

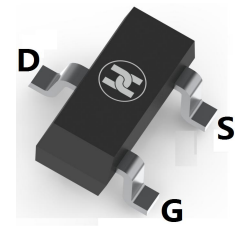
LOW VOLTAGE MOSFET (N-CHANNEL)

FEATURES

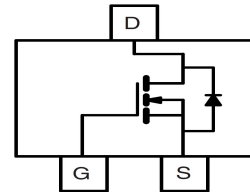
- Ultra low on-resistance: $V_{DS}=100V, R_{DS(ON)}=235m\Omega @ V_{GS}=10V, I_D=1.6A$
- For Low power DC to DC converter application
- For Load switch application
- Surface Mount device

MECHANICAL DATA

- Case: SOT-23
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 0.008 grams (approximate)



SOT-23

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 16	
Continuous Drain Current @ $V_{GS}=10V$	I_D	$T_A=25^\circ\text{C}$ 1.6	A
		$T_A=70^\circ\text{C}$ 1.3	
Pulsed Drain Current	I_{DM}	7	
Power Dissipation	P_D	$T_A=25^\circ\text{C}$ 1.3	W
		$T_A=70^\circ\text{C}$ 0.8	
Thermal Resistance.Junction- to-Ambient (Note.1)	R_{thJA}	100	$^\circ\text{C/W}$
		99	
Linear Derating Factor		0.01	$\text{W}/^\circ\text{C}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to 150	

Note.1: Surface mounted on 1 in square Cu board

Electric Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DS}	$I_D=250\mu\text{A}, V_{GS}=0V$	100			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$			20	μA
		$V_{DS}=100V, V_{GS}=0V, T_J=125^\circ\text{C}$			250	
Gate-Body Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 16V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1		2.5	V
Static Drain-Source On-Resistance (Note.1)	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=1.3A$		190	235	$m\Omega$
		$V_{GS}=10V, I_D=1.6A$		178	220	
Forward Transconductance	g_{FS}	$V_{DS}=50V, I_D=1.6A$	5.7			S
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=25V, f=1\text{MHz}$		290		pF
Output Capacitance	C_{oss}			27		
Reverse Transfer Capacitance	C_{rss}			13		
Gate Resistance	R_g			1.3		Ω
Total Gate Charge	Q_g	$V_{GS}=4.5V, V_{DS}=50V, I_D=1.6A$		2.5		nC
Gate Source Charge	Q_{gs}			0.5		
Gate Drain Charge	Q_{gd}			1.2		
Turn-On DelayTime	$t_{d(on)}$	$V_{GS}=4.5V, V_{DS}=50V, I_D=1A, R_{GEN}=6.8\Omega$		2.2		ns
Turn-On Rise Time	t_r			2.1		
Turn-Off DelayTime	$t_{d(off)}$			9		
Turn-Off Fall Time	t_f			3.6		
Body Diode Reverse Recovery Time	t_{rr}	$V_R=50V, I_F=1.1A, di/dt=100A/\mu\text{s}, T_J=25^\circ\text{C}$ (Note.1)		20	30	nC
Body Diode Reverse Recovery Charge	Q_{rr}			13	20	
Maximum Body-Diode Continuous Current	I_S				1.1	A
Pulsed Source Current	I_{SM}	(Note.2)			7	
Diode Forward Voltage	V_{SD}	$I_S=1.1A, V_{GS}=0V, T_J=25^\circ\text{C}$ (Note.1)			1.3	V

Note.1: Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.

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

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Typical Characteristics

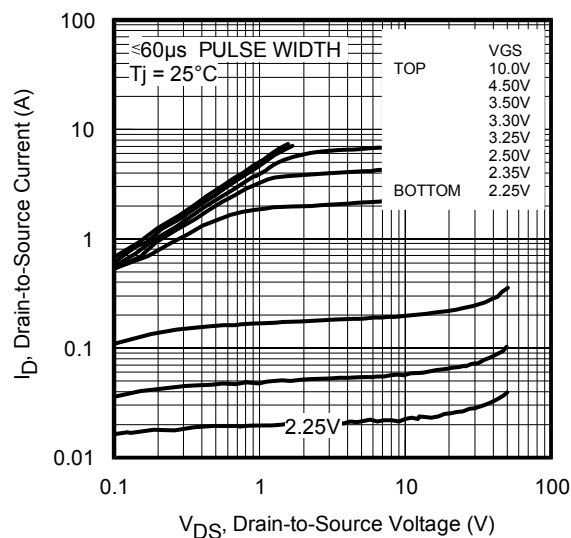


Fig 1. Typical Output Characteristics

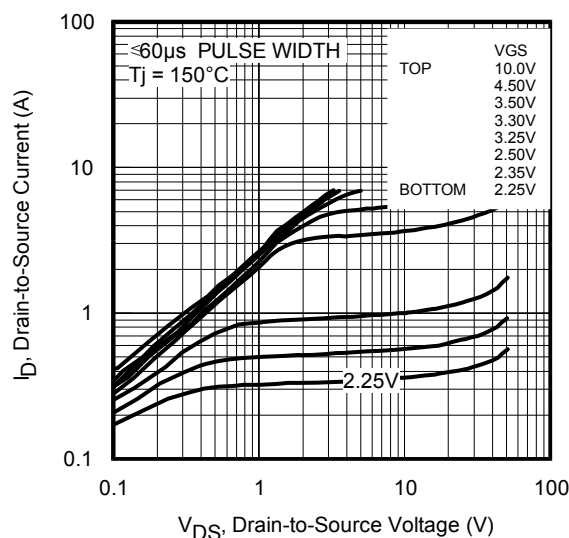


Fig 2. Typical Output Characteristics

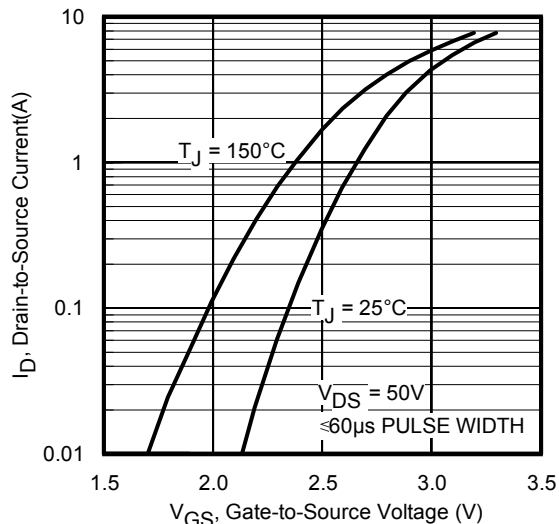


Fig 3. Typical Transfer Characteristics

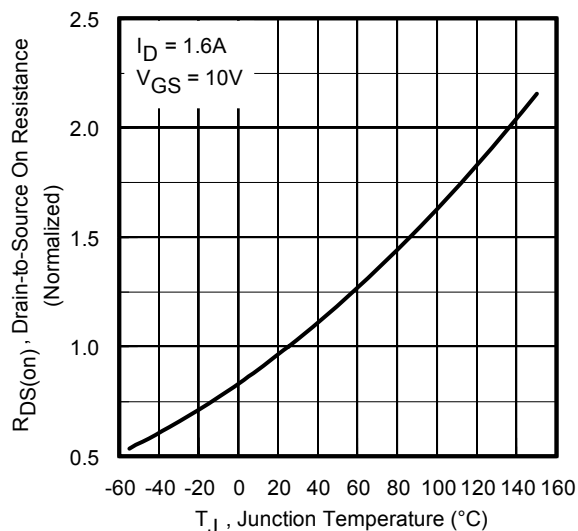


Fig 4. Normalized On-Resistance Vs. Temperature

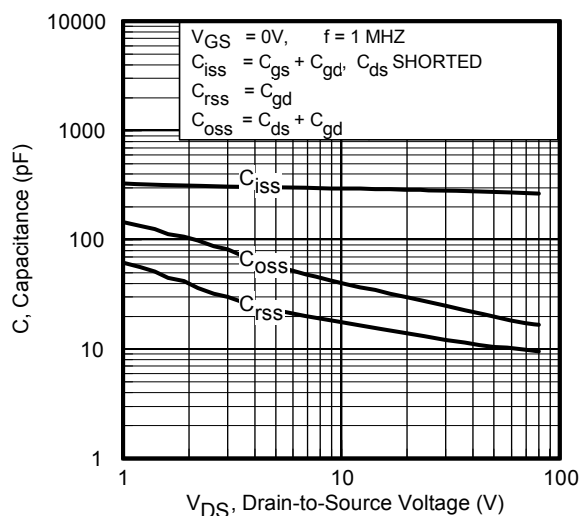


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

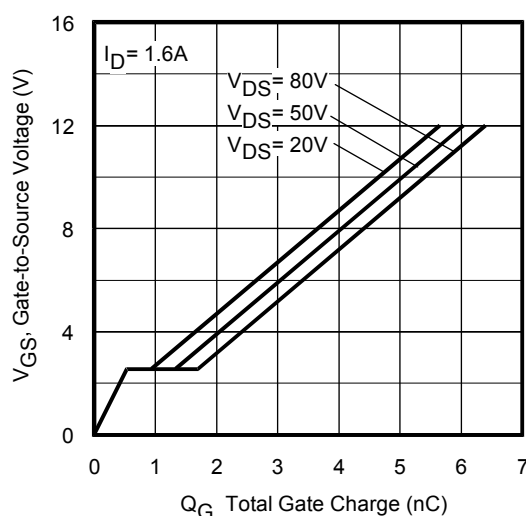


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

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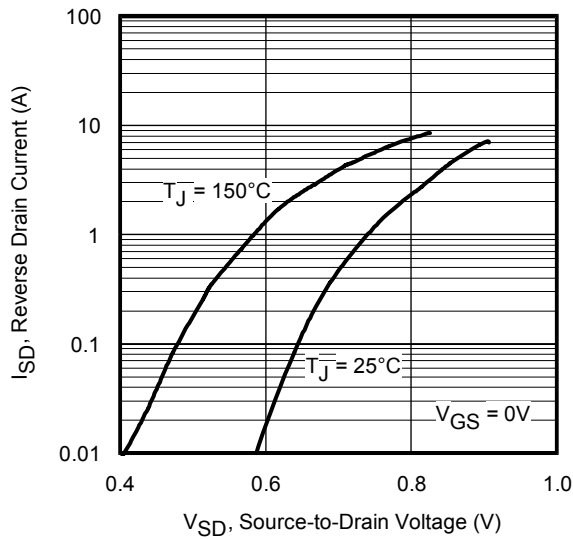


Fig 7. Typical Source-Drain Diode Forward Voltage

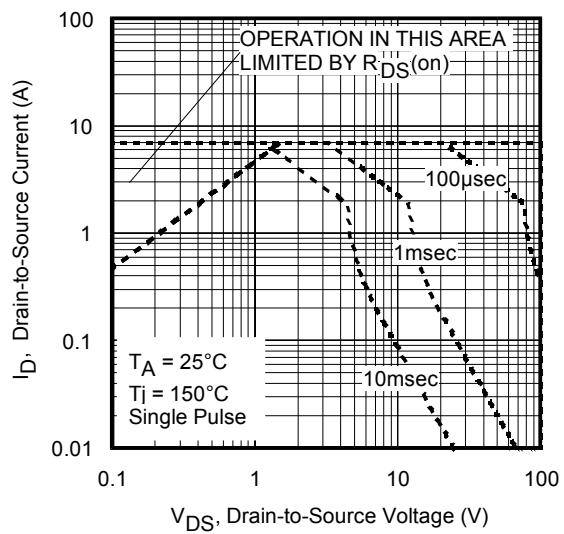


Fig 8. Maximum Safe Operating Area

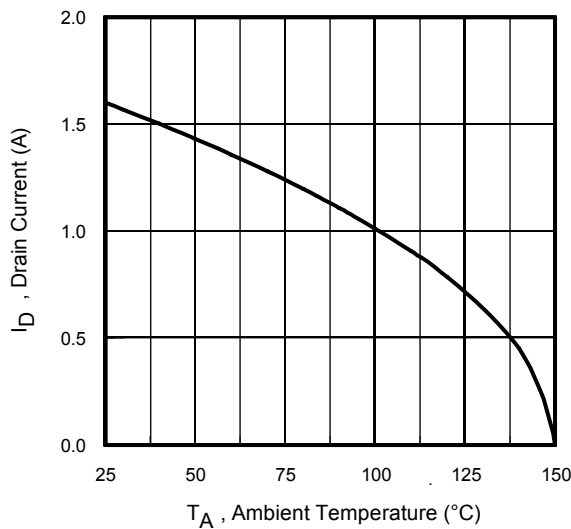


Fig 9. Maximum Drain Current Vs. Ambient Temperature

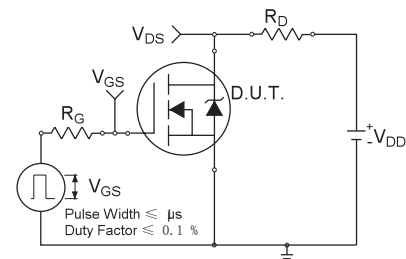


Fig 10a. Switching Time Test Circuit

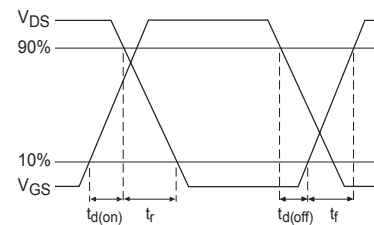


Fig 10b. Switching Time Waveforms

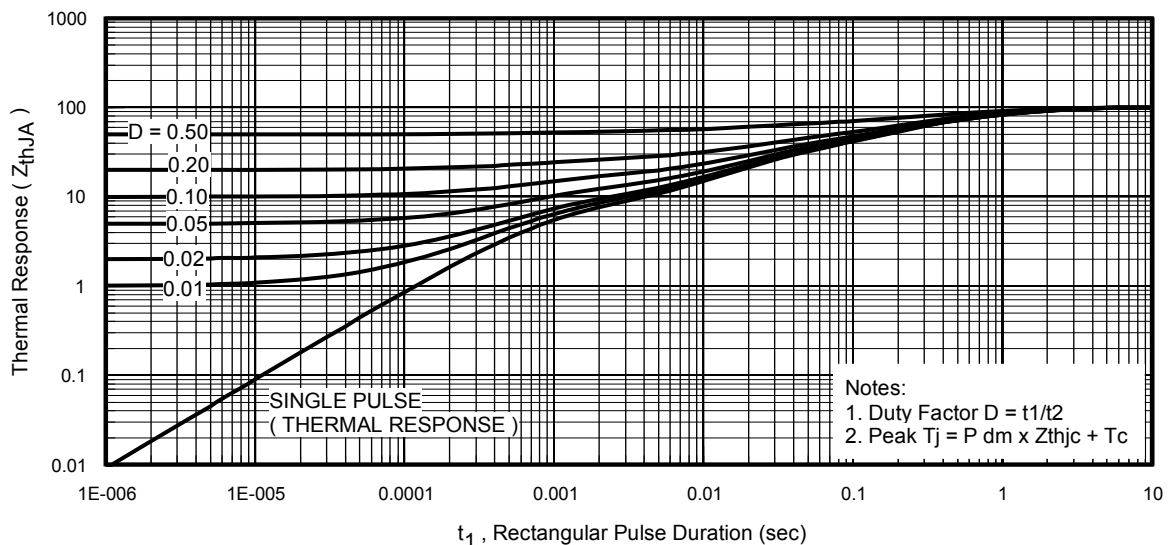


Fig 11. Typical Effective Transient Thermal Impedance, Junction-to-Ambient

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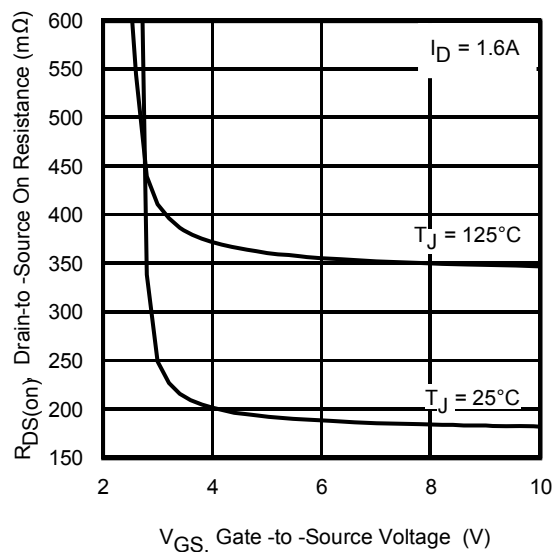


Fig 12. Typical On-Resistance Vs. Gate Voltage

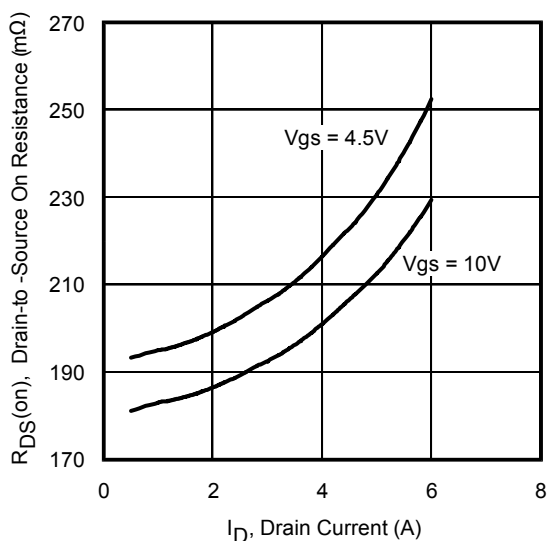


Fig 13. Typical On-Resistance Vs. Drain Current

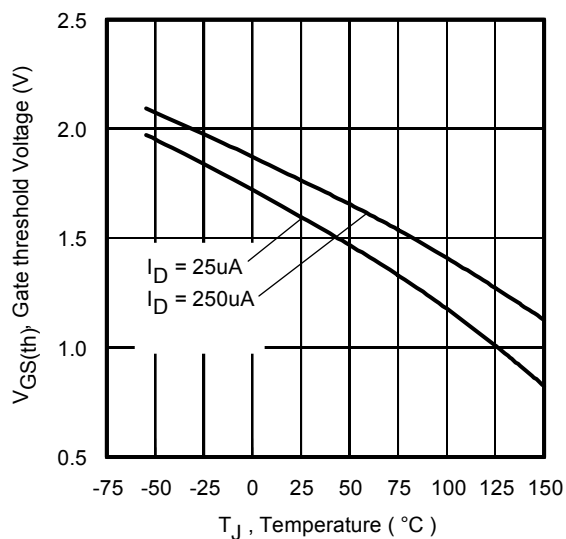


Fig 14. Typical Threshold Voltage Vs. Junction Temperature

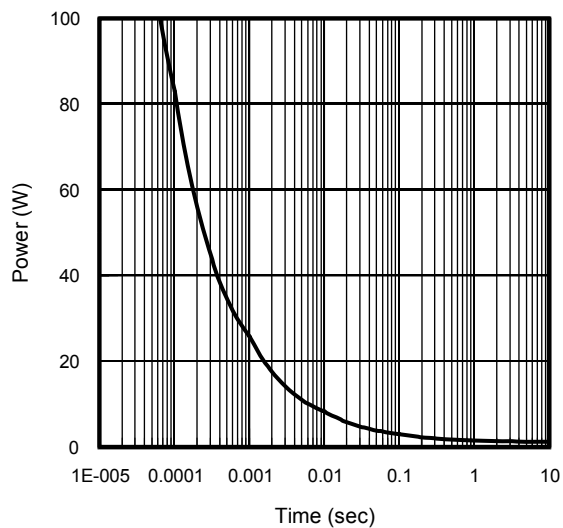


Fig 15. Typical Power Vs. Time

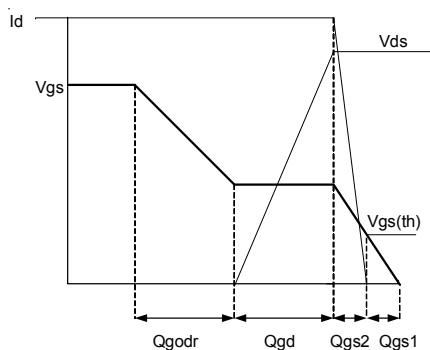


Fig 16a. Basic Gate Charge Waveform

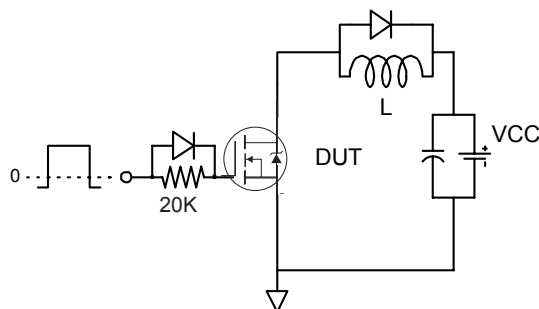
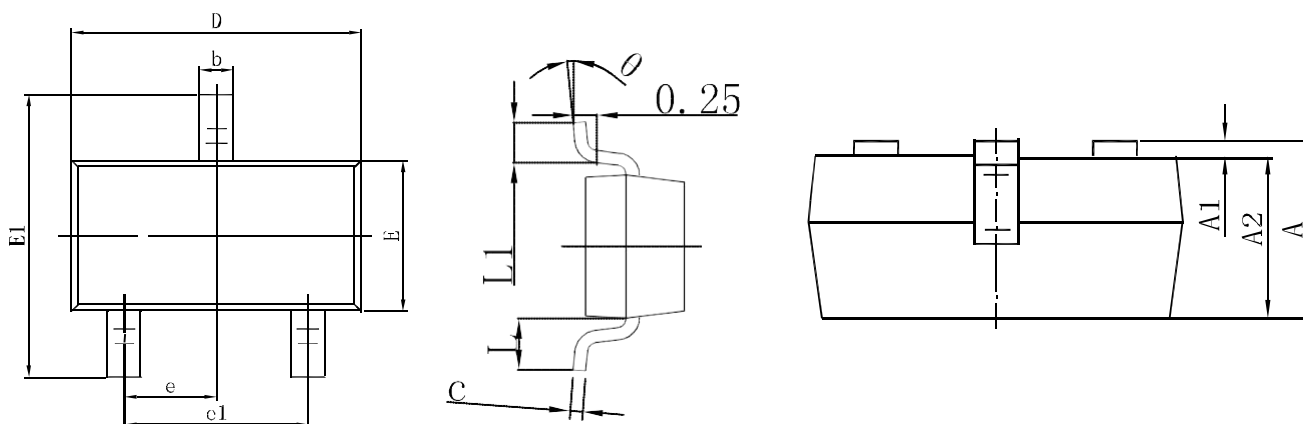
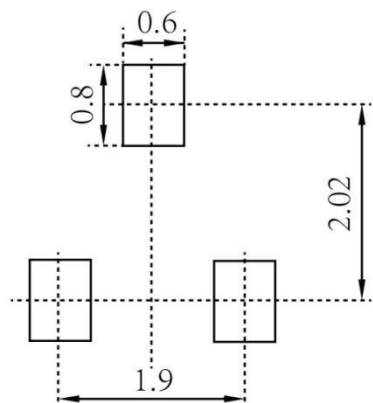


Fig 16b. Gate Charge Test Circuit

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SOT-23 Package Outline Dimensions


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

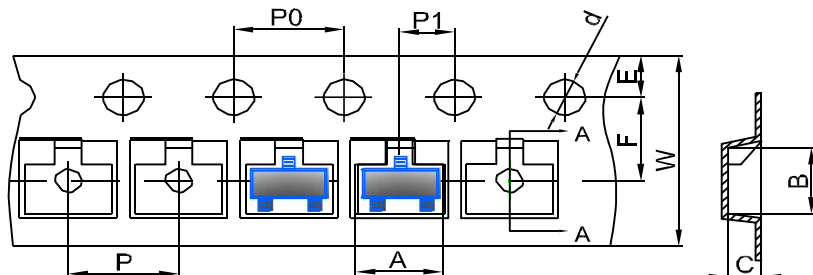
SOT-23 Suggested Pad Layout

Note:

1. Controlling dimension: in millimeters
2. General tolerance: $\pm 0.05\text{mm}$
3. The pad layout is for reference purposes only

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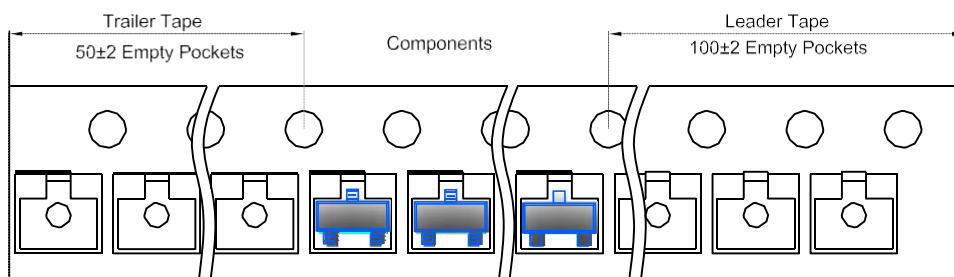
SOT-23 Tape and Reel

SOT-23 Embossed Carrier Tape

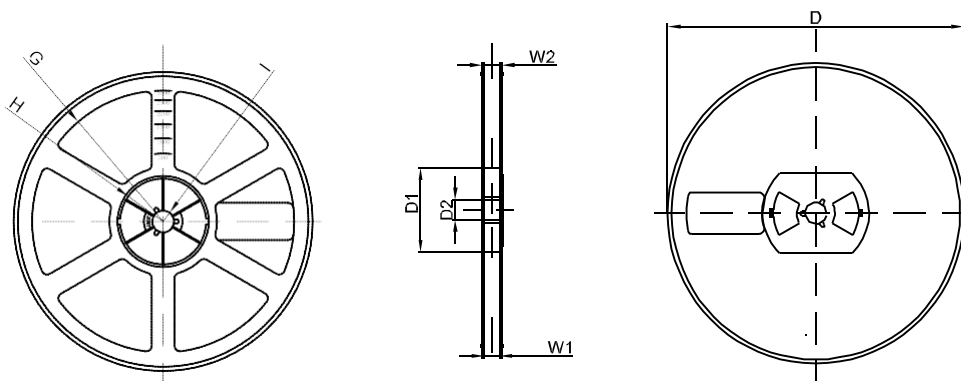


DIMENSIONS ARE IN MILLIMETER										
TYPE	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

SOT-23 Tape Leader and Trailer



SOT-23 Reel



DIMENSIONS ARE IN MILLIMETER								
REEL OPTION	D	D1	D2	G	H	I	W1	W2
7" DIA	Ø178	54.40	13.00	R78	R25.60	R6.50	9.50	12.30
TOLERANCE	±2	±1	±1	±1	±1	±1	±1	±1