

Description
N-channel Enhancement MOSFET
Features

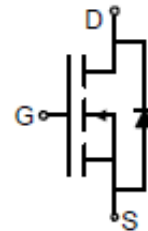
- $V_{DS}=60V$, $I_D=3A$
- $R_{DS(ON)} < 100m\Omega$ @ $V_{GS} = 10V$
 $R_{DS(ON)} < 115m\Omega$ @ $V_{GS} = 4.5V$
- High Power and Current Handling Capability
- Lead Free Product is Acquired
- Surface Mount Package

Application

- Battery Protection
- Load Switch
- Power Management

Package


SOT-23


Absolute Maximum Ratings ($T_C=25^\circ C$ unless otherwise specified)

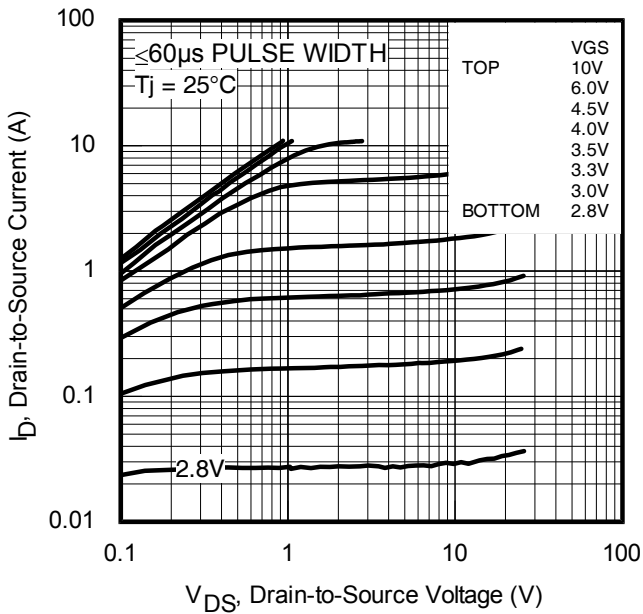
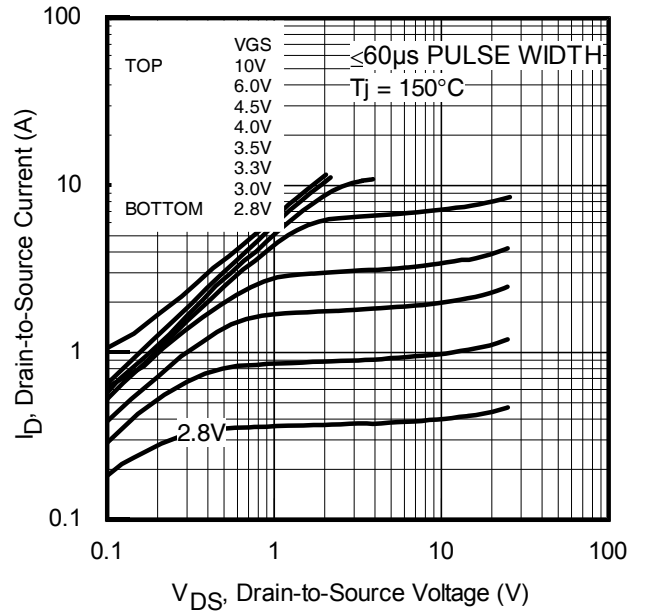
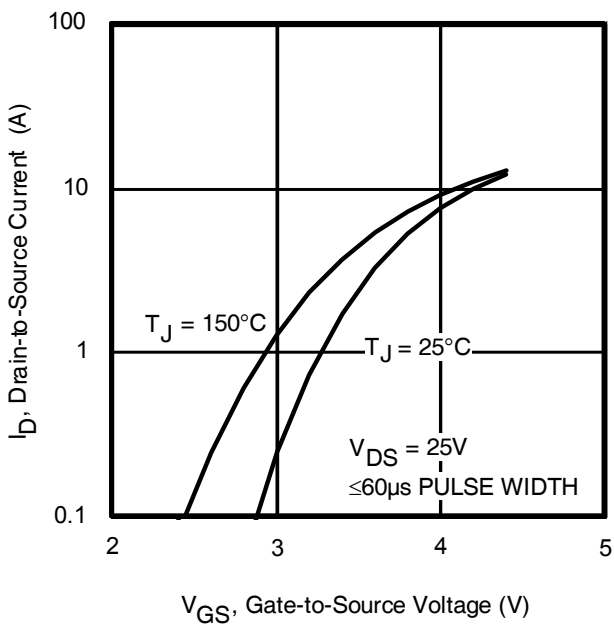
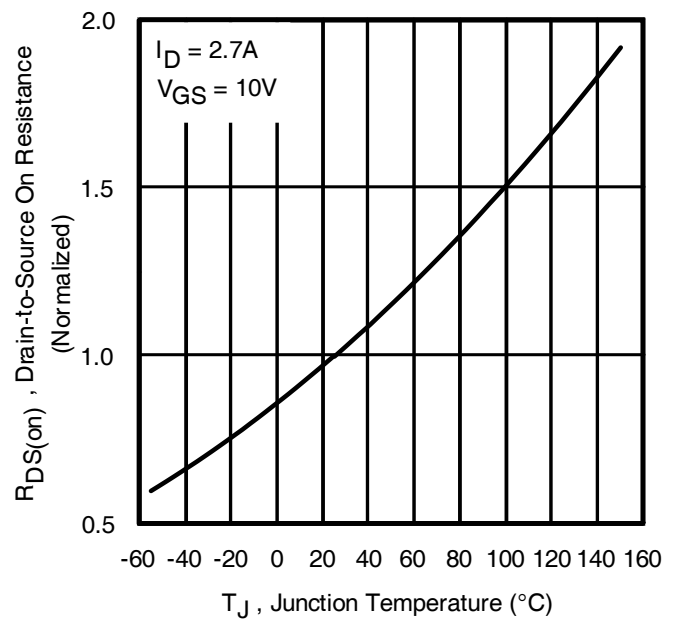
Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	60	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_C = 25^\circ C$	3
		$T_C = 100^\circ C$	2
I_{DM}	Pulsed Drain Current ^{note1}	10	A
P_D	Power Dissipation	$T_A = 25^\circ C$	0.35
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ C$

Electrical Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V,$	-	-	1	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	-	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note2</small>	$V_{GS}=10V, I_D=2A$	-	-	100	m Ω
		$V_{GS}=4.5V, I_D=1A$	-	-	115	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=30V, V_{GS}=0V,$ $f=1.0MHz$	-	250	-	pF
C_{oss}	Output Capacitance		-	26	-	pF
C_{rss}	Reverse Transfer Capacitance		-	20	-	pF
Q_g	Total Gate Charge	$V_{DS}=30V, I_D=3A,$ $V_{GS}=4.5V$	-	7	-	nC
Q_{gs}	Gate-Source Charge		-	1.2	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	1.5	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=30V, I_D=1.5A,$ $R_{GEN}=1\Omega, V_{GS}=10V,$	-	6.5	-	ns
t_r	Turn-on Rise Time		-	15.2	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	15.2	-	ns
t_f	Turn-off Fall Time		-	10.3	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	3	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	10	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=1A$	-	-	1.2	V

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$


Fig. 1 Typical Output Characteristics

Fig. 2 Typical Output Characteristics

Fig. 3 Typical Transfer Characteristics

Fig. 4 Normalized On-Resistance vs. Temperature

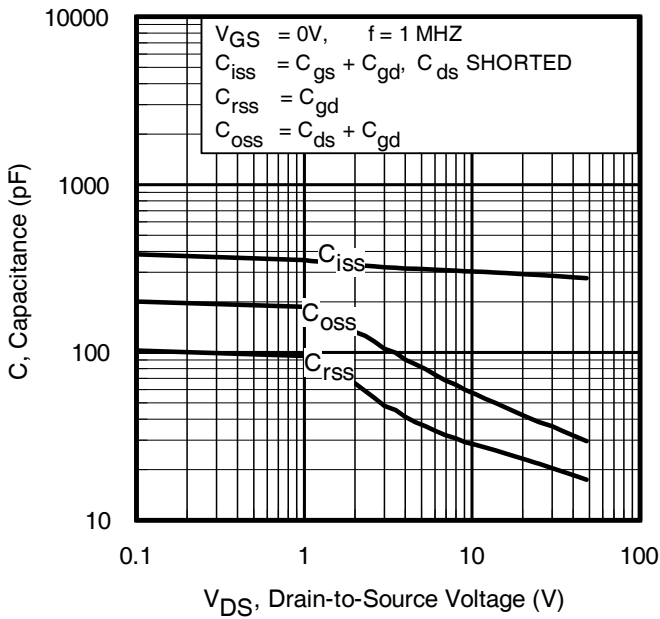


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

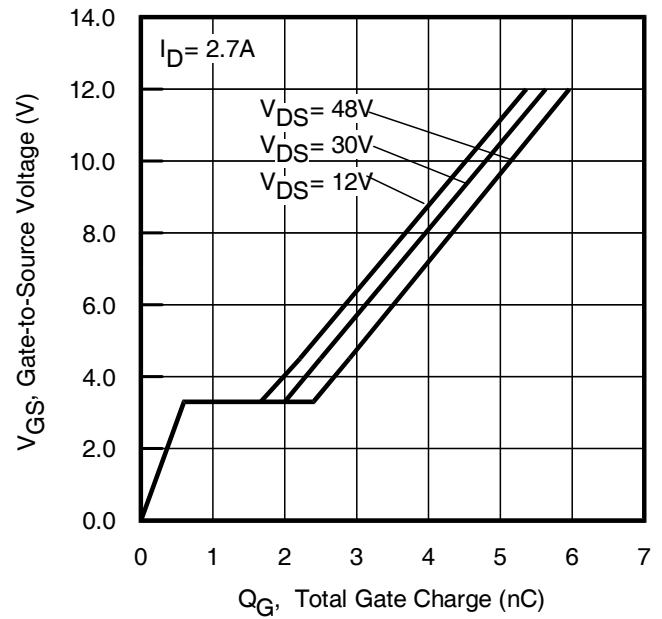


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

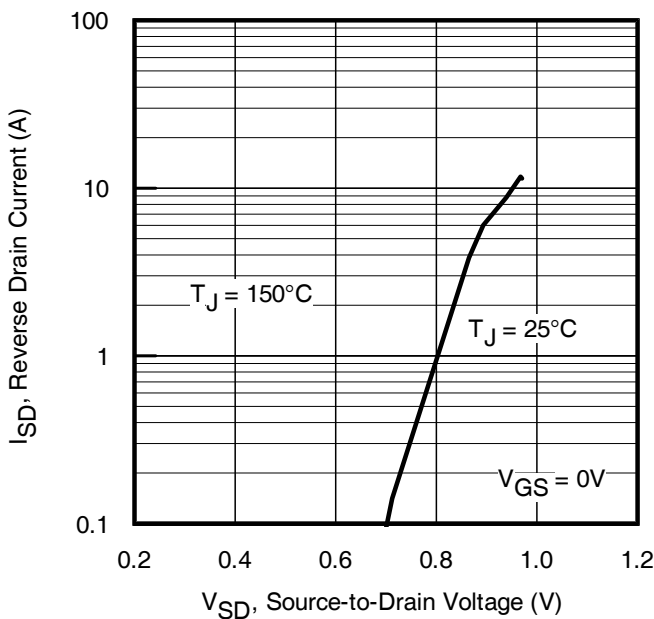


Fig. 7 Typical Source-to-Drain Diode Forward Voltage

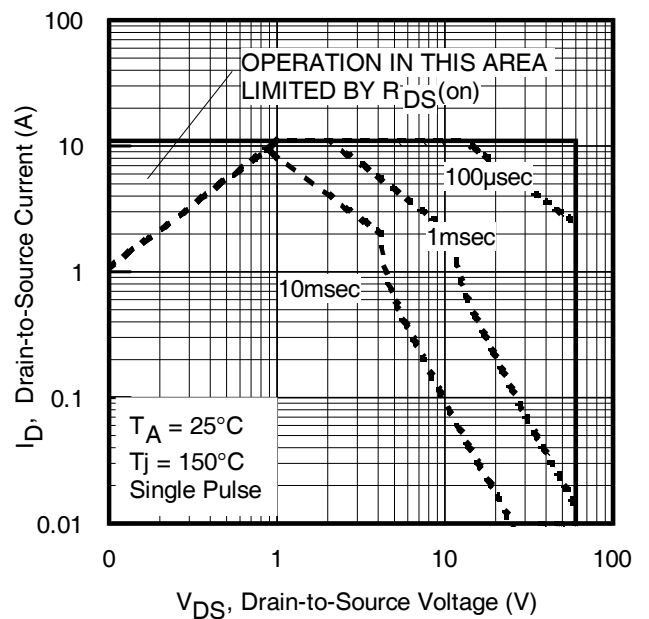
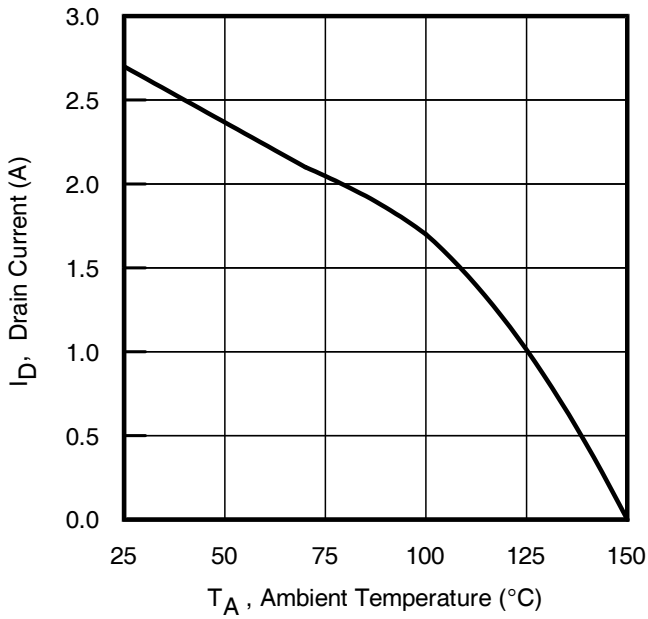
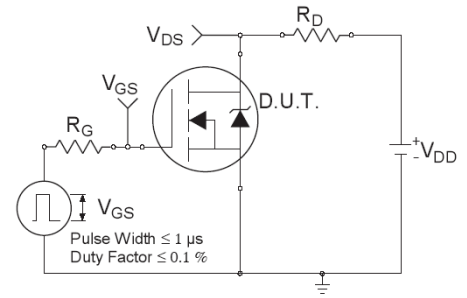
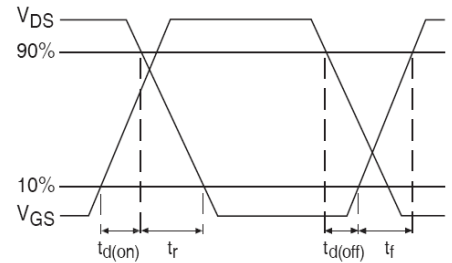
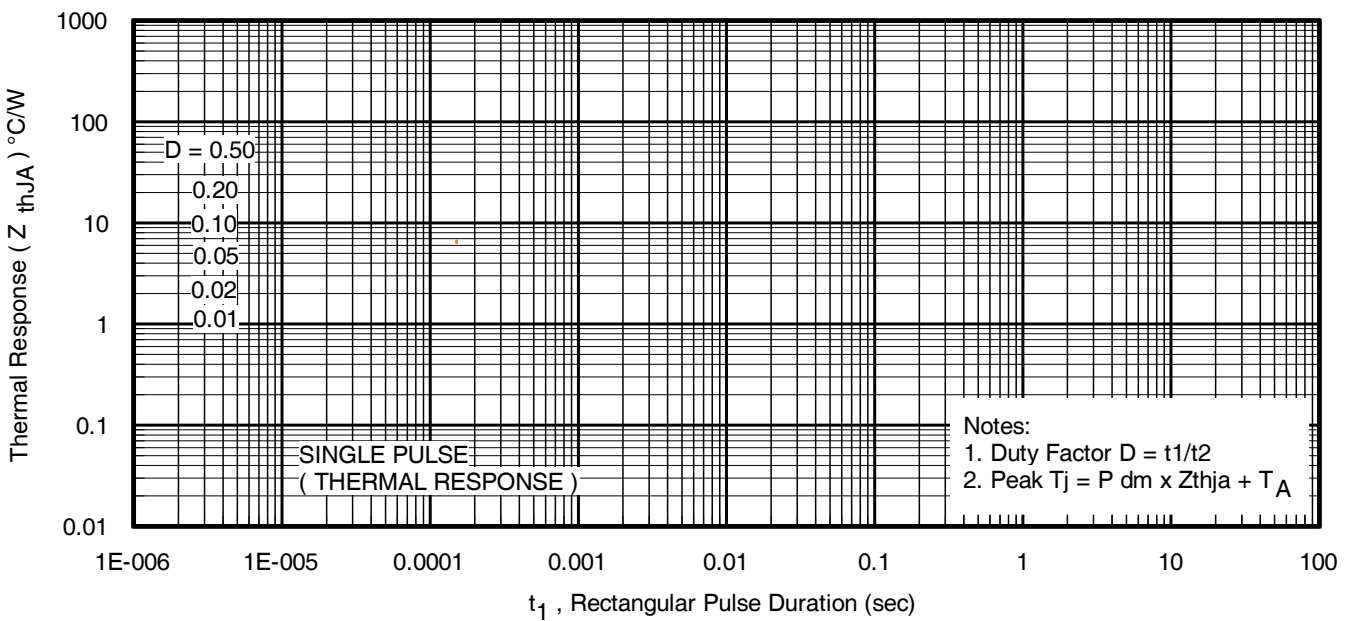
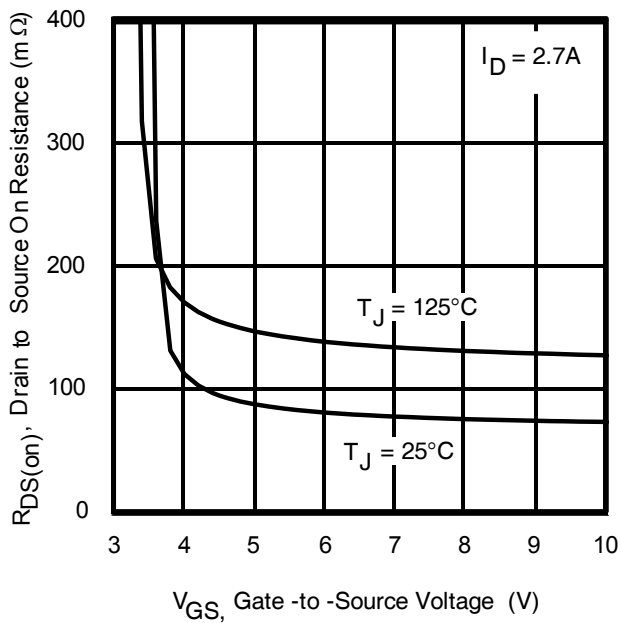
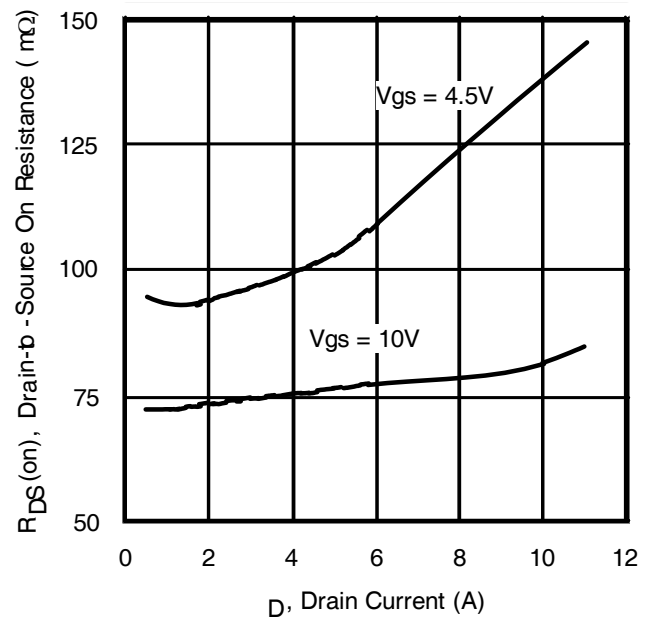
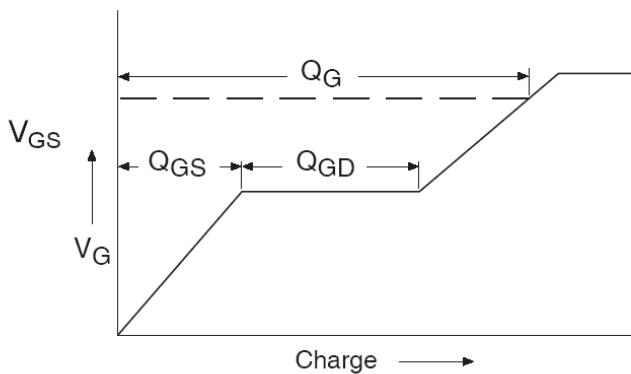
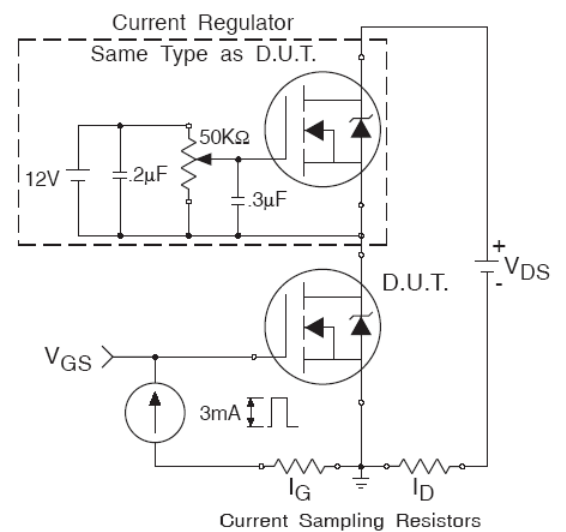


Fig 8. Maximum Safe Operating Area
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Fig 9. Maximum Drain Current vs. Case Temperature

Fig 10a. Switching Time Test Circuit

Fig 10b. Switching Time Waveforms

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


Fig 12. Typical On-Resistance Vs. Gate Voltage

Fig 13. Typical On-Resistance Vs. Drain Current

Fig 14a. Basic Gate Charge Waveform

Fig 14b. Gate Charge Test Circuit

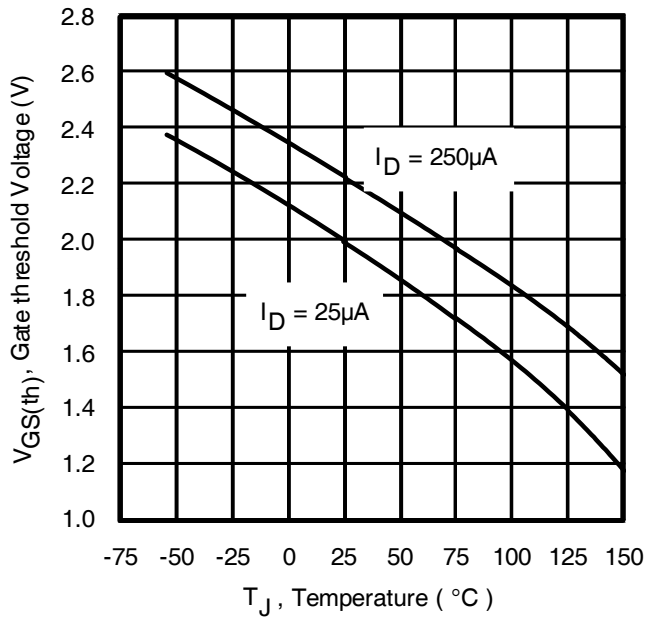


Fig 15. Typical Threshold Voltage Vs. Junction Temperature

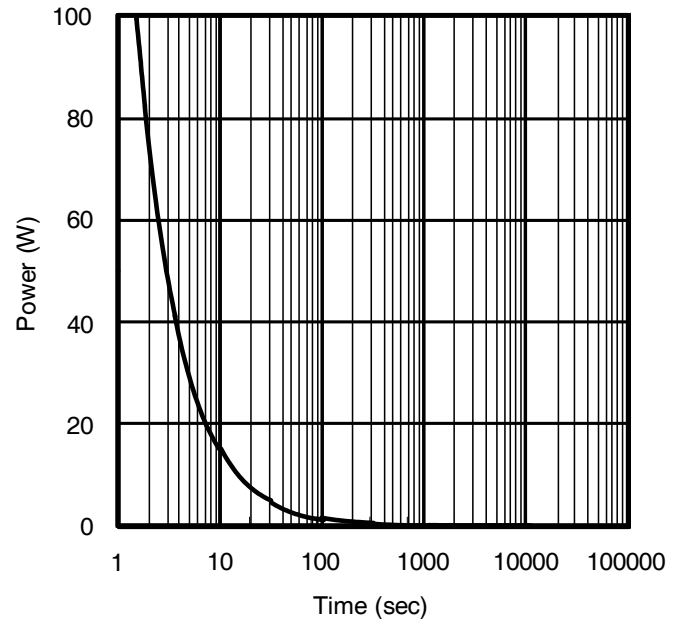
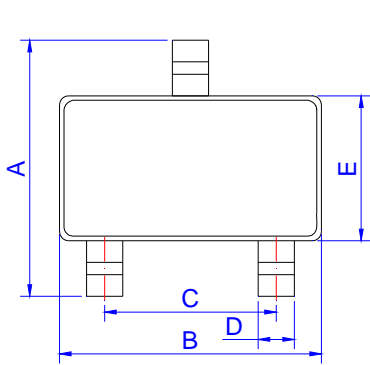
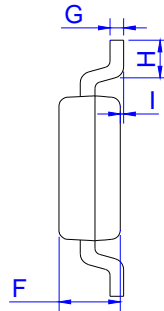


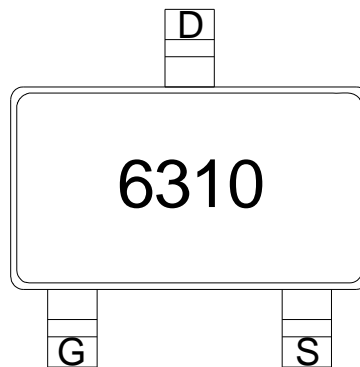
Fig 16. Typical Power Vs. Time

Package Mechanical Data


SOT-23



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.30	2.40	2.50	0.091	0.095	0.098
B	2.80	2.90	3.00	0.110	0.114	0.118
C	1.90 REF			0.075 REF		
D	0.35	0.40	0.45	0.014	0.016	0.018
E	1.20	1.30	1.40	0.047	0.051	0.055
F	0.90	1.00	1.10	0.035	0.039	0.043
G		0.10	0.15		0.004	0.006
H	0.20			0.008		
I	0		0.10	0		0.004

Marking


S10: Device Code

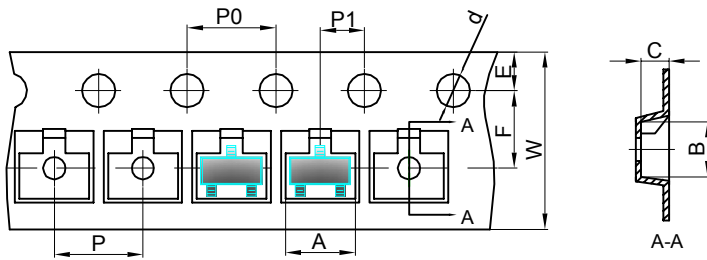
Ordering Information-SOT-23

OUTLINE	PACKAGE TYPE	QUANTITY REEL	DESCRIPTION
TAPING	SOT-23	3,000pcs	7 inch reel pack



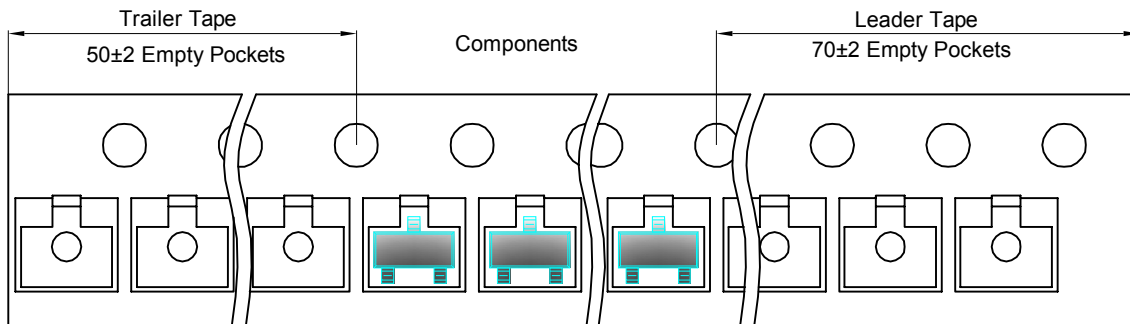
SOT23 Tape and reel

SOT23 Embossed Carrier Tape



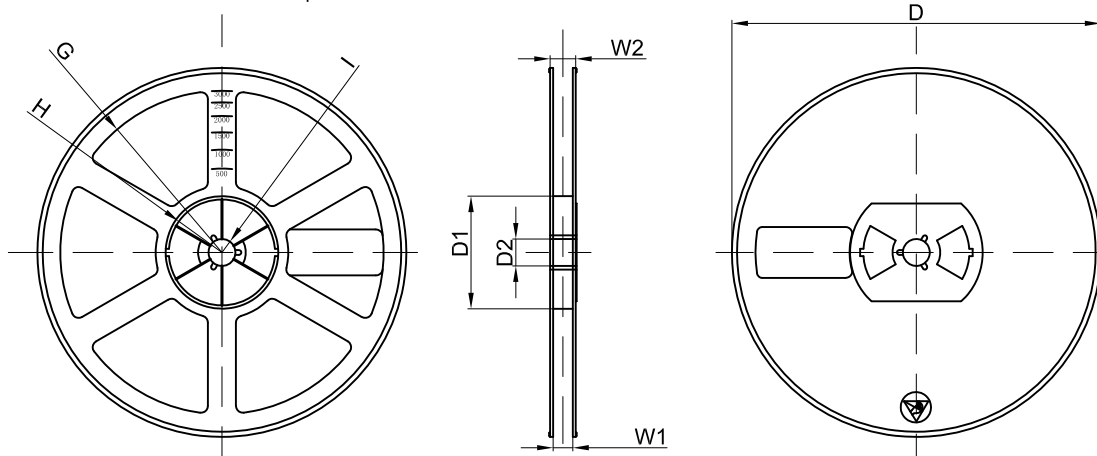
Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT23 Tape Leader and Trailer



SOT23 Reel

3000 pcs



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

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