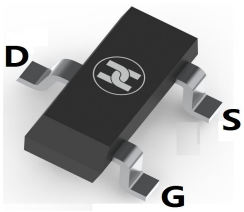
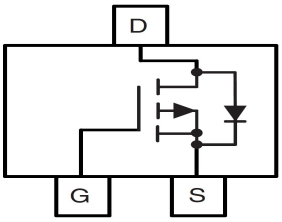
LOW VOLTAGE MOSFET (P-CHANNEL)

V_{DS}	-30	V
$V_{GS\ Max}$	± 20	V
$R_{DS(on)\ max}$ (@V_{GS} = -10V)	64	mΩ
$R_{DS(on)\ max}$ (@V_{GS} = -4.5V)	103	mΩ



SOT-23



Application(s)

- System/Load Switch

Features and Benefits

Features		Benefits
Low $R_{DS(on)}$ (≤ 64mΩ)		Lower switching losses
Industry-standard pinout		Multi-vendor compatibility
Compatible with existing Surface Mount Techniques	results in	Easier manufacturing
RoHS compliant containing no lead, no bromide and no halogen	⇒	Environmentally friendly
MSL1, Consumer qualification		Increased reliability

Symbol	Parameter	Max.	Units
V_{DS}	Drain-Source Voltage	-30	V
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	-3.6	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	-2.9	
I_{DM}	Pulsed Drain Current	-15	
P_D @T_A = 25°C	Maximum Power Dissipation	1.3	W
P_D @T_A = 70°C	Maximum Power Dissipation	0.8	
	Linear Derating Factor	0.01	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

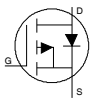
Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient ③	——	100	°C/W
$R_{\theta JA}$	Junction-to-Ambient (t<10s) ④	——	99	

LOW VOLTAGE MOSFET (P-CHANNEL)

Electric Characteristics @ T_J = 25°C (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-30	——	——	V	V_{GS} = 0V, I_D = -250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	——	0.02	——	V/°C	Reference to 25°C, I_D = -1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	——	51	64	mΩ	V_{GS} = -10V, I_D = -3.6A ②
		——	82	103		V_{GS} = -4.5V, I_D = -2.9A ②
$V_{GS(th)}$	Gate Threshold Voltage	1.2		2.4	V	V_{DS} = V_{GS}, I_D = -10μA
I_{DSS}	Drain-to-Source Leakage Current	——	——	1	μA	V_{DS} =-24V, V_{GS} = 0V
		——	——	150		V_{DS} = -24V, V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate-to-Source Forward Leakage	——	——	-100	nA	V_{GS} = -20V
	Gate-to-Source Reverse Leakage	——	——	100		V_{GS} = 20V
R_G	Internal Gate Resistance	——	12	——	Ω	
gfs	Forward Transconductance	3.5			S	V_{DS} = -10V, I_D =-3.6A
Q_g	Total Gate Charge	——	4.8	——	nC	I_D = -3.6A
Q_{gs}	Gate-to-Source Charge	——	1.2	——		V_{DS} =-15V
Q_{gd}	Gate-to-Drain ("Miller") Charge	——	2.5	——		V_{GS} = -4.5V ②
$t_{d(on)}$	Turn-On Delay Time	——	9.6	——	ns	V_{DD} =-15V②
t_r	Rise Time	——	19	——		I_D = -1A
$t_{d(off)}$	Turn-Off Delay Time	——	16	——		R_G = 6.8Ω
t_f	Fall Time	——	15	——		V_{GS} = -4.5V
C_{iss}	Input Capacitance	——	388	——	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	——	93	——		V_{DS} = -25V
C_{rss}	Reverse Transfer Capacitance	——	65	——		f = 1.0KHz

Source - Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	——	——	-1.3	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	——	——	-15		
V_{SD}	Diode Forward Voltage	——	——	-1.2	V	T_J = 25°C, I_S = -1.3A, V_{GS} = 0V ②
t_{rr}	Reverse Recovery Time	——	14	21	ns	T_J = 25°C, V_R = -24V, I_F=-1.3A
Q_{rr}	Reverse Recovery Charge	——	7.2	11	nC	di/dt = 100A/μs ②

LOW VOLTAGE MOSFET (P-CHANNEL)

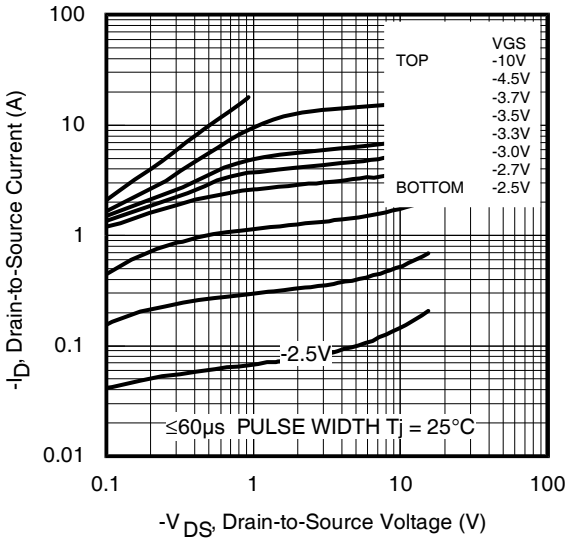


Fig 1. Typical Output Characteristics

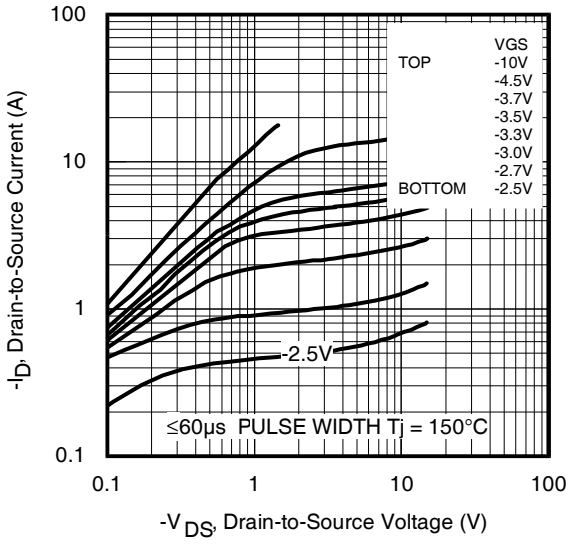


Fig 2. Typical Output Characteristics

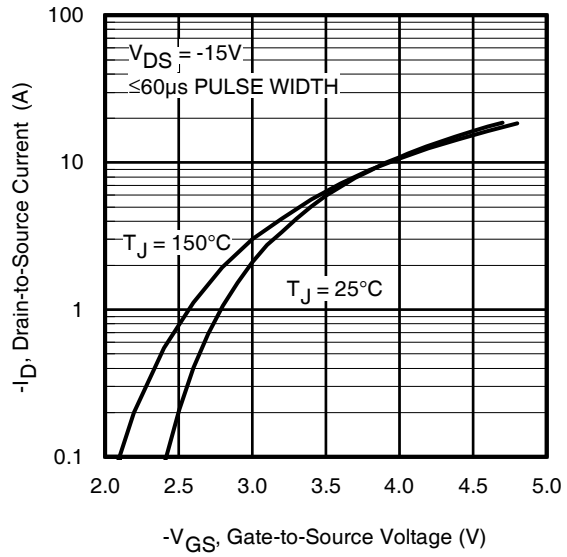


Fig 3. Typical Transfer Characteristics

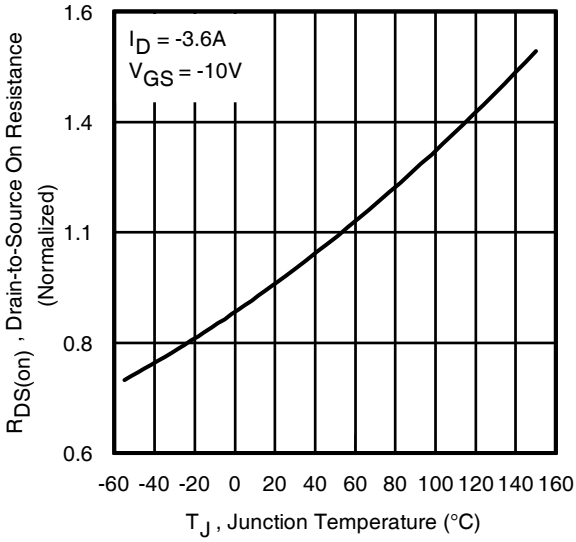


Fig 4. Normalized On-Resistance Vs. Temperature

LOW VOLTAGE MOSFET (P-CHANNEL)

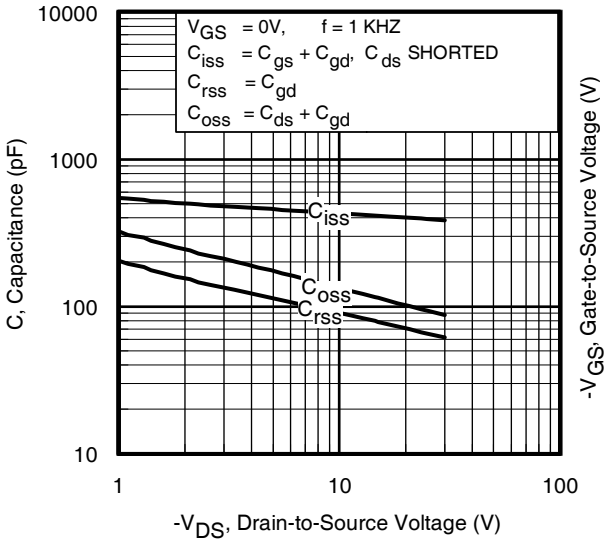


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

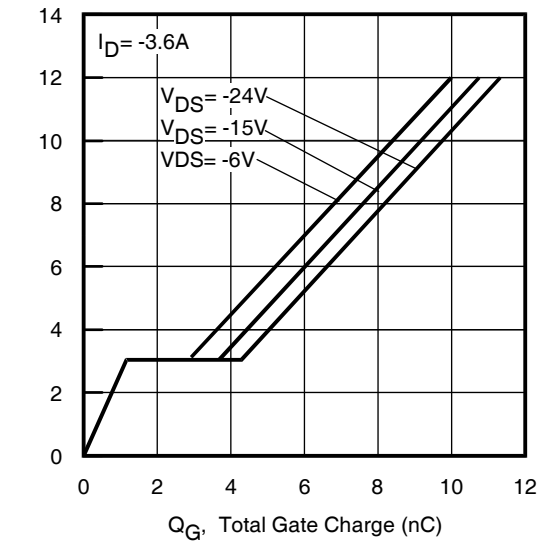


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

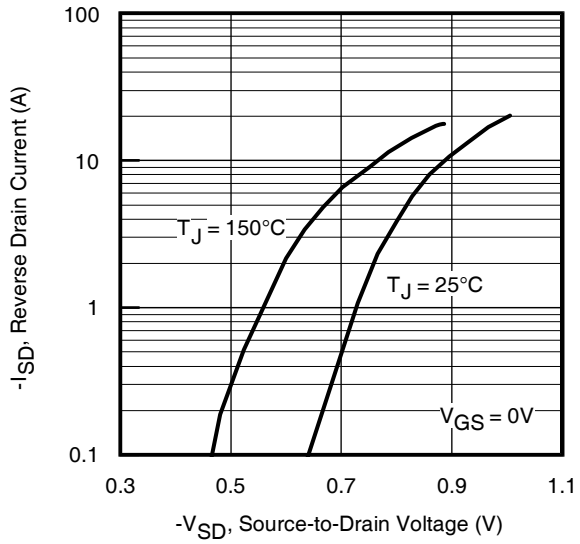


Fig 7. Typical Source-Drain Diode Forward Voltage

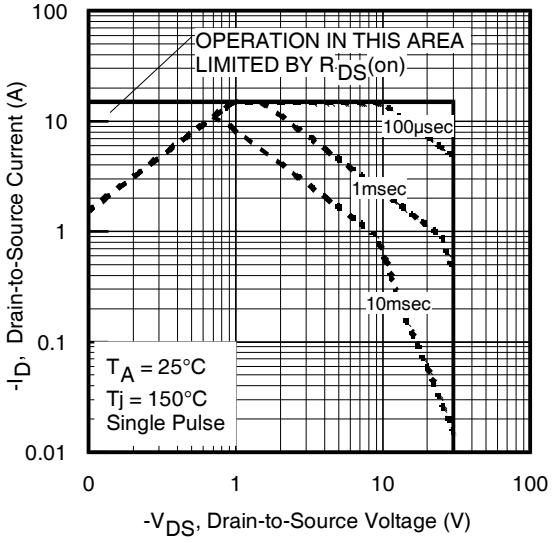


Fig 8. Maximum Safe Operating Area

LOW VOLTAGE MOSFET (P-CHANNEL)

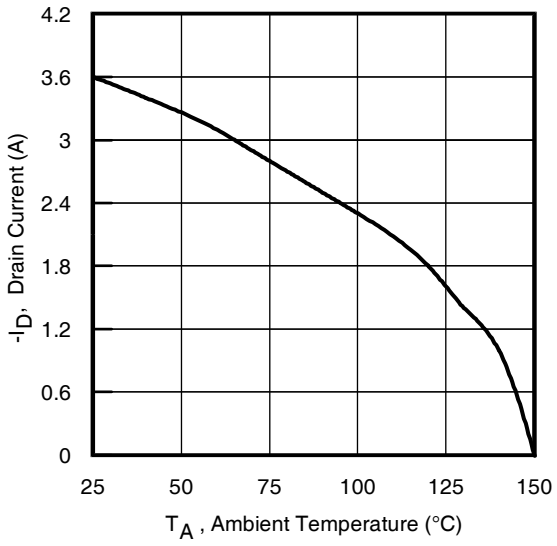


Fig 9. Maximum Drain Current Vs. Ambient Temperature

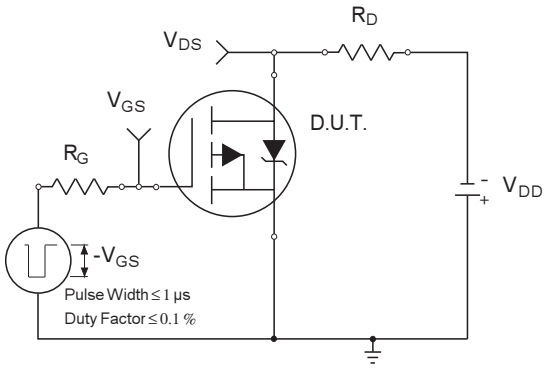


Fig 10a. Switching Time Test Circuit

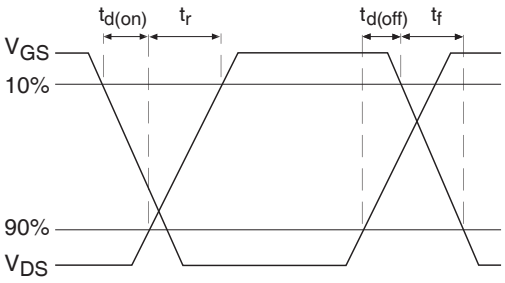


Fig 10b. Switching Time Waveforms

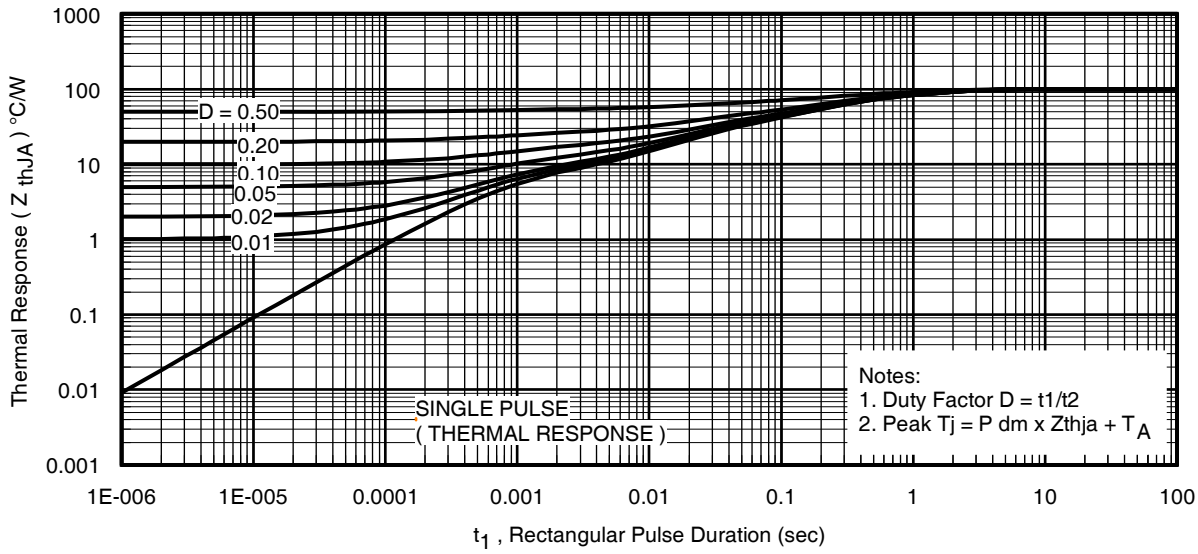


Fig 11. Typical Effective Transient Thermal Impedance, Junction-to-Ambient

LOW VOLTAGE MOSFET (P-CHANNEL)

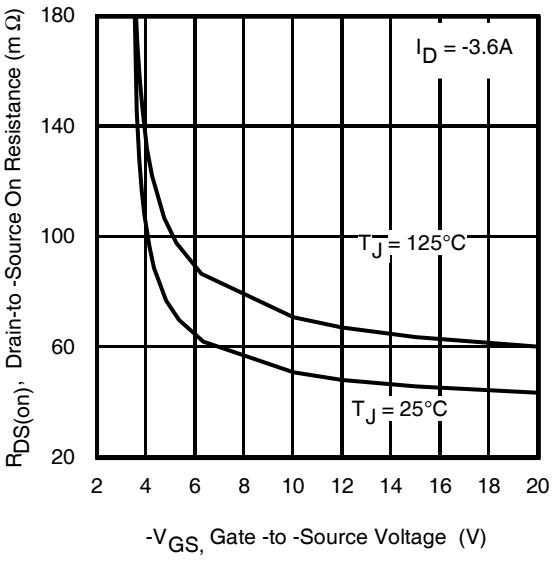


Fig 12. Typical On-Resistance Vs. Gate Voltage

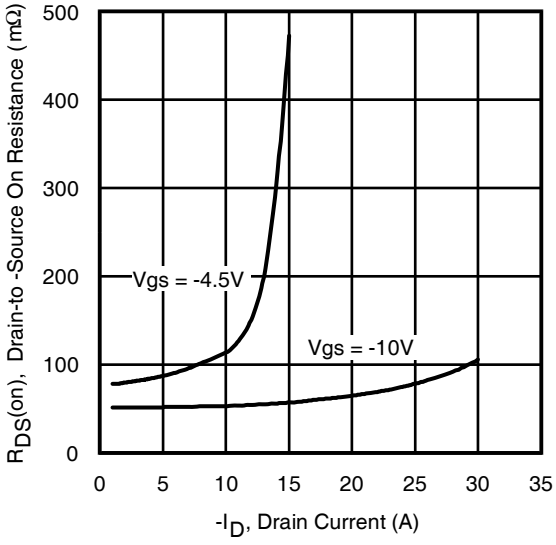


Fig 13. Typical On-Resistance Vs. Drain Current

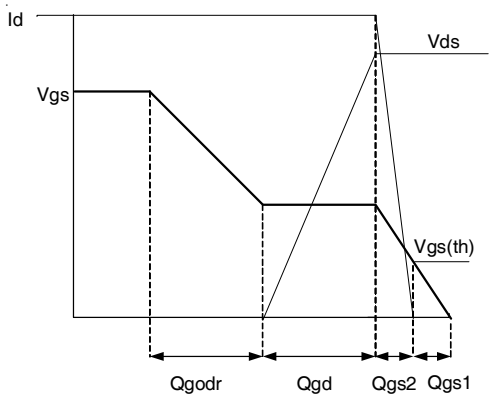


Fig 14a. Gate Charge Waveform

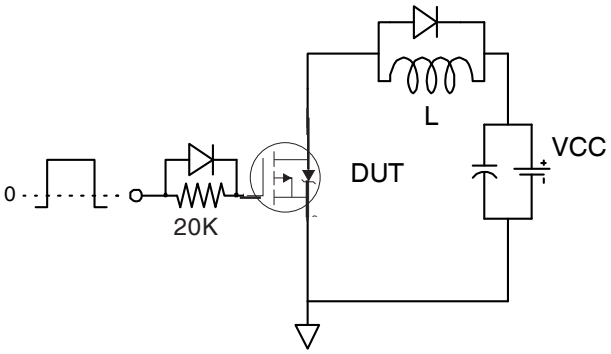


Fig 14b. Gate Charge Test Circuit

LOW VOLTAGE MOSFET (P-CHANNEL)

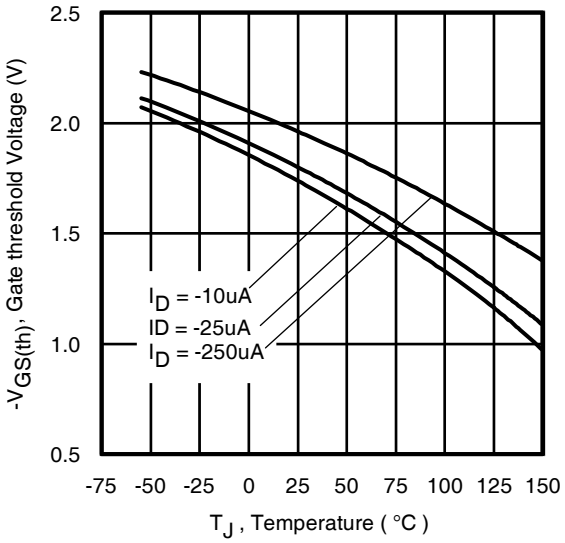


Fig 15. Typical Threshold Voltage Vs. Junction Temperature

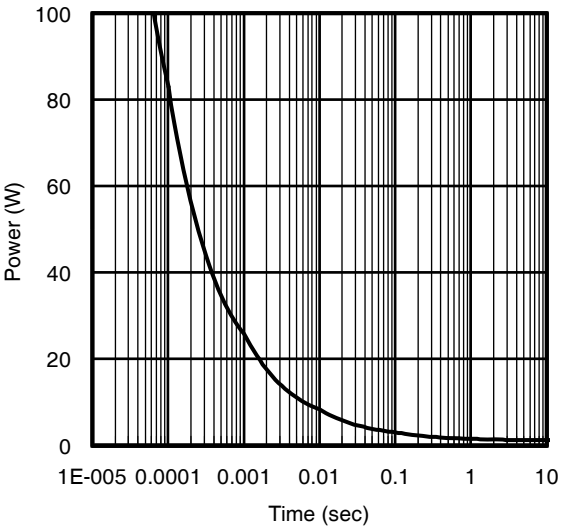
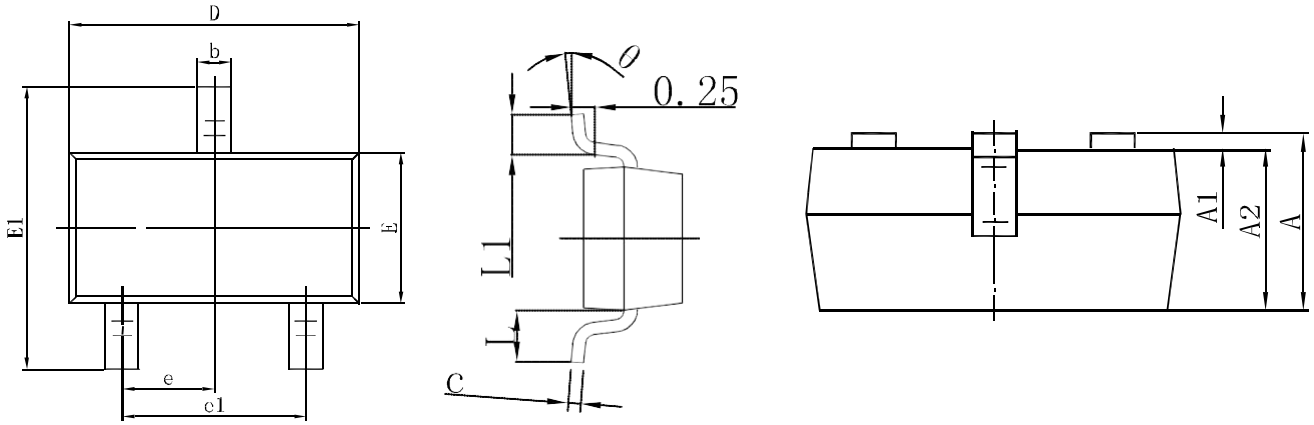


Fig 16. Typical Power Vs. Time

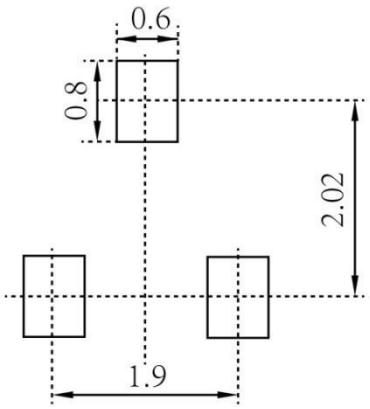
LOW VOLTAGE MOSFET (P-CHANNEL)

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

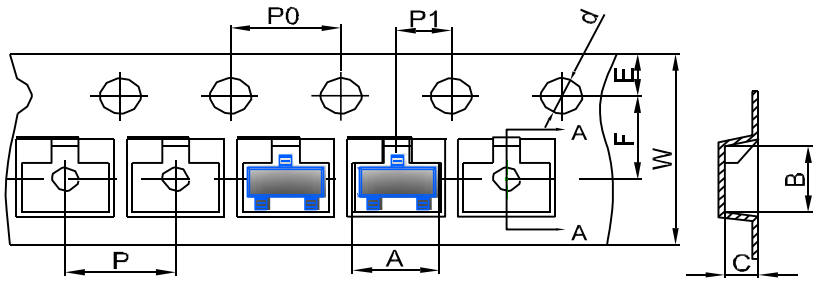
2.General tolerance: ±0.05mm

3.The pad layout is for reference purposes only

LOW VOLTAGE MOSFET (P-CHANNEL)

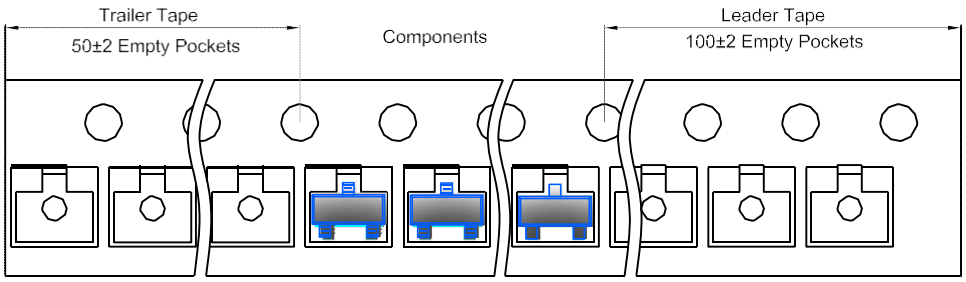
SOT-23 Tape and Reel

SOT-23 Embossed Carrier Tape

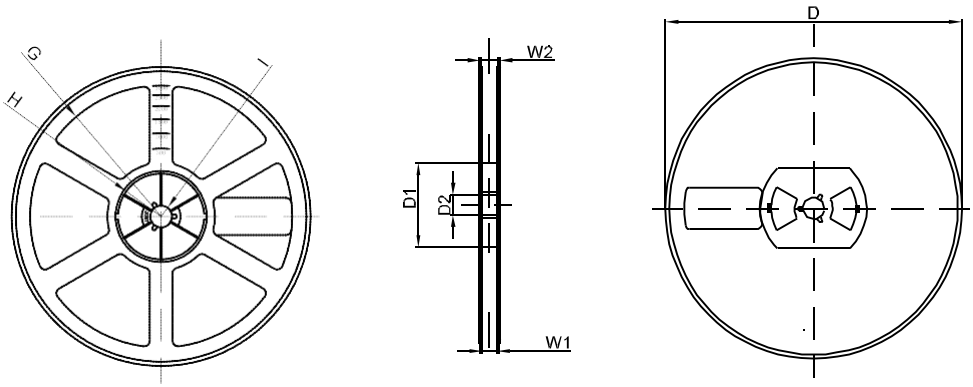


	DIMENSIONS ARE IN MILLIMETER									
TYPE	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

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