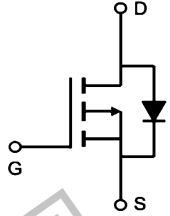
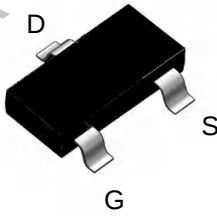
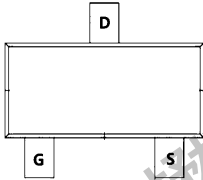


TM08P02I

P-Channel Enhancement Mosfet

General Description • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant Applications • Load switch • PWM	General Features $V_{DS} = -20V$ $I_D = -8.0A$ $R_{DS(ON)} = 17\text{ m}\Omega$ (typ.) @ $V_{GS} = -4.5\text{ V}$ 100% UIS Tested 100% R_g Tested 																																																			
I: SOT-23  Marking: 20P07 OR 2333																																																				
Absolute Maximum Ratings ($T_A = 25^{\circ}\text{C}$ Unless Otherwise Noted) <table><tr><th>Symbol</th><th>Parameter</th><th>Rating</th><th>Units</th></tr><tr><td>V_{DS}</td><td>Drain-Source Voltage</td><td>-20</td><td>V</td></tr><tr><td>V_{GS}</td><td>Gate-Source Voltage</td><td>± 12</td><td>V</td></tr><tr><td>$I_D@T_A=25^{\circ}\text{C}$</td><td>Continuous Drain Current, V_{GS} @ -4.5V¹</td><td>-8.0</td><td>A</td></tr><tr><td>$I_D@T_A=70^{\circ}\text{C}$</td><td>Continuous Drain Current, V_{GS} @ -4.5V¹</td><td>-5.0</td><td>A</td></tr><tr><td>I_{DM}</td><td>Pulsed Drain Current²</td><td>-25.8</td><td>A</td></tr><tr><td>$P_D@T_A=25^{\circ}\text{C}$</td><td>Total Power Dissipation³</td><td>1.9</td><td>W</td></tr><tr><td>T_{STG}</td><td>Storage Temperature Range</td><td>-55 to 175</td><td>$^{\circ}\text{C}$</td></tr><tr><td>T_J</td><td>Operating Junction Temperature Range</td><td>-55 to 175</td><td>$^{\circ}\text{C}$</td></tr></table> Thermal Data <table><tr><th>Symbol</th><th>Parameter</th><th>Typ.</th><th>Max.</th><th>Unit</th></tr><tr><td>$R_{\theta JA}$</td><td>Thermal Resistance Junction-ambient ¹</td><td>---</td><td>65</td><td>$^{\circ}\text{C/W}$</td></tr><tr><td>$R_{\theta JC}$</td><td>Thermal Resistance Junction-Case¹</td><td>---</td><td>80</td><td>$^{\circ}\text{C/W}$</td></tr></table>		Symbol	Parameter	Rating	Units	V_{DS}	Drain-Source Voltage	-20	V	V_{GS}	Gate-Source Voltage	± 12	V	$I_D@T_A=25^{\circ}\text{C}$	Continuous Drain Current, V_{GS} @ -4.5V ¹	-8.0	A	$I_D@T_A=70^{\circ}\text{C}$	Continuous Drain Current, V_{GS} @ -4.5V ¹	-5.0	A	I_{DM}	Pulsed Drain Current ²	-25.8	A	$P_D@T_A=25^{\circ}\text{C}$	Total Power Dissipation ³	1.9	W	T_{STG}	Storage Temperature Range	-55 to 175	$^{\circ}\text{C}$	T_J	Operating Junction Temperature Range	-55 to 175	$^{\circ}\text{C}$	Symbol	Parameter	Typ.	Max.	Unit	$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	65	$^{\circ}\text{C/W}$	$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	80	$^{\circ}\text{C/W}$
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TM08P02I
P-Channel Enhancement Mosfet
Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D= -250\mu A$	-20			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}= -12V, V_{GS}=0V,$	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}= \pm 12V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D= -250\mu A$	-0.4	-0.65	-1.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note2	$V_{GS}= -4.5V, I_D= -7A$	-	17	23	m Ω
		$V_{GS}= -2.5V, I_D= -5A$	-	24	33	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}= -6V, V_{GS}=0V,$ $f=1.0MHz$	-	980	-	pF
C_{oss}	Output Capacitance		-	302	-	pF
C_{rss}	Reverse Transfer Capacitance		-	279	-	pF
Q_g	Total Gate Charge	$V_{DS}= -6V, I_D= -7A,$ $V_{GS}= -4.5V$	-	19	-	nC
Q_{gs}	Gate-Source Charge		-	4	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	5	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}= -6V, I_D= -4A,$ $V_{GS}= -4.5V,$ $R_{GEN}=2.5\Omega$	-	11	-	ns
t_r	Turn-on Rise Time		-	36	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	29	-	ns
t_f	Turn-off Fall Time		-	8	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-8	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-28	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S= -7A$	-	-0.8	-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 $\leq 2\%$

Typical Performance Characteristics

Figure 1: Output Characteristics

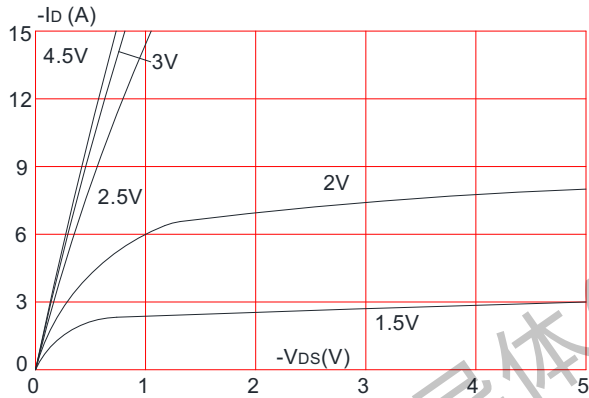


Figure 2: Typical Transfer Characteristics

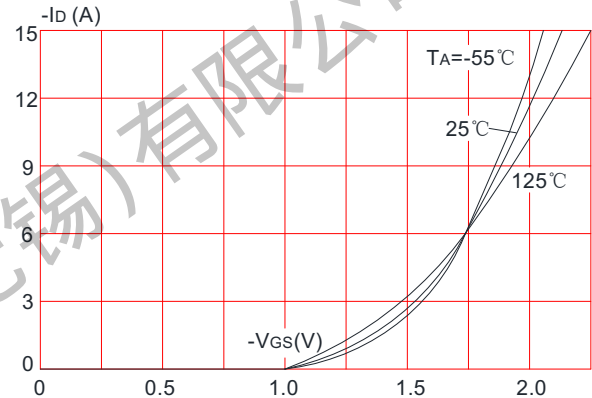


Figure 3: On-resistance vs. Drain Current

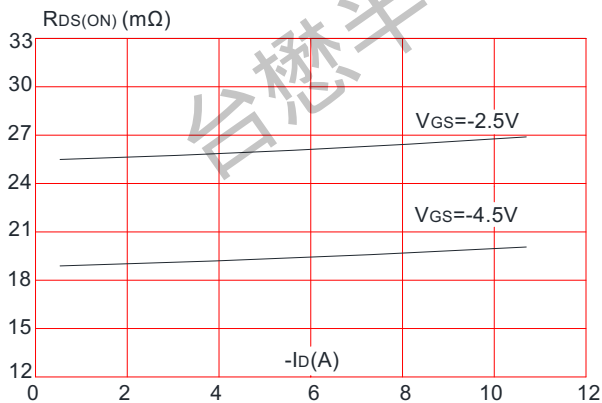


Figure 4: Body Diode Characteristics

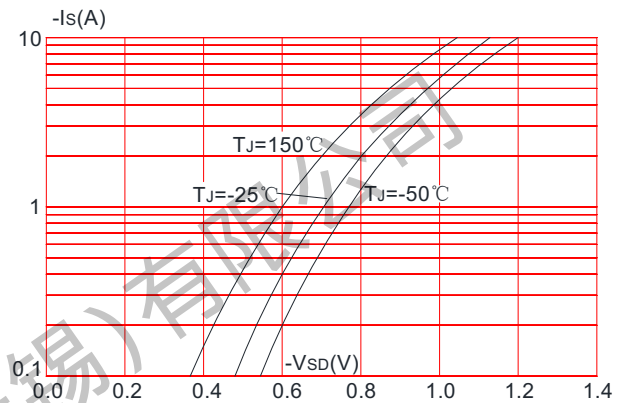


Figure 5: Gate Charge Characteristics

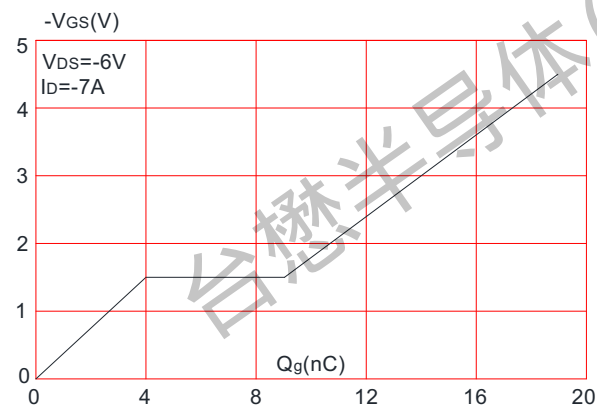
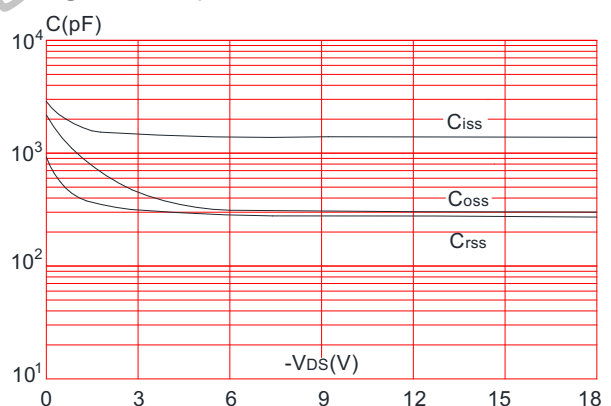


Figure 6: Capacitance Characteristics



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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

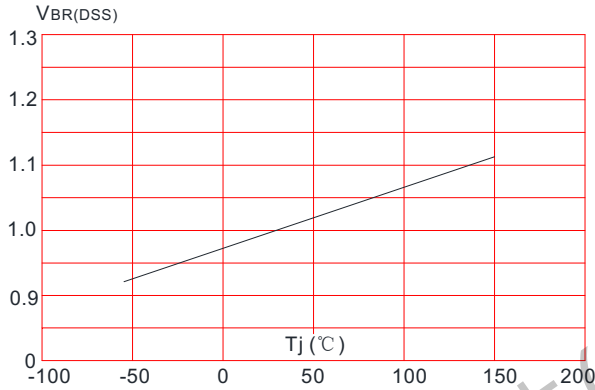


Figure 8: Normalized on Resistance vs. Junction Temperature

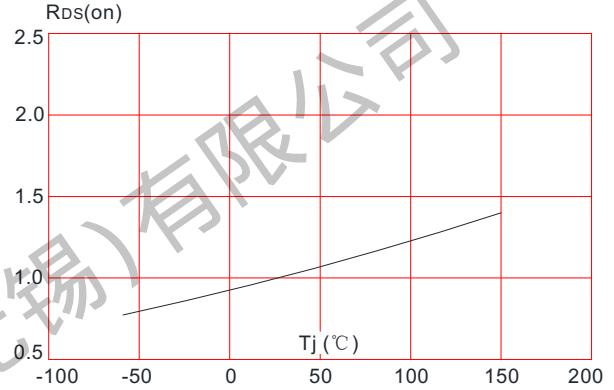


Figure 9: Maximum Safe Operating Area

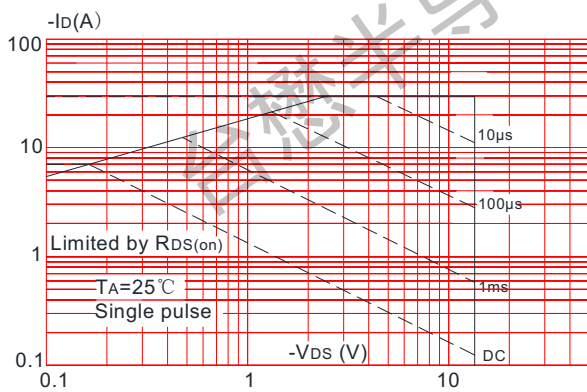


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

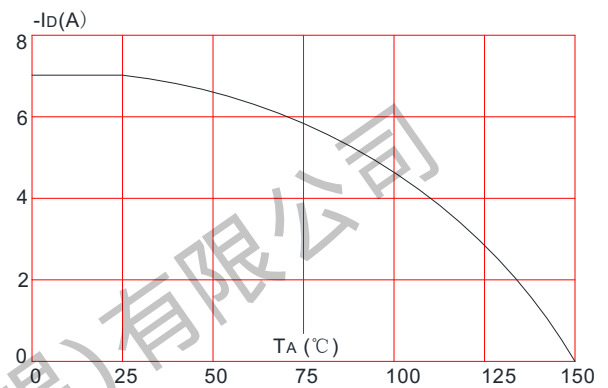
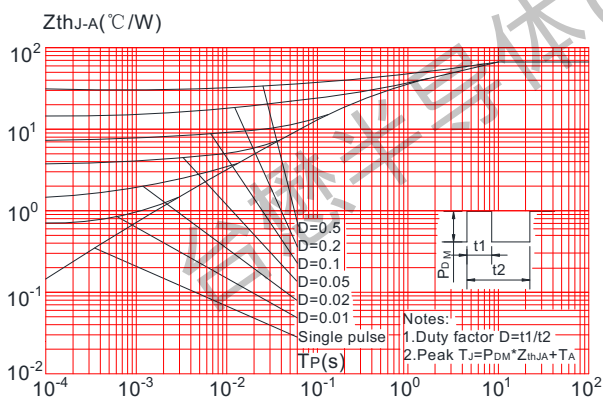


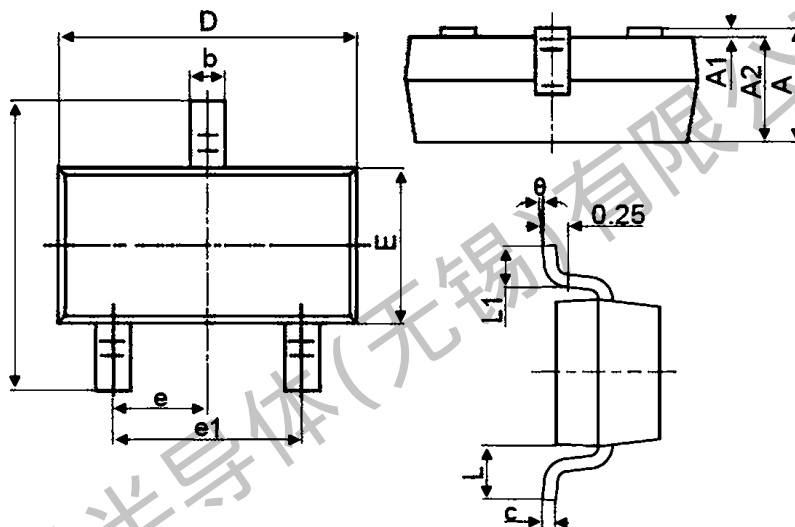
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



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Package Mechanical Data:SOT-23



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

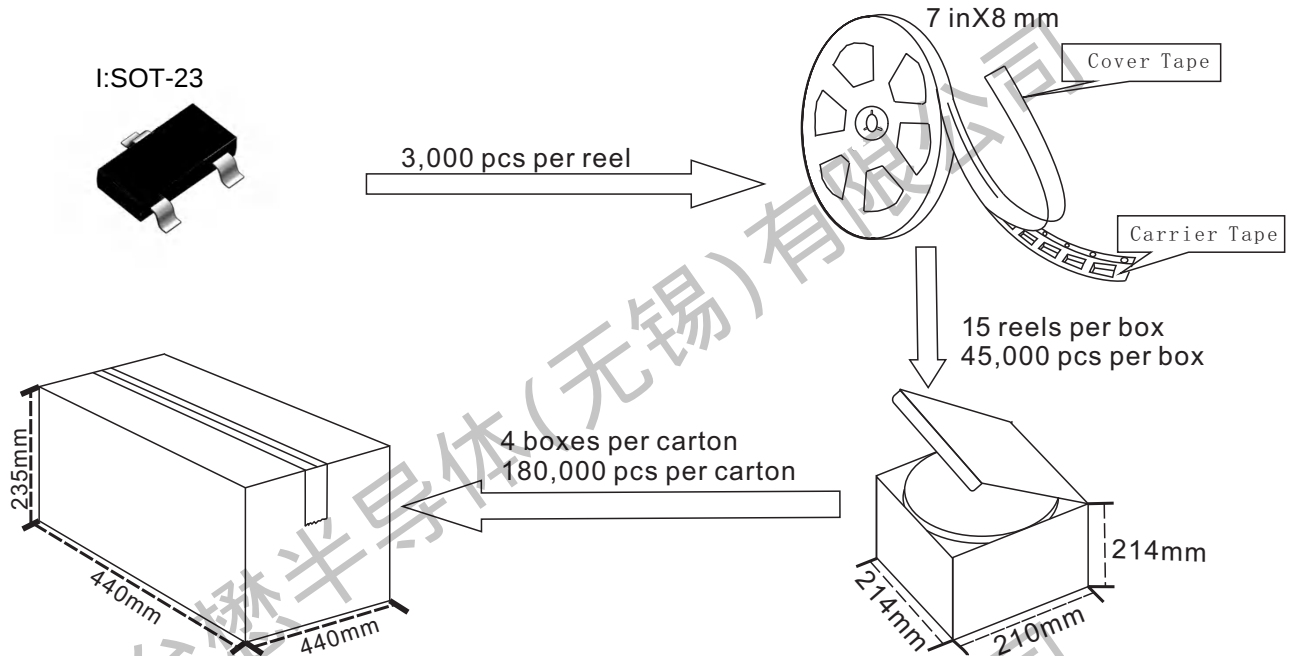


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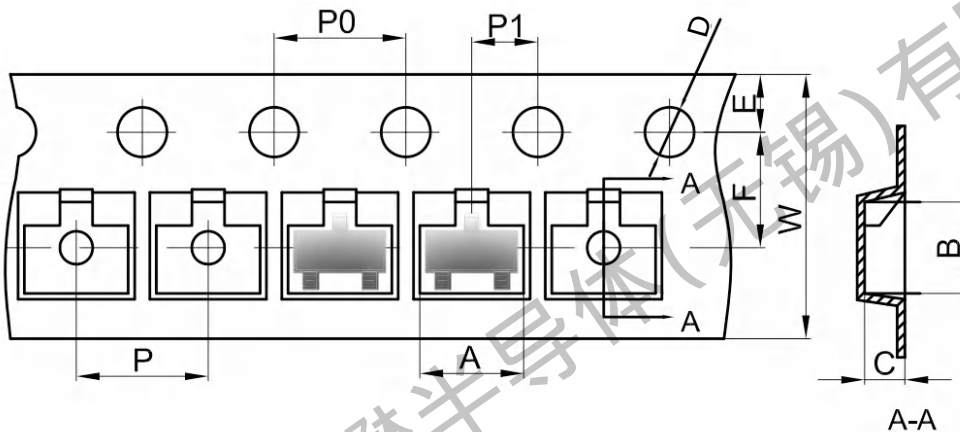
P-Channel Enhancement Mosfet

SOT-23 Packing

1. The method of packaging and dimension are shown as below figure. (Dimension in mm)



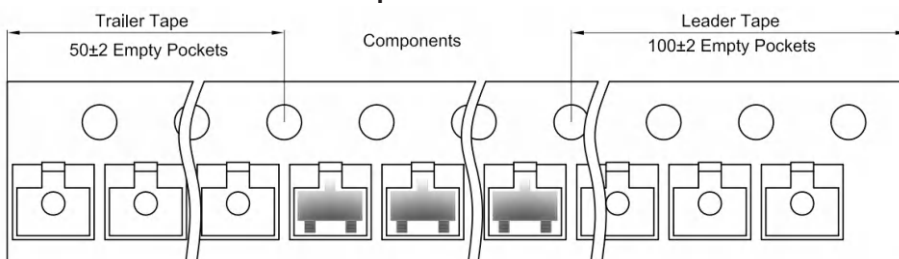
SOT-23 Embossed Carrier Tape



Dimensions are in millimeter

Pkg 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

SOT-23 Tape Leader and Trailer



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Revision history:

Date	Rev	Description	Page
2023.07.18	23.07	Original	