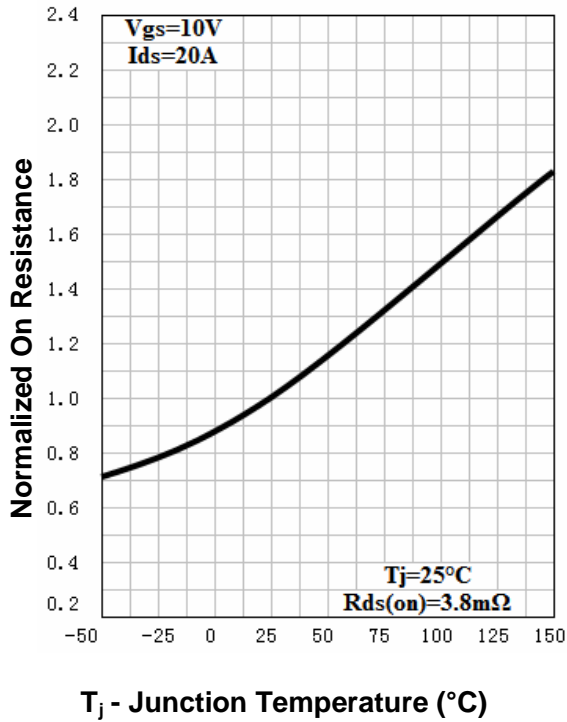


Gate Threshold Voltage

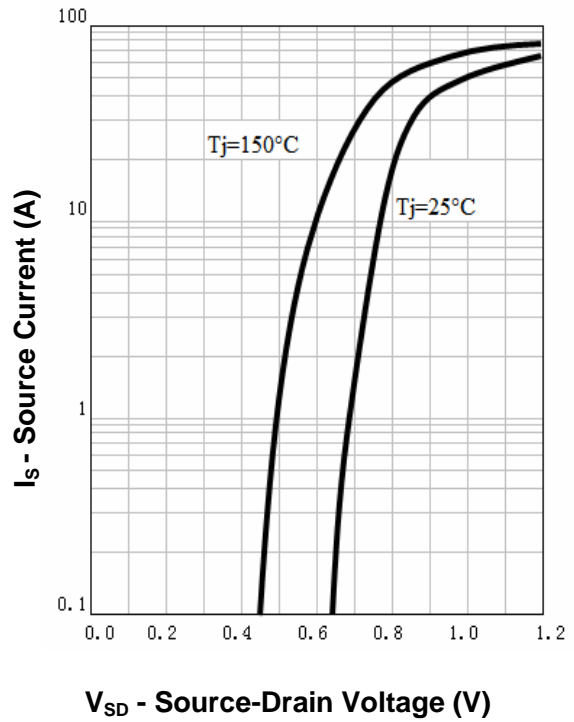


Typical Characteristics

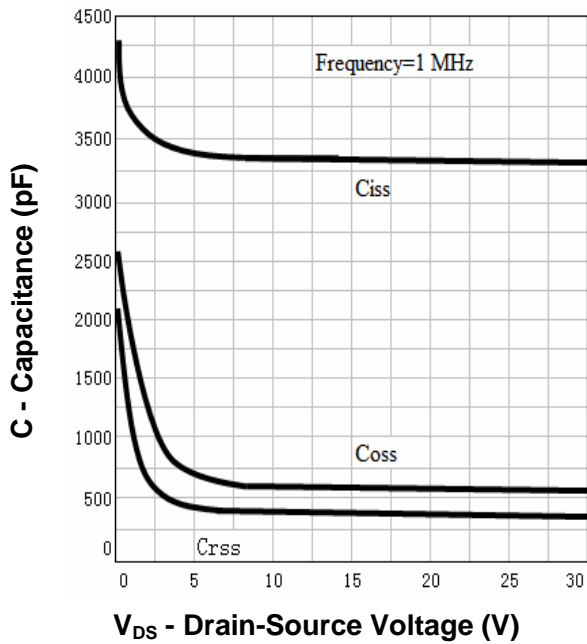
Drain-Source On Resistance



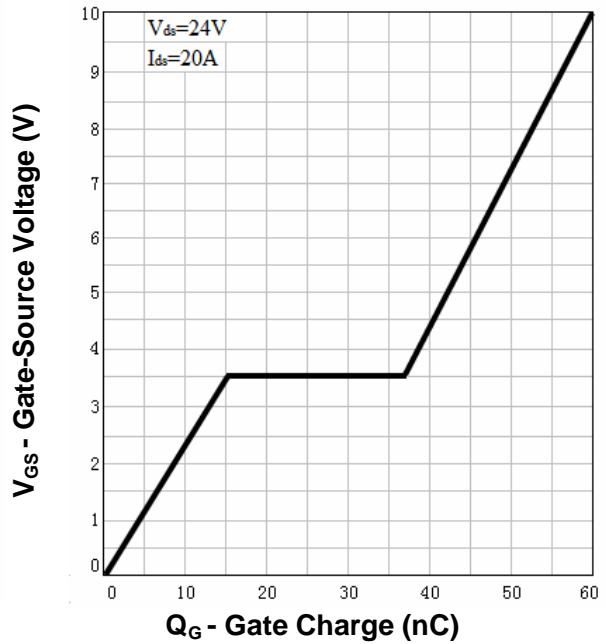
Source-Drain Diode Forward



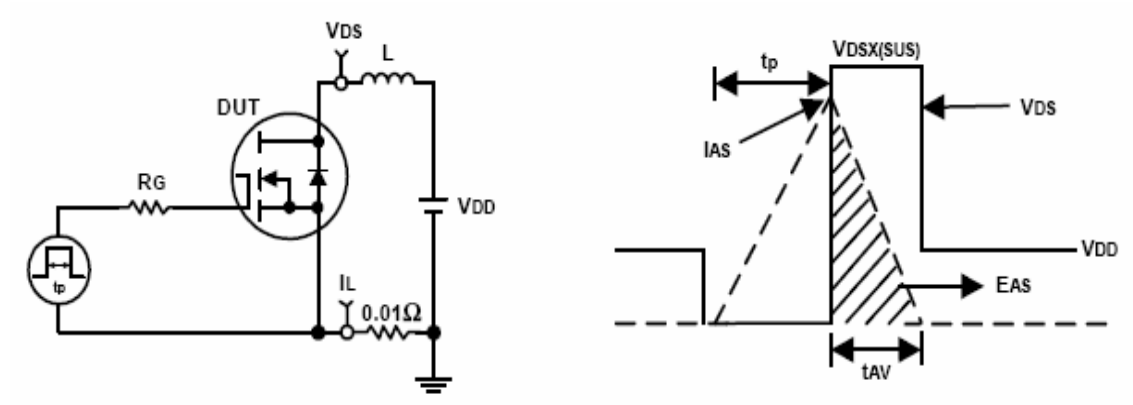
Capacitance



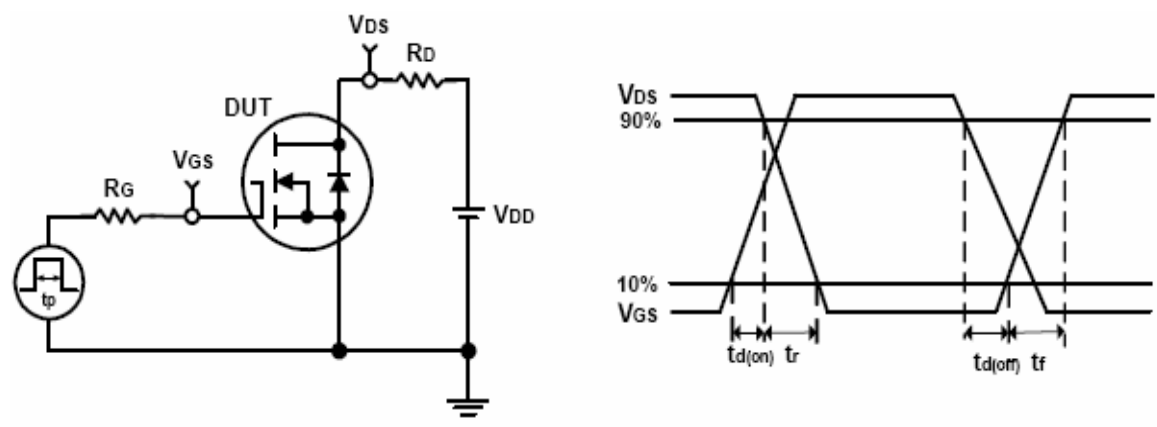
Gate Charge



Avalanche Test Circuit and Waveforms

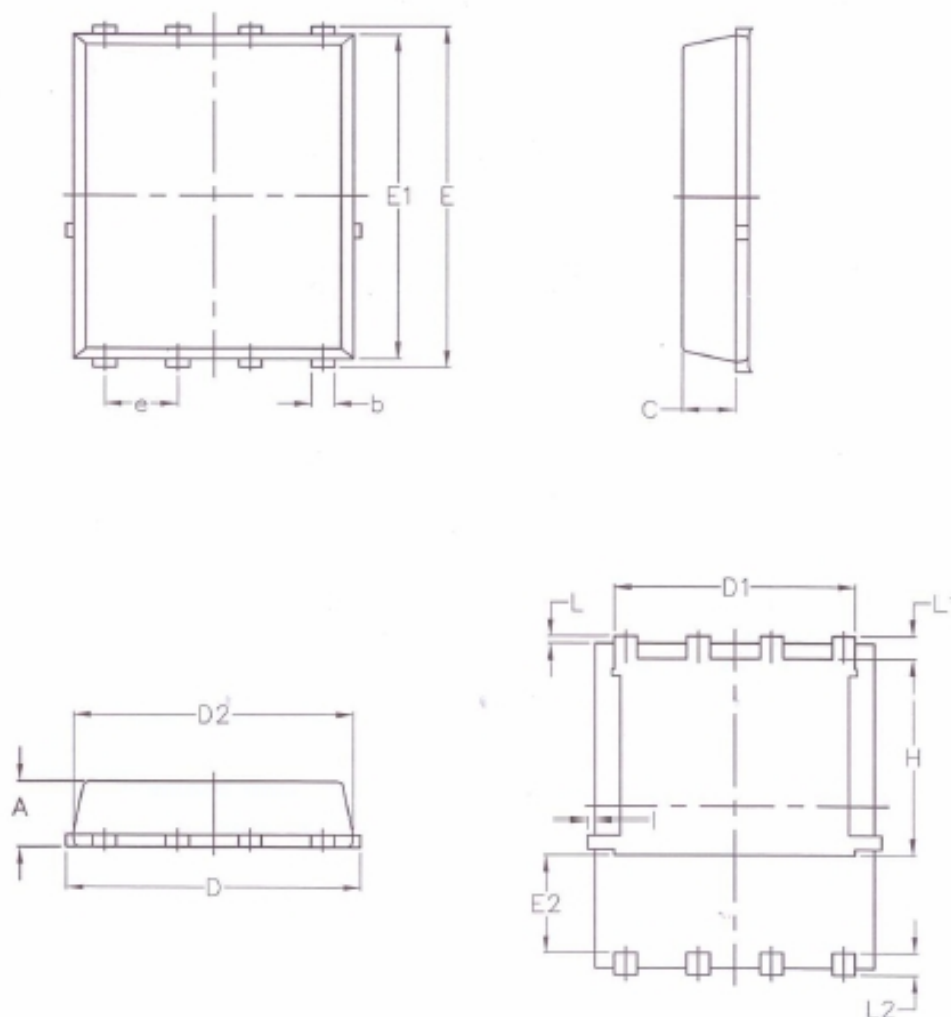


Switching Time Test Circuit and Waveforms



Package Information

PDFN 5X6



| SYMBOL | MM | | INCH | | SYMBOL | MM | | INCH | |
|--------|-------|-------|-------|-------|--------|-----------|-------|-----------|-------|
| | MIN | MAX | MIN | MAX | | MIN | MAX | MIN | MAX |
| A | 1.030 | 1.170 | 0.040 | 0.046 | E2 | 1.600 | - | 0.063 | - |
| b | 0.340 | 0.480 | 0.013 | 0.019 | e | 1.270 BSC | | 0.050 BSC | |
| C | 0.824 | 0.970 | 0.032 | 0.038 | L | 0.050 | 0.250 | 0.002 | 0.010 |
| D | 4.800 | 5.400 | 0.189 | 0.213 | L1 | 0.380 | 0.500 | 0.015 | 0.020 |
| D1 | 4.110 | 4.310 | 0.162 | 0.170 | L2 | 0.380 | 0.500 | 0.015 | 0.020 |
| D2 | 4.800 | 5.000 | 0.189 | 0.197 | H | 3.500 | 3.700 | 0.138 | 0.146 |
| E | 5.950 | 6.150 | 0.234 | 0.242 | I | - | 0.180 | - | 0.007 |
| E1 | 5.650 | 5.850 | 0.222 | 0.230 | | | | | |

ALL DIMENSIONS REFER TO JEDEC STANDARD
DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS

Customer Service

Worldwide Sales and Service:

Sales@ruichips.com

Technical Support:

Technical@ruichips.com

Investor Relations Contacts:

Investor@ruichips.com

Marcom Contact:

Marcom@ruichips.com

Editorial Contact:

Editorial@ruichips.com

HR Contact:

HR@ruichips.com

Legal Contact:

Legal@ruichips.com

Shen Zhen RUICHIPS Semiconductor CO., LTD

Room 501, the 5floor An Tong Industrial Building,
NO.207 Mei Hua Road Fu Tian Area Shen Zhen City, CHINA

TEL: (86-755) 8311-5334

FAX: (86-755) 8311-4278

E-mail: Sales-SZ@ruichips.com