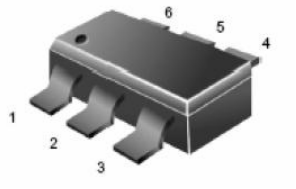
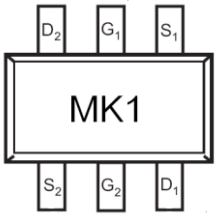
## Main Product Characteristics:

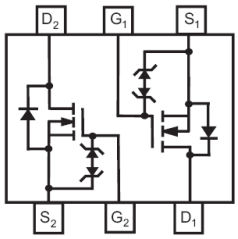
| | |
|---|---|
| $V_{DSS}$ | 20V |
| $R_{DS}$(on) | 0.4Ω (typ.) |
| $I_D$ | 0.54A |




SOT-363




Marking and Pin Assignment




Schematic Diagram

## Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150℃ operating temperature

## Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

## Absolute max Rating:

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Drain-Source Voltage | VDS | 20 | V |
| Gate-Source Voltage | VGS | ±8 | V |
| Drain Current-Continuous@ Current-Pulsed (Note 1) | $I_D$ | 0.54 | A |
| | $I_{DM}$ | 1.5 | A |
| Maximum Power Dissipation | $P_D$ | 0.2 | W |
| Operating Junction and Storage Temperature Range | $T_J$,$T_{STG}$ | -55 To 150 | ℃ |

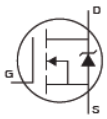
## Thermal Resistance

| | | | |
|---|---|---|---|
| Thermal Resistance,Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 625 | ℃/W |

## Electrical Characteristics @$T_A$=25℃ unless otherwise specified

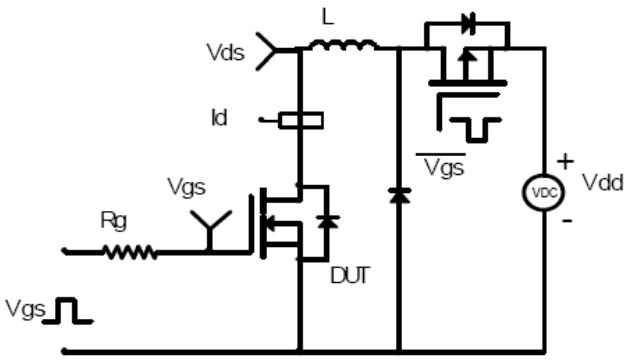
| Symbol | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|---|
| $V_{(BR)DSS}$ | Drain-to-Source breakdown voltage | 20 | — | — | V | $V_{GS}$ = 0V, $I_D$ = 250μA |
| $R_{DS(on)}$ | Static Drain-to-Source on-resistance | — | 0.4 | 0.55 | Ω | $V_{GS}$=4.5V,$I_D$ = 0.54A |
| | | — | 0.5 | 0.7 | Ω | $V_{GS}$=2.5V,$I_D$ = 0.5A |
| | | — | 0.7 | 0.9 | Ω | $V_{GS}$=1.8V,$I_D$ = 0.35A |
| $V_{GS(th)}$ | Gate threshold voltage | 0.5 | — | 1.0 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA |
| $I_{DSS}$ | Drain-to-Source leakage current | — | — | 1 | μA | $V_{DS}$ = 20V,$V_{GS}$ = 0V |
| $I_{GSS}$ | Gate-to-Source forward leakage | — | — | ±1 | μA | $V_{GS}$ = ±4.5V |
| | | — | — | ±10 | | $V_{GS}$ = ±8V |
| $C_{iss}$ | Input capacitance | — | 87 | — | pF | $V_{GS}$ = 0V |
| $C_{oss}$ | Output capacitance | — | 17 | — | | $V_{DS}$ = 16V |
| $C_{rss}$ | Reverse transfer capacitance | — | 10 | — | | $f$ = 1MHz |

## Source-Drain Ratings and Characteristics

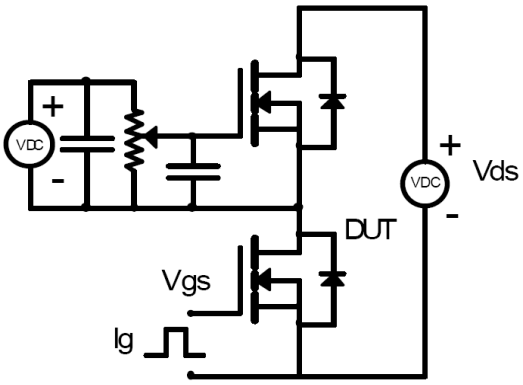
| Symbol | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current (Body Diode) | — | — | 0.54 | A | MOSFET symbol showing the integral reverse p-n junction diode.  |
| $I_{SM}$ | Pulsed Source Current (Body Diode) | — | — | 1.5 | A | |
| $V_{SD}$ | Diode Forward Voltage | — | — | 1.3 | V | $I_S$=0.12A, $V_{GS}$=0V |

## Test circuits and Waveforms

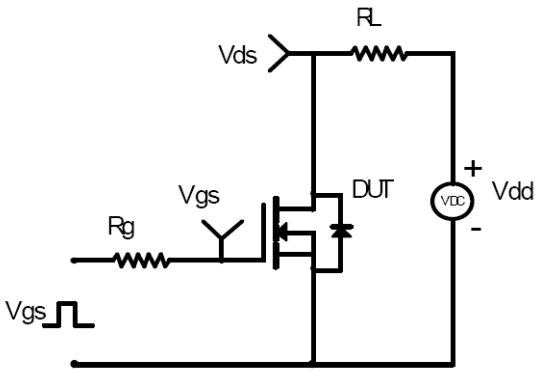
**EAS Test Circuit**



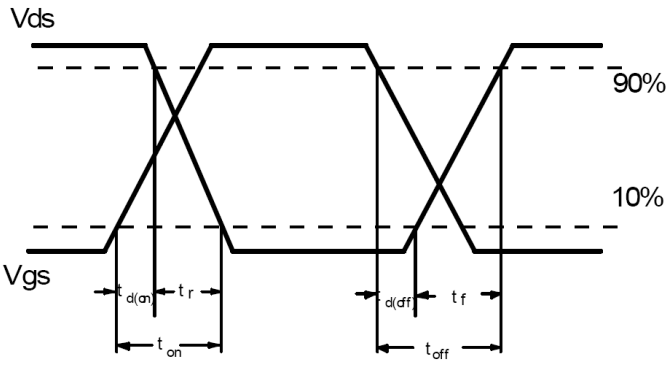

**Gate charge test circuit**




**Switching Time Test Circuit**




**Switching Waveforms**




## Notes:

①Calculated continuous current based on maximum allowable junction temperature.

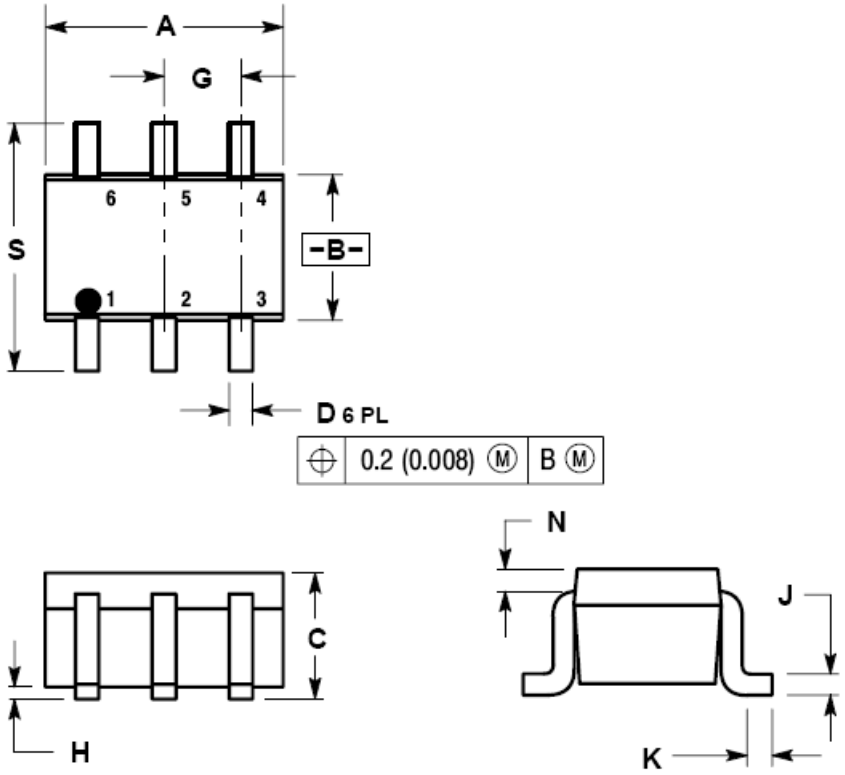
②Repetitive rating; pulse width limited by max. junction temperature.

③The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

④The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C

## Mechanical Data：

### SOT-363(SC-88) PACKAGE OUTLINE DIMENSION




NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419B−01 OBSOLETE, NEW STANDARD 419B−02.

| DIM | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 0.071 | 0.087 | 1.80 | 2.20 |
| B | 0.045 | 0.053 | 1.15 | 1.35 |
| C | 0.031 | 0.043 | 0.80 | 1.10 |
| D | 0.004 | 0.012 | 0.10 | 0.30 |
| G | 0.026 BSC | | 0.65 BSC | |
| H | --- | 0.004 | --- | 0.10 |
| J | 0.004 | 0.010 | 0.10 | 0.25 |
| K | 0.004 | 0.012 | 0.10 | 0.30 |
| N | 0.008 REF | | 0.20 REF | |
| S | 0.079 | 0.087 | 2.00 | 2.20 |

## Ordering and Marking Information

**Device Marking: MK1**

**Package (Available)**
**SOT-363(SC-88)**
**Operating Temperature Range**
**C : -55 to 150 °C**

## Devices per Unit

| Package Type | Units/ Tape | Tapes/Inner Box | Units/Inner Box | Inner Boxes/Carton Box | Units/ Carton Box |
|---|---|---|---|---|---|
| SOT-363 | 3000 | 10 | 30000 | 12 | 360000 |

## Reliability Test Program

| Test Item | Conditions | Duration | Sample Size |
|---|---|---|---|
| High Temperature Reverse Bias(HTRB) | $T_j$=125℃ to 150℃ @ 80% of Max $V_{DSS}$/$V_{CES}$/VR | 168 hours<br>500 hours<br>1000 hours | 3 lots x 77 devices |
| High Temperature Gate Bias(HTGB) | $T_j$=150℃@ 100% of Max $V_{GSS}$ | 168 hours<br>500 hours<br>1000 hours | 3 lots x 77 devices |

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