



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



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Product Summary

Device	BV _{DSS}	R _{DS(ON)} Max	I _D T _A = +25°C
Q1	60V	13.5Ω @ V _{GS} = 10V	115mA
Q2	-50V	10Ω @ V _{GS} = -5V	-130mA

Description

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

Applications

- General Purpose Interfacing Switch
- Power Management Functions
- Analog Switch



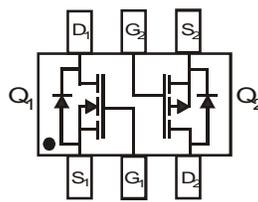
Top View

Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Complementary Pair

Mechanical Data

- Case: SOT363
- Case 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 
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)



Top View
Internal Schematic

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	200	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	625	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Maximum Ratings N-CHANNEL – Q1, NK-2N7002 Section (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	V
Drain-Gate Voltage $R_{GS} \leq 1.0\text{M}\Omega$	V_{DGR}	60	V
Gate-Source Voltage	V_{GSS}	± 20	V
		± 40	
Drain Current (Note 5)	I_D	Continuous	115
		Continuous @ $+100^\circ\text{C}$	73
		Pulsed	800

Maximum Ratings P-CHANNEL – Q2, NK-BSS84 Section (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	-50	V
Drain-Gate Voltage $R_{GS} \leq 20\text{K}\Omega$	V_{DGR}	-50	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current (Note 5)	I_D	-130	mA

Electrical Characteristics N-CHANNEL – Q1, NK-2N7002 Section (@T_A = +25°C, unless otherwise psecified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV _{DSS}	60	70	—	V	V _{GS} = 0V, I _D = 10μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1.0 500	μA	@ T _C = +25°C @ T _C = +125°C V _{DS} = 60V, V _{GS} = 0V
Gate-Body Leakage	I _{GSS}	—	—	±10	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V _{GS(TH)}	1.0	—	2.5	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	3.2 4.4	7.5 13.5	Ω	@ T _J = +25°C @ T _J = +125°C V _{GS} = 5.0V, I _D = 0.05A V _{GS} = 10V, I _D = 0.5A
On-State Drain Current	I _{D(ON)}	0.5	1.0	—	A	V _{GS} = 10V, V _{DS} = 7.5V
Forward Transconductance	g _{FS}	80	—	—	mS	V _{DS} = 10V, I _D = 0.2A
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iSS}	—	22	50	pF	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oSS}	—	11	25	pF	
Reverse Transfer Capacitance	C _{rSS}	—	2.0	5.0	pF	
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{D(ON)}	—	7.0	20	ns	V _{DD} = 30V, I _D = 0.2A, R _L = 150Ω, V _{GEN} = 10V, R _{GEN} = 25Ω
Turn-Off Delay Time	t _{D(OFF)}	—	11	20	ns	

Electrical Characteristics P-CHANNEL – Q2, NK-BSS84 Section (@T_A = +25°C, unless otherwise psecified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV _{DSS}	-50	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1 -2 -100	μA μA nA	V _{DS} = -50V, V _{GS} = 0V, T _J = +25°C V _{DS} = -50V, V _{GS} = 0V, T _J = +125°C V _{DS} = -25V, V _{GS} = 0V, T _J = +25°C
Gate-Body Leakage	I _{GSS}	—	—	±10	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V _{GS(TH)}	-0.8	—	-2.0	V	V _{DS} = V _{GS} , I _D = -1mA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	—	10	Ω	V _{GS} = -5V, I _D = -0.100A
Forward Transconductance	g _{FS}	0.05	—	—	S	V _{DS} = -25V, I _D = -0.1A
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iSS}	—	—	45	pF	V _{DS} = -25V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oSS}	—	—	25	pF	
Reverse Transfer Capacitance	C _{rSS}	—	—	12	pF	
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{D(ON)}	—	10	—	ns	V _{DD} = -30V, I _D = -0.27A, R _{GEN} = 50Ω, V _{GS} = -10V
Turn-Off Delay Time	t _{D(OFF)}	—	18	—	ns	

Note: 6. Short duration pulse test used to minimize self-heating effect.

N-CHANNEL – NK-2N7002 Section

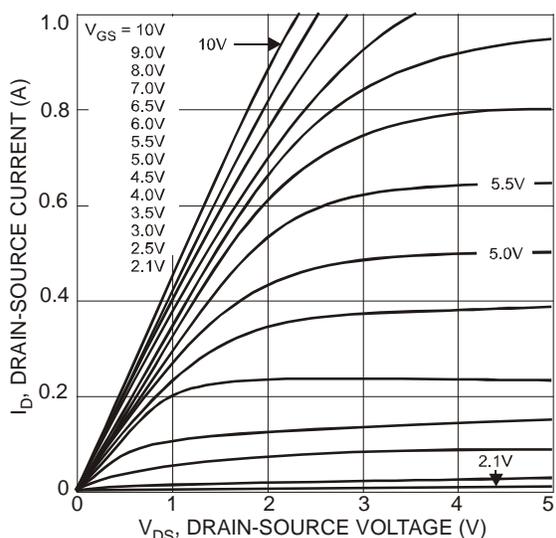


Figure 1 On-Region Characteristics

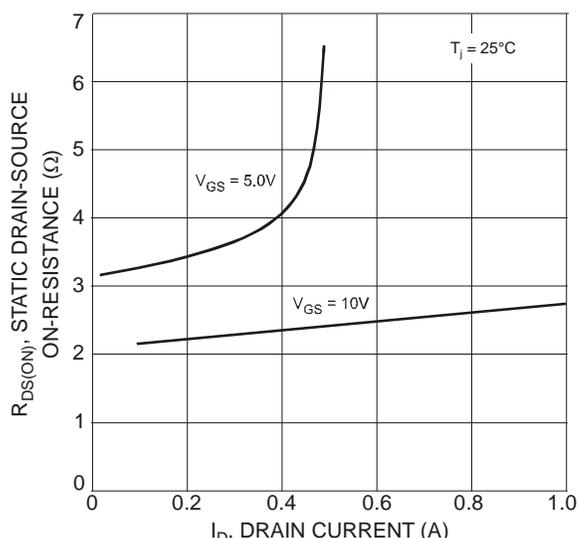


Figure 2 On-Resistance vs. Drain Current

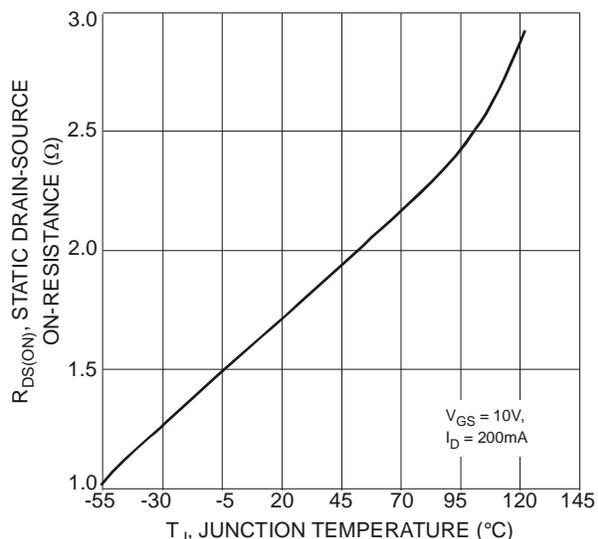


Figure 3 On-Resistance vs. Junction Temperature

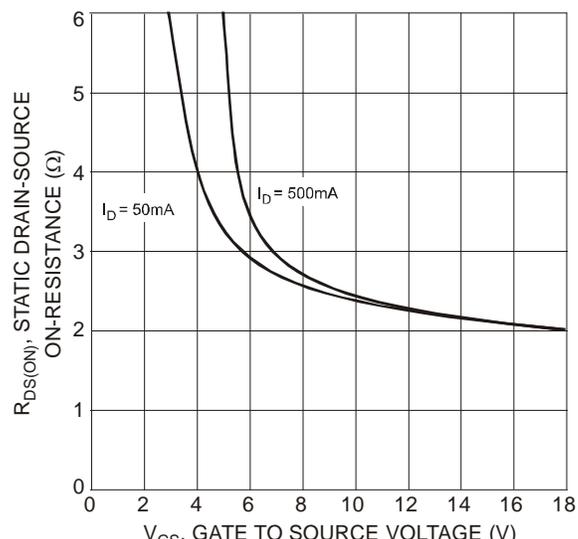


Figure 4 On-Resistance vs. Gate-Source Voltage

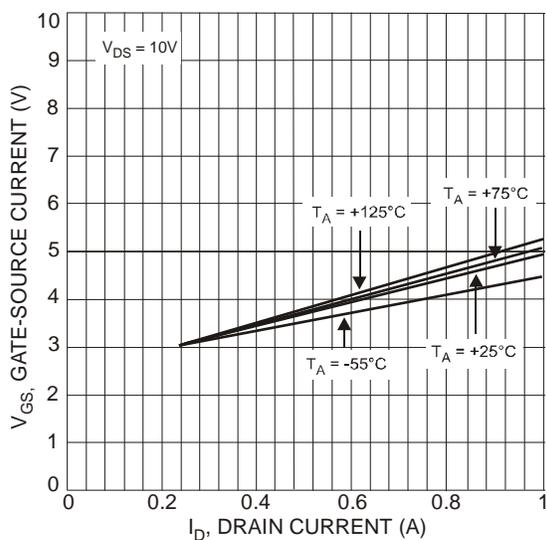


Figure 5 Typical Transfer Characteristics

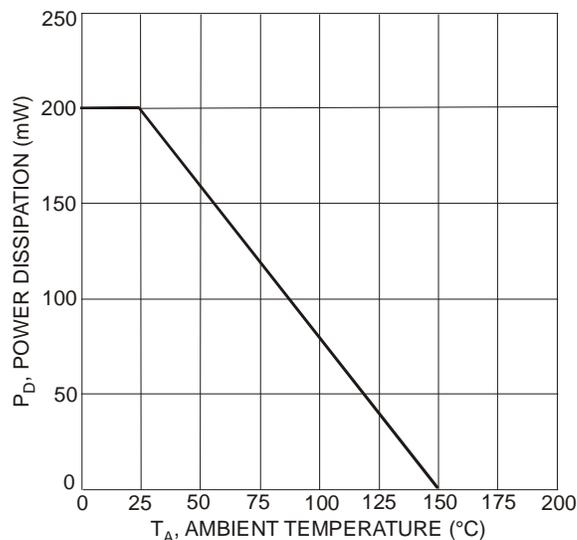


Figure 6 Max Power Dissipation vs. Ambient Temperature

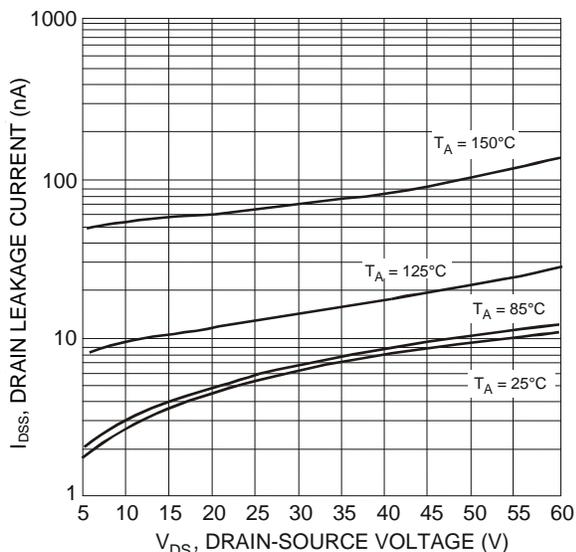


Figure 7 Typical Drain-Source Leakage Current vs. Voltage

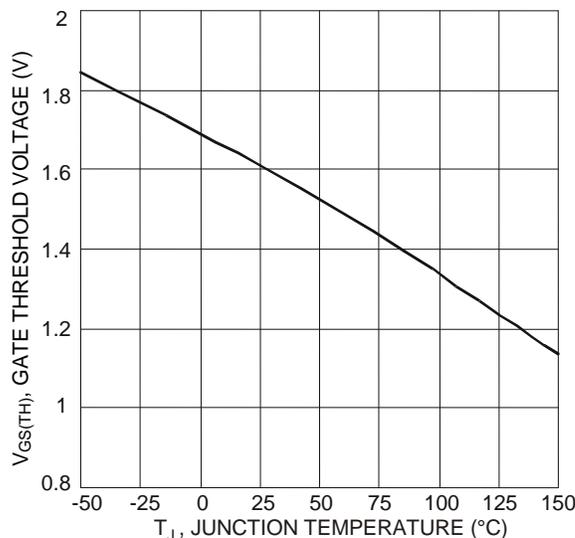


Figure 8 Gate Threshold Variation vs. Junction Temperature

P-CHANNEL – NK-BSS84 Section

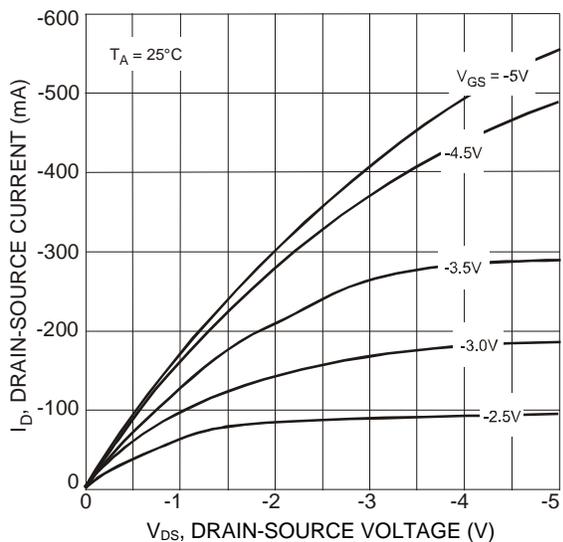


Figure 9 Drain-Source Current vs. Drain-Source Voltage

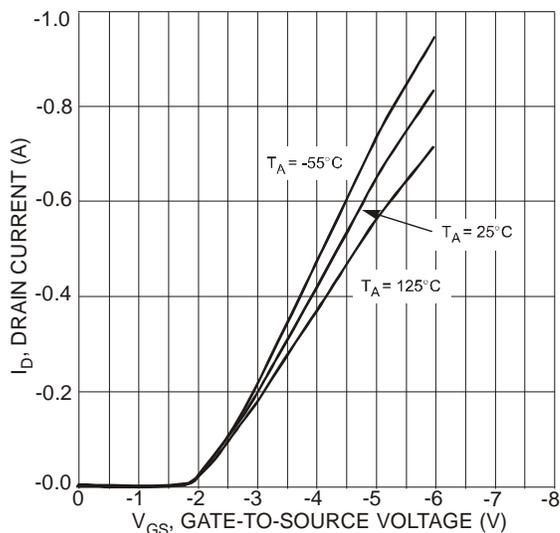


Figure 10 Drain Current vs. Gate-Source Voltage

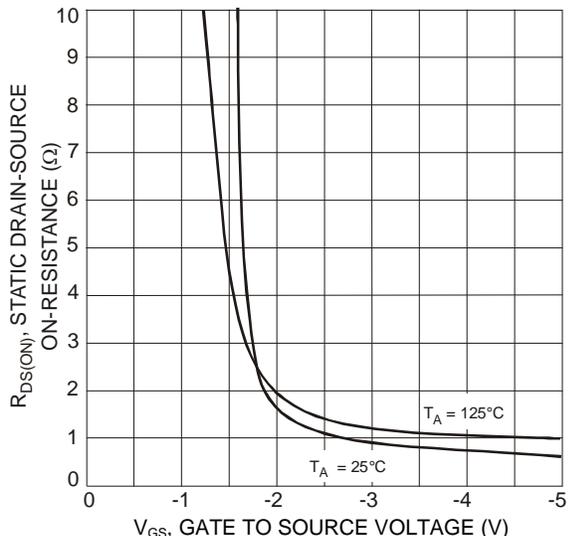


Figure 11 On-Resistance vs. Gate-Source Voltage

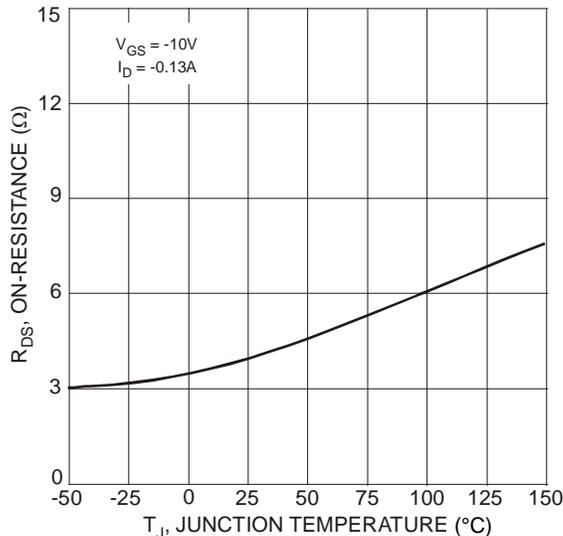


Figure 12 On-Resistance vs. Junction Temperature

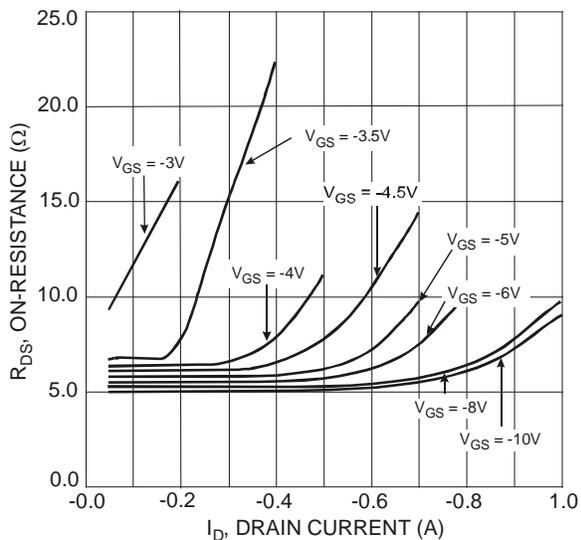


Figure 13 On-Resistance vs. Drain Current

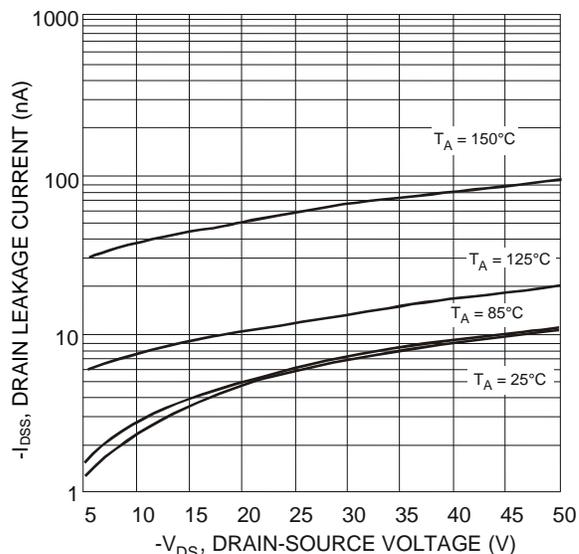


Figure 14 Typical Drain-Source Leakage Current vs. Voltage

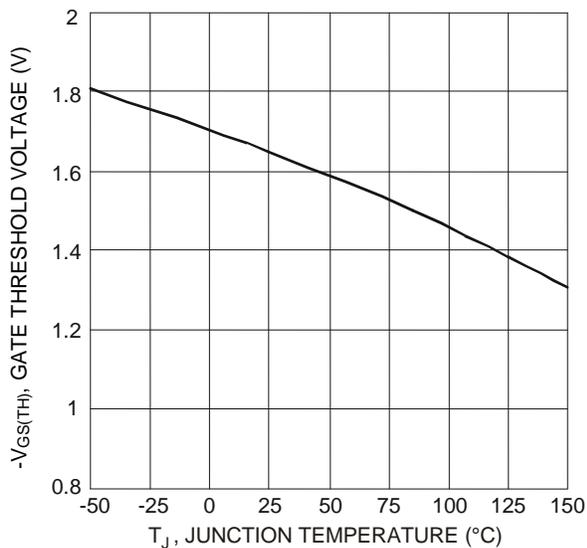
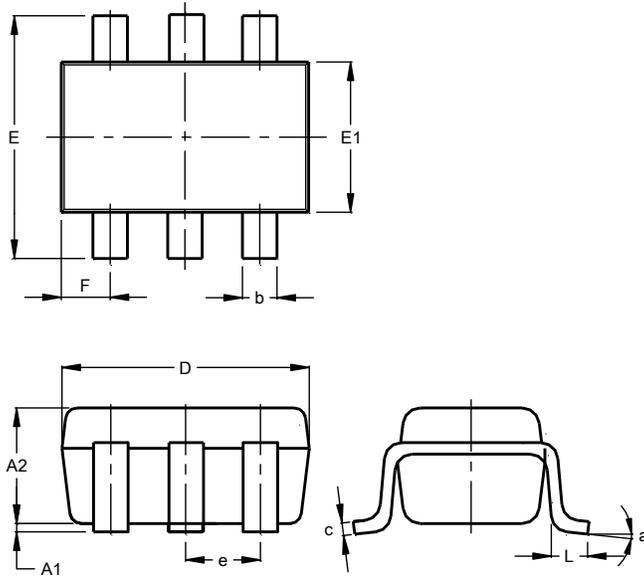


Figure 15 Gate Threshold Variation vs. Junction Temperature

Package Outline Dimensions

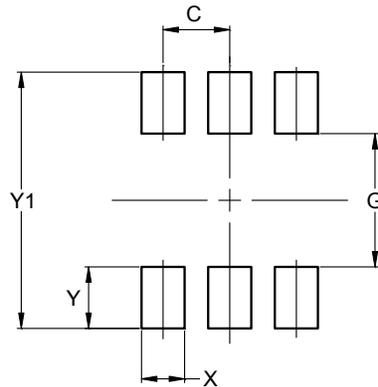
SOT363



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