优尚

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

BV_{DSS}	$R_{DS(ON)}$ (Ω)	I_D (A)
60V	0.08 @ V_{GS} = 10V	5.3
	0.15 @ V_{GS} = 4.5V	2.8

Features and Benefits

- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive

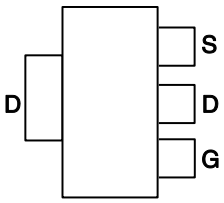
Description and Applications

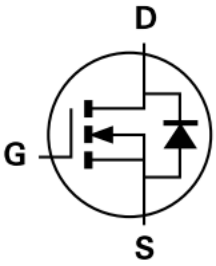
This MOSFET features a unique structure combining the benefits of low on-resistance and fast switching, making it ideal for high-efficiency power management applications.

- DC-DC converters
- Power management functions
- Disconnect switches
- Motor control

Mechanical Data

- Package: SOT223 (Type DN)
- Package Material: Molded Plastic.
  UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (Approximate)





Maximum Ratings

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current (V_{GS} = 10V)	T_A = +25°C (Note 6)	I_D	5.3	A
	T_A = +70°C (Note 6)		4.2	A
	T_A = +25°C (Note 5)		3.8	A
Pulsed Drain Current (Note 7)		I_{DM}	20	A
Maximum Continuous Body Diode Forward Current (Note 6)		I_S	2.1	A
Pulsed Body Diode Forward Current (Note 7)		I_{SM}	20	A

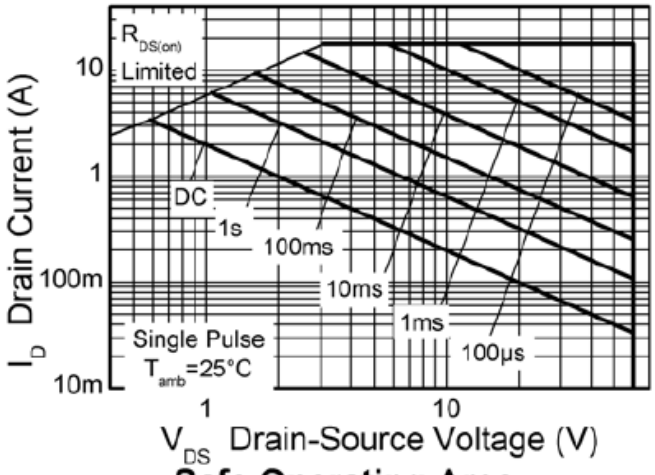
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Power Dissipation at T_A = +25°C (Note 5) Linear Derating Factor	P_D	2 16	W mW/°C
Junction to Ambient (Note 5)	$R_{\theta JA}$	62.5	°C/W
Power Dissipation at T_A = +25°C (Note 6) Linear Derating Factor	P_D	3.9 31	W mW/°C
Junction to Ambient (Note 6)	$R_{\theta JA}$	32	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

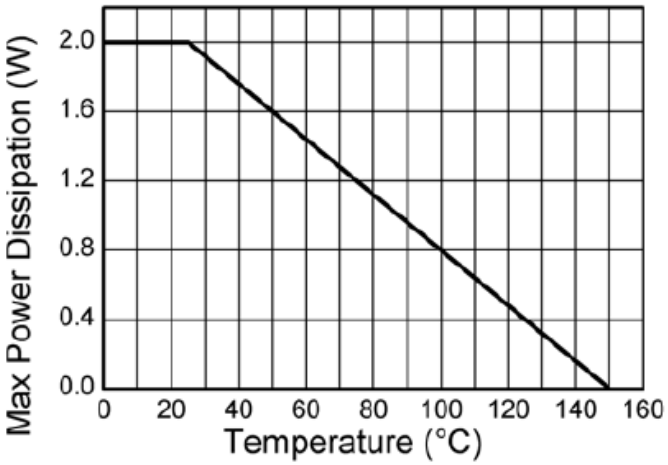
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	V_{GS} = 0V, I_D =250μA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	0.5	μA	V_{DS} = 60V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(th)}$	1	—	—	V	V_{DS} = V_{GS}, I_D = 250μA
Static Drain-Source On-State Resistance	$R_{DS(on)}$	—	0.06	0.08	Ω	V_{GS} = 10V, I_D = 4.8A
		—	0.08	0.15	Ω	V_{GS} = 4.5V, I_D = 4.2A
Forward Transconductance	g_{fs}	—	6.6	—	S	V_{DS} =15V, I_D = 4.8A
Diode Forward Voltage	V_{SD}	—	0.88	1.2	V	T_J = +25°C, I_S = 4A, V_{GS} = 0V
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	459	—	pF	V_{DS} = 40V, V_{GS} = 0V, f = 1MHz
Output Capacitance	C_{oss}	—	44.2	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	24.1	—	pF	
Total Gate Charge (V_{GS}= 5V)	Q_g	—	4.0	—	nC	V_{DS} = 30V, I_D = 1.4A
Total Gate Charge (V_{GS}= 10V)	Q_g	—	5.8	—	nC	
Gate-Source Charge	Q_{gs}	—	1.4	—	nC	
Gate Drain Charge	Q_{gd}	—	1.9	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	2.6	—	ns	V_{DD} = 30V, I_D = 1.5A R_G ≅ 6.0Ω, V_{GS} = 10V
Turn-On Rise Time	t_R	—	2.1	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	12.3	—	ns	
Turn-Off Fall Time	t_F	—	4.6	—	ns	
Reverse Recovery Time	t_{RR}	—	19.2	—	ns	T_J = +25°C, I_S = 1.4A, di/dt = 100A/μs
Reverse Recovery Charge	Q_{RR}	—	30.3	—	nC	

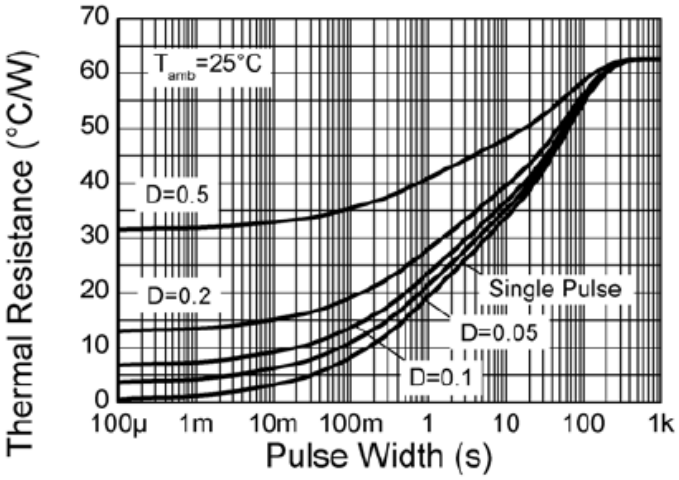
Notes:
5. For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
6. For a device surface mounted on FR4 PCB measured at t <= 10 sec.
7. Repetitive rating - 25mm x 25mm FR4 PCB, D=0.02, pulse width 300μs - pulse width limited by maximum junction temperature.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.



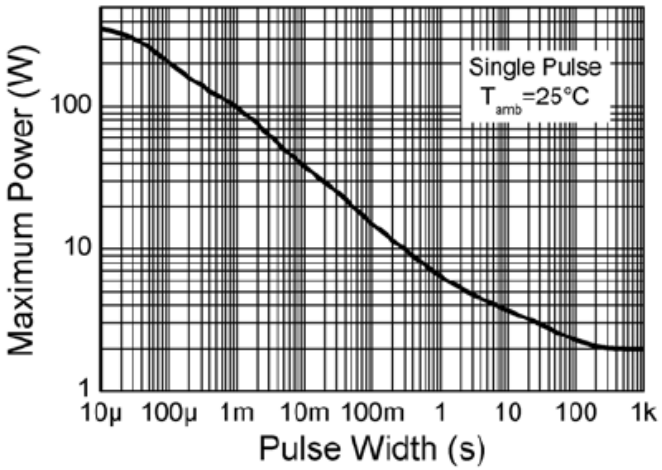
Safe Operating Area



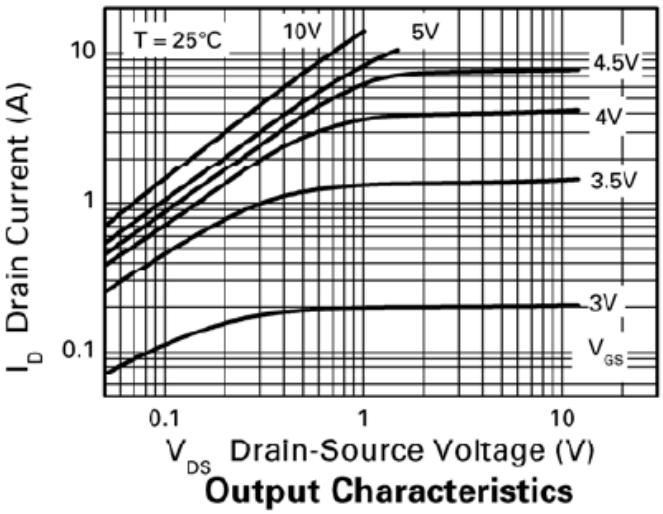
Derating Curve



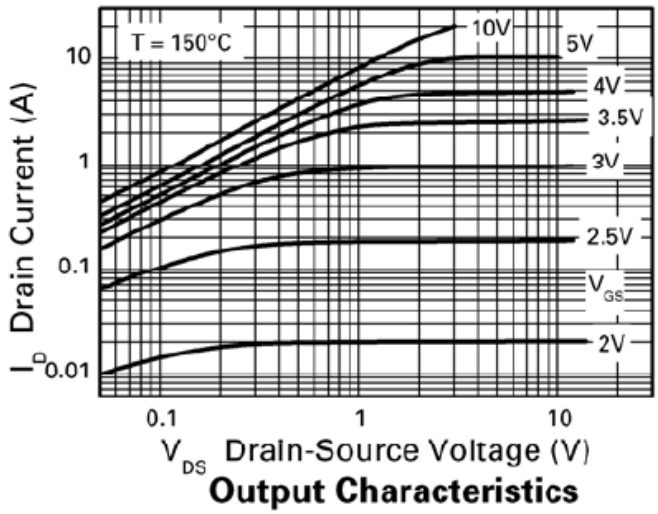
Transient Thermal Impedance



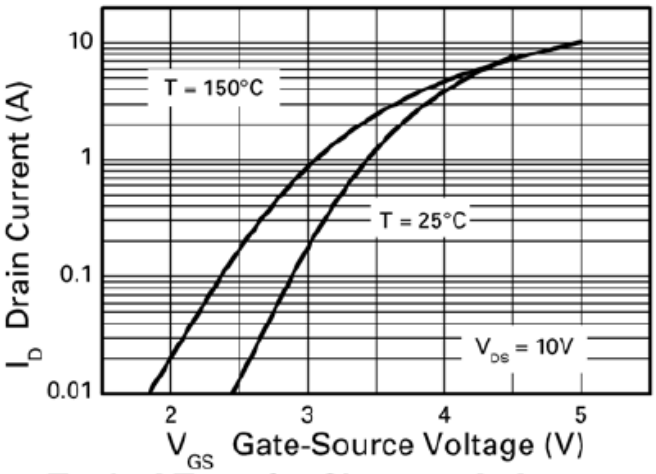
Pulse Power Dissipation



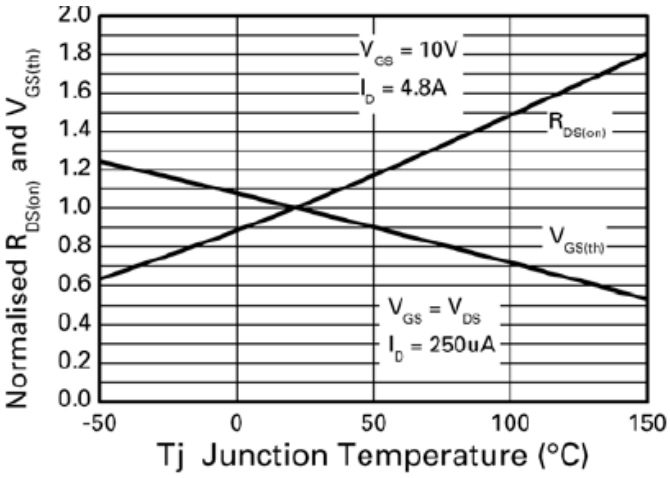
Output Characteristics



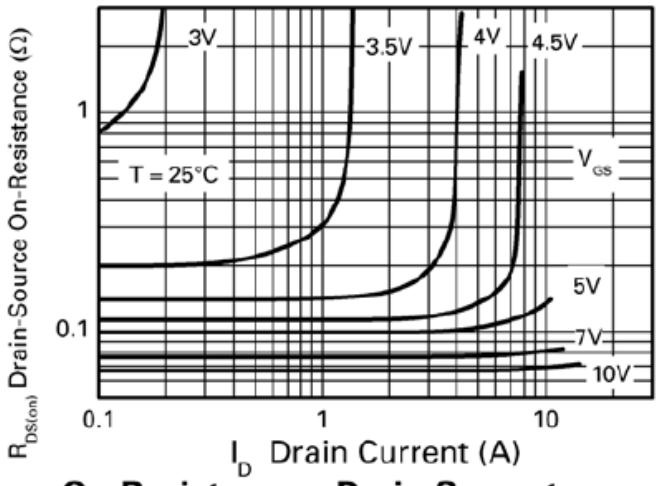
Output Characteristics



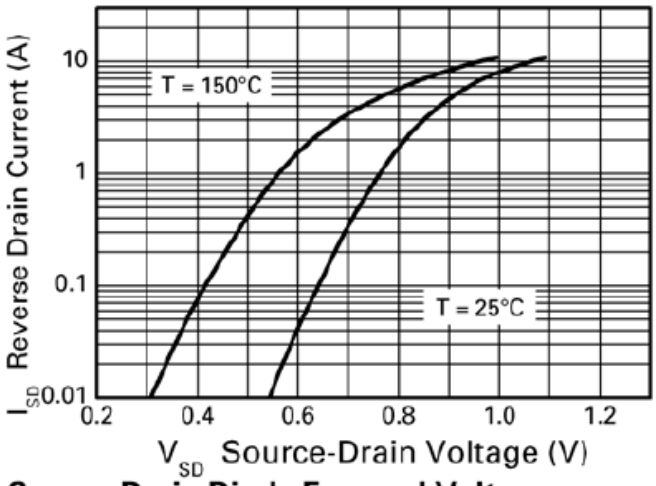
Typical Transfer Characteristics



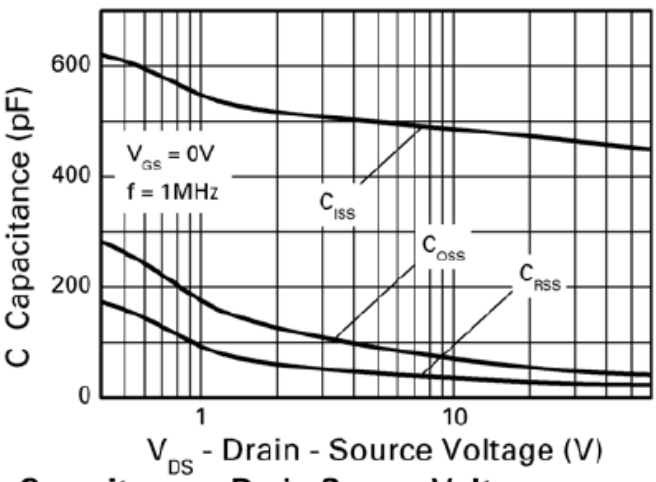
Normalised Curves v Temperature



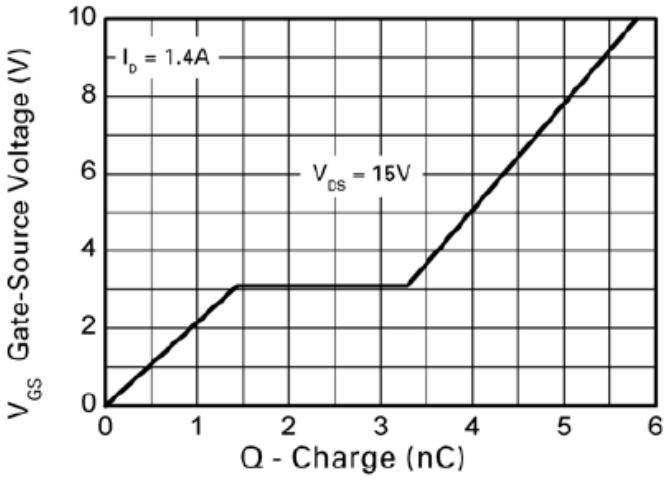
On-Resistance v Drain Current



Source-Drain Diode Forward Voltage

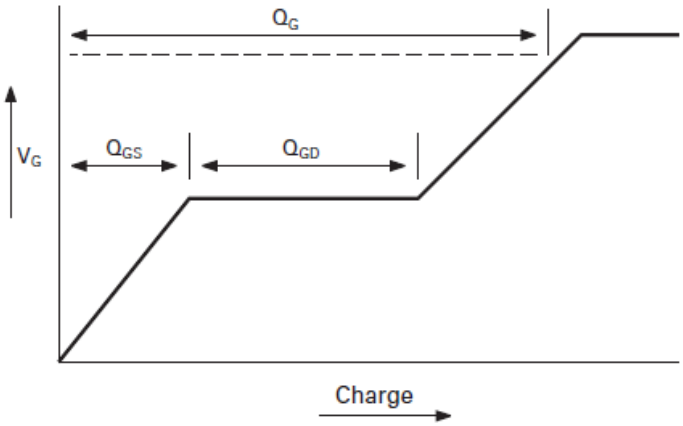


Capacitance v Drain-Source Voltage

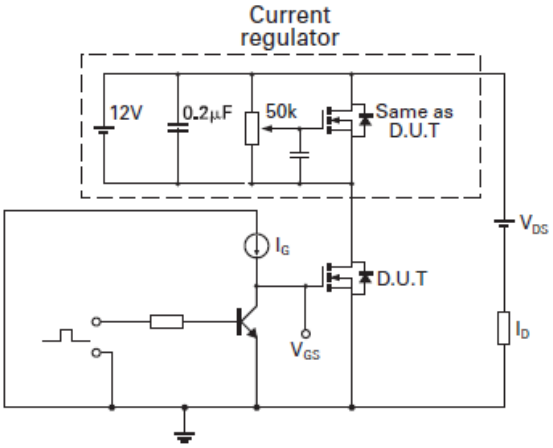


Gate-Source Voltage v Gate Charge

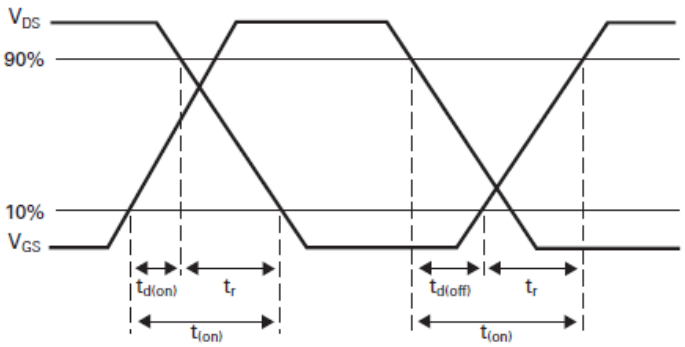
Test Circuits



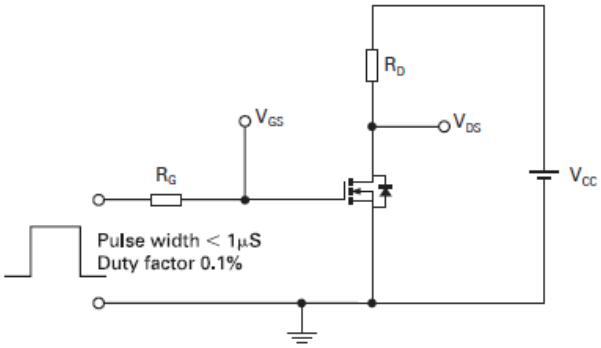
Basic gate charge waveform



Gate charge test circuit



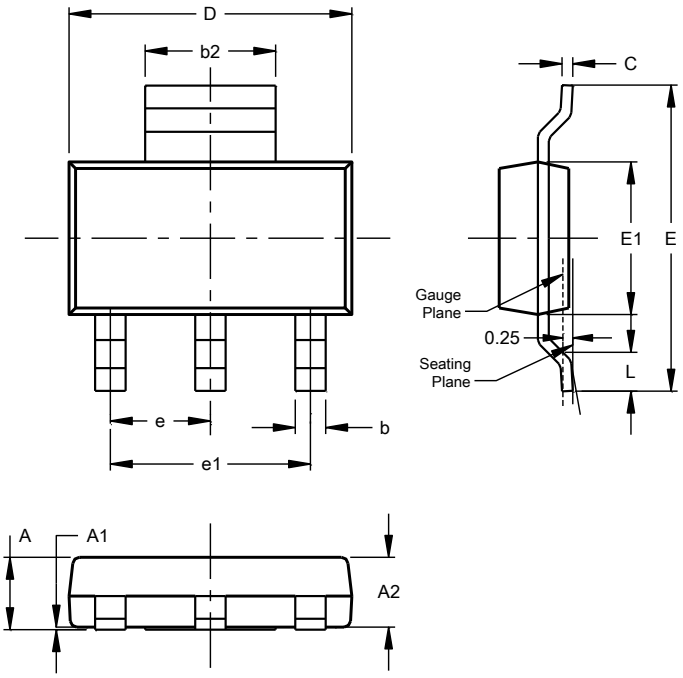
Switching time waveforms



Switching time test circuit

Package Outline Dimensions

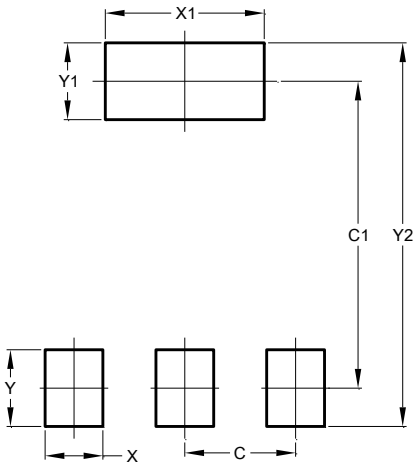
SOT223 (Type DN)



SOT223 (Type DN)			
Dim	**Min**	**Max**	**Typ**
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

Suggested Pad Layout

SOT223 (Type DN)



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00