



YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

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企业微信二维码



企业QQ二维码

Product Summary

| BV _{DSS} | R _{DS(ON)} MAX | I _D MAX @T _A = +25°C |
|-------------------|---------------------------------|---|
| -20V | 0.75Ω @ V _{GS} = -4.5V | -0.63A |
| | 1.05Ω @ V _{GS} = -2.5V | -0.54A |

Description

This new generation MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}) yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Complementary Pair MOSFET
- Ultra-Small Surface Mount Package
- ESD Protected

Applications

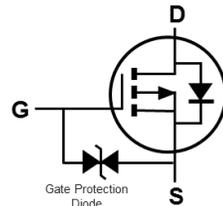
- Battery operated systems and solid-state relays
- Drivers: relays, solenoids, lamps, hammers, displays, memories, transistors, etc.
- Power supply converter circuits

Mechanical Data

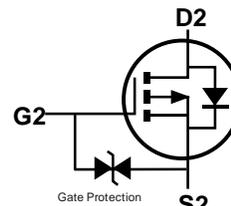
- Package: SOT363
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208^(e3)
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)


SOT363

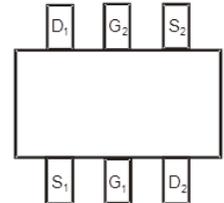

Top View



Q1 P-CHANNEL



Q2 P-CHANNEL


 Top View
 Pin-out

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Unit |
|--|--------------|--|-----------|---------------|------|
| Drain-Source Voltage | | | V_{DSS} | -20 | V |
| Gate-Source Voltage | | | V_{GSS} | ± 6 | V |
| Continuous Drain Current (Note 6) $V_{GS} = -4.5\text{V}$ | Steady State | $T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$ | I_D | -0.63 -0.5 | A |
| Maximum Continuous Body Diode Forward Current (Note 6) | | | I_S | -0.42 | A |
| Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%) | | | I_{DM} | -2.5 | A |

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | | Symbol | Value | Unit |
|--|---------------------------|-----------------|-------------|--------------------|
| Total Power Dissipation (Note 5) | $T_A = +25^\circ\text{C}$ | P_D | 0.37 | W |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady State | $R_{\theta JA}$ | 340 | $^\circ\text{C/W}$ |
| Total Power Dissipation (Note 6) | $T_A = +25^\circ\text{C}$ | P_D | 0.46 | W |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State | $R_{\theta JA}$ | 272 | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

Electrical Characteristics ($T_A = +25^\circ\text{C}$, $V_{BIAS} = 5\text{V}$, $V_{IN} = 1.05\text{V}$, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|--------------|------|------|-----------|---------------|---|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | -20 | — | — | V | $V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$ |
| Zero Gate Voltage Drain Current | I_{DSS} | — | — | -100 | nA | $V_{DS} = -20\text{V}, V_{GS} = 0\text{V}$ @ $T_C = +25^\circ\text{C}$ |
| Gate-Source Leakage | I_{GSS} | — | — | ± 2.0 | μA | $V_{GS} = \pm 4.5\text{V}, V_{DS} = 0\text{V}$ |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | -0.5 | — | -1.0 | V | $V_{DS} = V_{GS}, I_D = -250\mu\text{A}$ |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | — | 0.4 | 0.75 | Ω | $V_{GS} = -4.5\text{V}, I_D = -430\text{mA}$ |
| | | | 0.53 | 1.05 | | $V_{GS} = -2.5\text{V}, I_D = -300\text{mA}$ |
| | | | 0.7 | 1.5 | | $V_{GS} = -1.8\text{V}, I_D = -150\text{mA}$ |
| Diode Forward Voltage (Note 7) | V_{SD} | — | -0.7 | -1.2 | V | $V_{GS} = 0\text{V}, I_S = -150\text{mA}$ |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C_{iss} | — | 49 | — | pF | $V_{DS} = -16\text{V}, V_{GS} = 0\text{V},$ $f = 1.0\text{MHz}$ |
| Output Capacitance | C_{oss} | — | 12 | — | pF | |
| Reverse Transfer Capacitance | C_{rss} | — | 3.4 | — | pF | |
| Total Gate Charge | Q_g | — | 0.7 | — | nC | $V_{GS} = -4.5\text{V}, V_{DS} = -10\text{V},$ $I_D = -250\text{mA}$ |
| Gate-Source Charge | Q_{gs} | — | 0.1 | — | nC | |
| Gate-Drain Charge | Q_{gd} | — | 0.1 | — | nC | |
| Turn-On Delay Time | $t_{D(ON)}$ | — | 16 | — | ns | $V_{DS} = -10\text{V}, V_{GS} = -4.5\text{V},$ $R_g = 10\Omega, R_L = 47\Omega$ $I_D = -200\text{mA}$ |
| Turn-On Rise Time | t_R | — | 15 | — | ns | |
| Turn-Off Delay Time | $t_{D(OFF)}$ | — | 213 | — | ns | |
| Turn-Off Fall Time | t_F | — | 89 | — | ns | |

- Notes:
5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 7. Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to production testing.

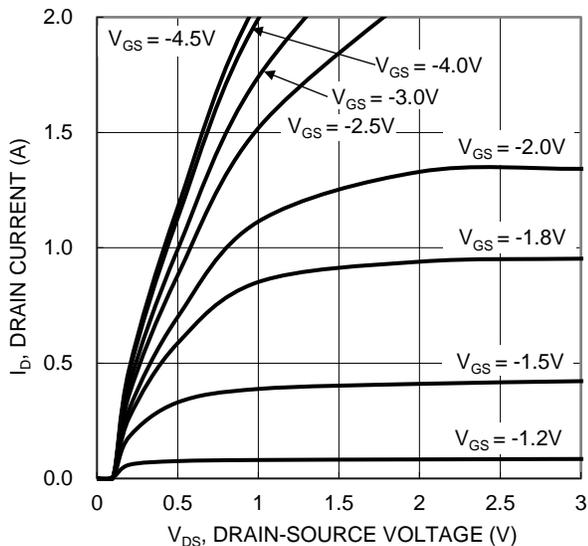


Figure 1. Typical Output Characteristic

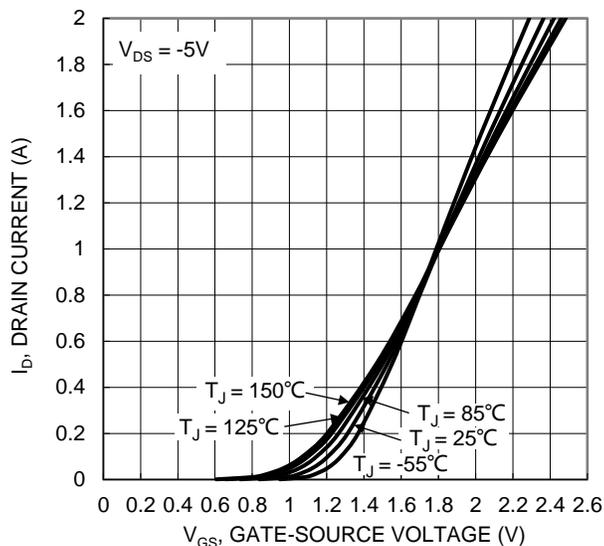


Figure 2. Typical Transfer Characteristic

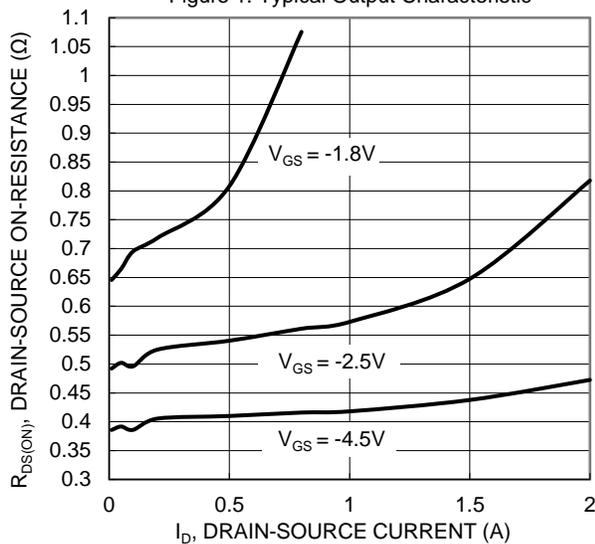


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

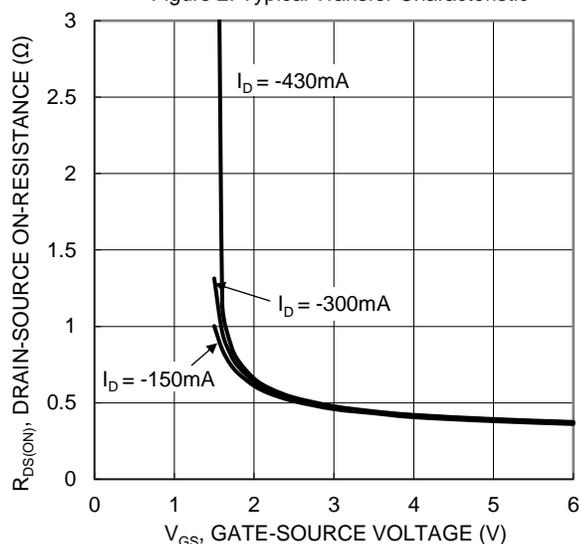


Figure 4. Typical Transfer Characteristic

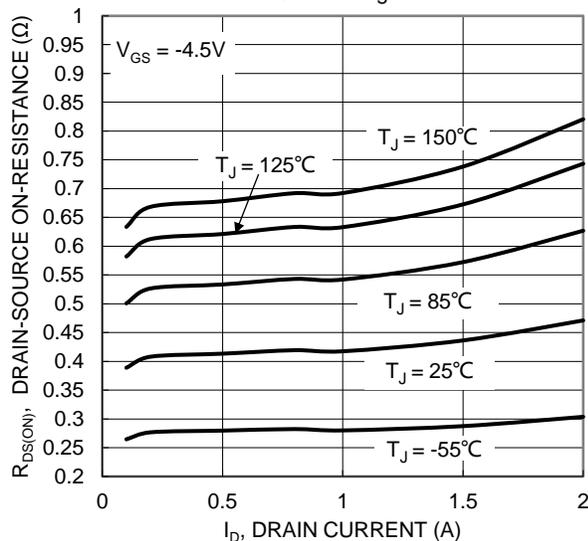


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

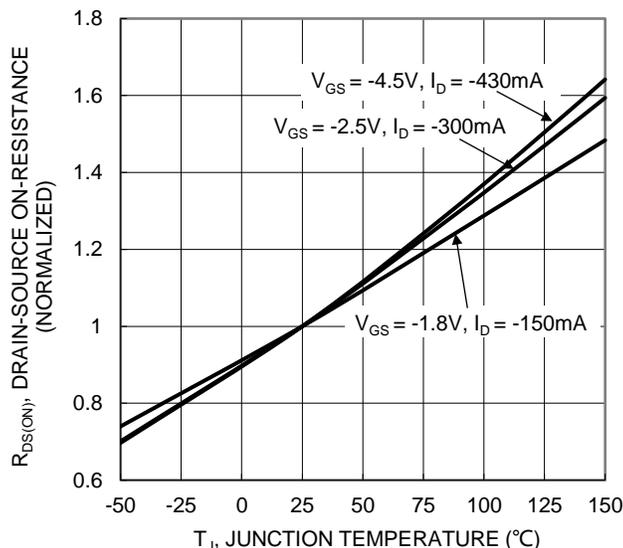


Figure 6. On-Resistance Variation with Junction Temperature

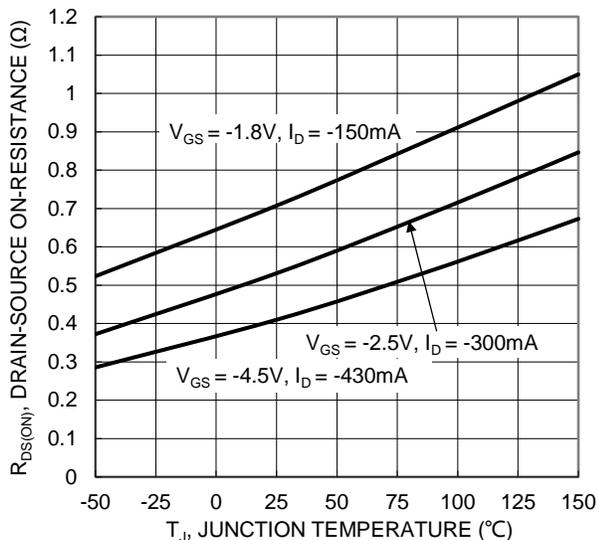


Figure 7. On-Resistance Variation with Junction Temperature

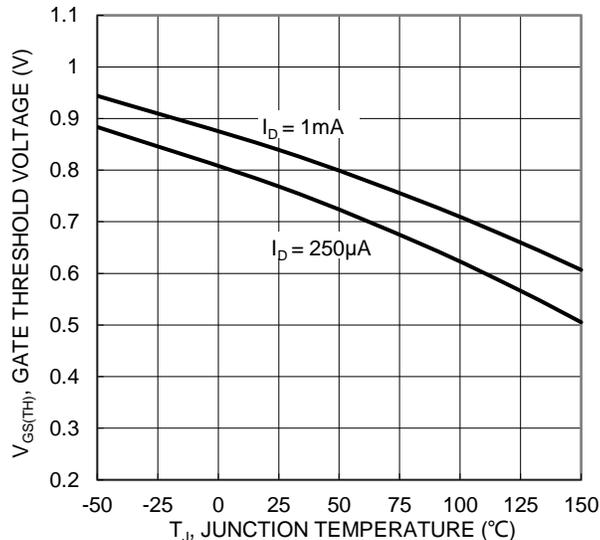


Figure 8. Gate Threshold Variation vs. Junction Temperature

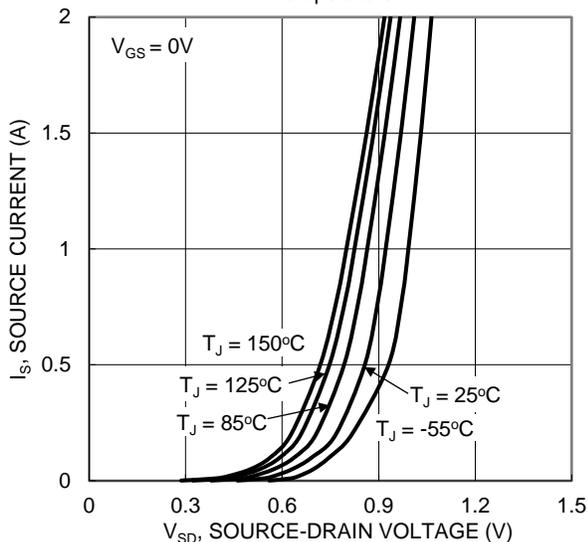


Figure 9. Diode Forward Voltage vs. Current

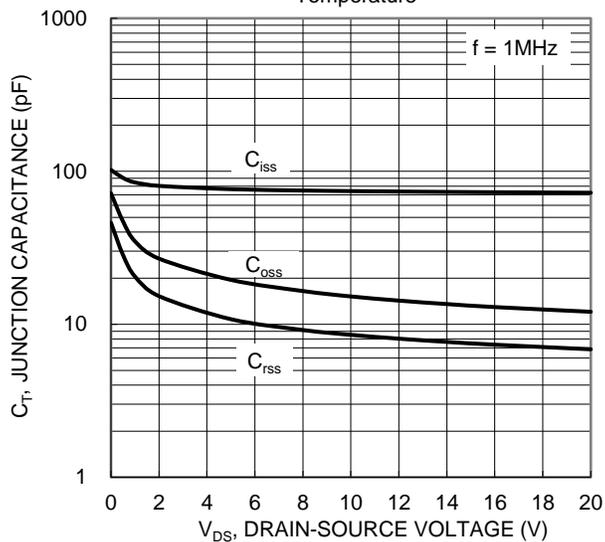


Figure 10. Typical Junction Capacitance

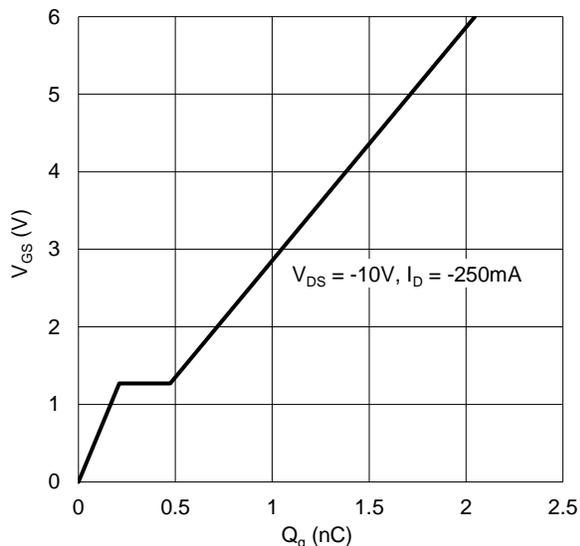


Figure 11. Gate Charge

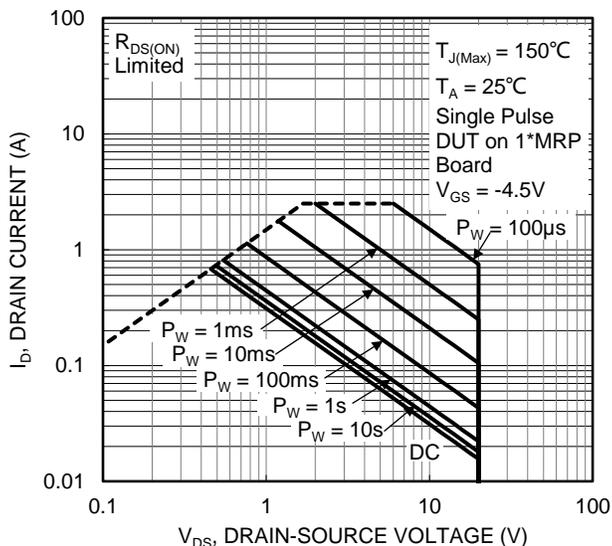


Figure 12. SOA, Safe Operation Area

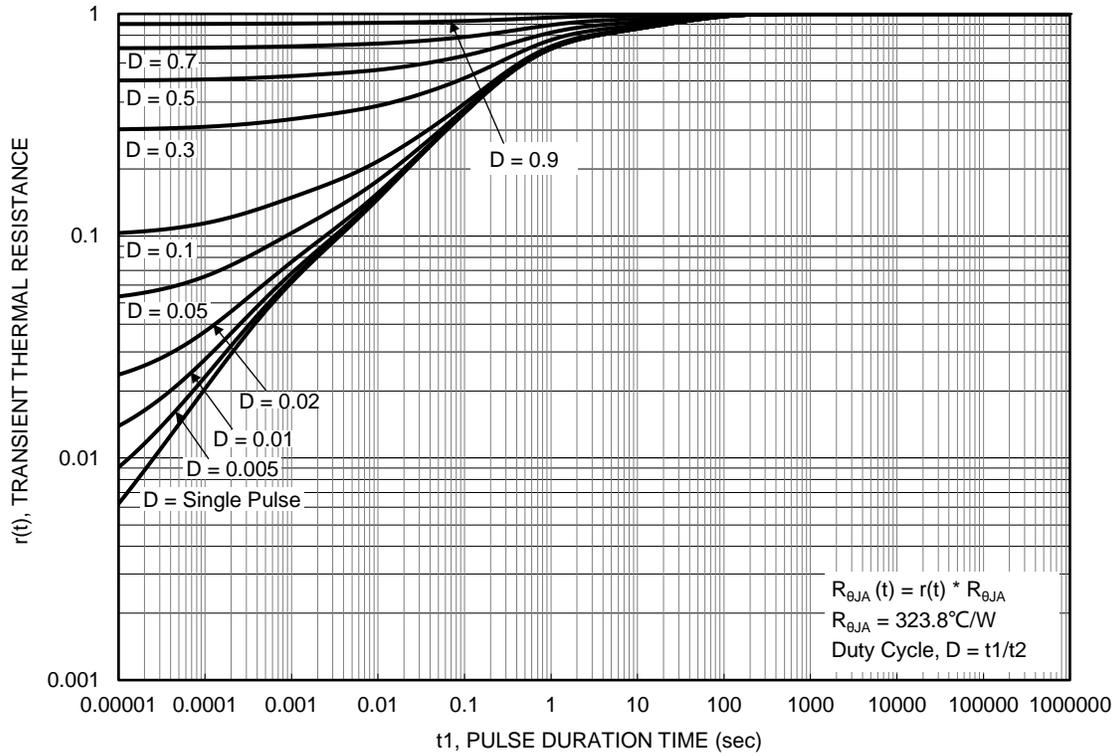
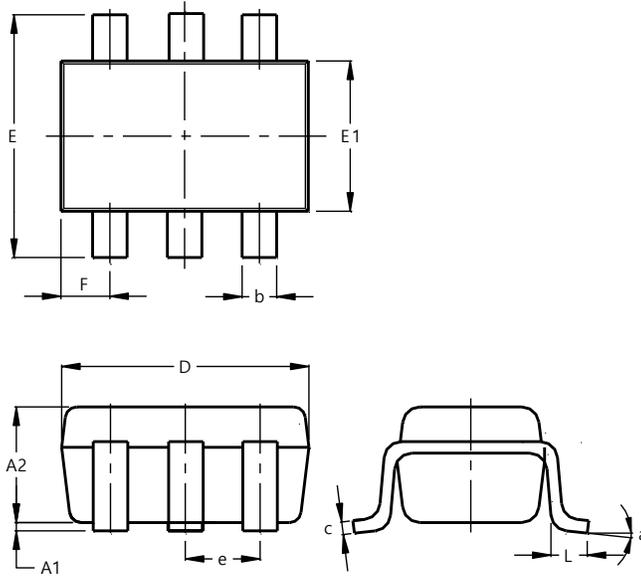


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

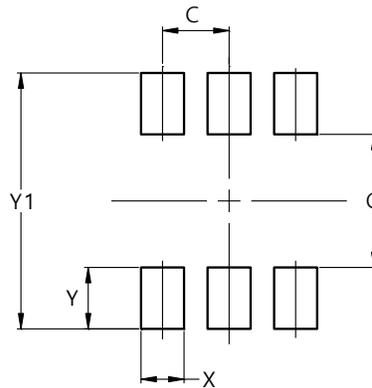
SOT363



| SOT363 | | | |
|-----------------------------|-----------|------|-------|
| Dim | Min | Max | Typ |
| A1 | 0.00 | 0.10 | 0.05 |
| A2 | 0.90 | 1.00 | 0.95 |
| b | 0.10 | 0.30 | 0.25 |
| c | 0.10 | 0.22 | 0.11 |
| D | 1.80 | 2.20 | 2.15 |
| E | 2.00 | 2.20 | 2.10 |
| E1 | 1.15 | 1.35 | 1.30 |
| e | 0.650 BSC | | |
| F | 0.40 | 0.45 | 0.425 |
| L | 0.25 | 0.40 | 0.30 |
| a | 0° | 8° | -- |
| All Dimensions in mm | | | |

Suggested Pad Layout

SOT363



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.650 |
| G | 1.300 |
| X | 0.420 |
| Y | 0.600 |
| Y1 | 2.500 |