
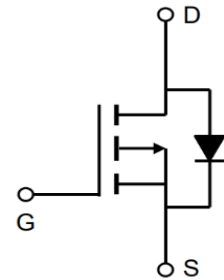
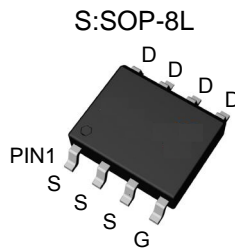
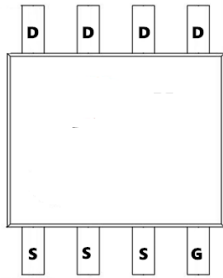


**TM08P04S**

**P-Channel Enhancement Mosfet**

<p><b>General Description</b></p> <ul style="list-style-type: none"> <li>• Low <math>R_{DS(ON)}</math></li> <li>• RoHS and Halogen-Free Compliant</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>• Load switch</li> <li>• PWM</li> </ul>	<p><b>General Features</b></p> <p><math>V_{DS} = -40V</math> <math>I_D = -7.5A</math>  <math>R_{DS(ON)} = 32 m\Omega @ V_{GS} = -10V</math></p> <p>100% UIS Tested                  100% <math>R_g</math> Tested</p> 
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Marking: 08P04 OR 040

**Absolute Maximum Ratings:** ( $T_C = 25^\circ C$  unless otherwise noted)

Symbol	Parameter	Ratings	Units
$V_{DS}$	Drain-Source Voltage	-40	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current- $T_C = 25^\circ C$	-7.5	A
	Continuous Drain Current- $T_C = 100^\circ C$	-5.7	
	Pulsed Drain Current <sup>1</sup>	-15	
$E_{AS}$	Single Pulse Avalanche Energy	36	mJ
$P_D$	Power Dissipation	3.1	W
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

**Thermal Characteristics:**

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	40	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	85	



## TM08P04S

## P-Channel Enhancement Mosfet

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	-40	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=-32V, T_J=25^\circ\text{C}$	---	---	-1	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	-1.0	---	-2.5	V
$R_{DS(on)}$	Drain-Source On Resistance <sup>2</sup>	$V_{GS}=-10V, I_D=-6A$	---	32	40	m $\Omega$
		$V_{GS}=-4.5V, I_D=-3A$	---	56	70	
$G_{FS}$	Forward Transconductance	$V_{DS}=-5V, I_D=-6A$	---	12	---	S
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	---	1004	---	pF
$C_{oss}$	Output Capacitance		---	108	---	
$C_{rss}$	Reverse Transfer Capacitance		---	80	---	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time <sup>2,3</sup>	$V_{DS}=-15V, V_{GS}=-10V$ $I_D=-1A, R_{GEN}=3.3\ \Omega$	---	19.2	---	ns
$t_r$	Rise Time <sup>2,3</sup>		---	12.8	---	ns
$t_{d(off)}$	Turn-Off Delay Time <sup>2,3</sup>		---	48.6	---	ns
$t_f$	Fall Time <sup>2,3</sup>		---	4.6	---	ns
$Q_g$	Total Gate Charge <sup>2,3</sup>	$V_{DS}=-20V, V_{GS}=-4.5V,$ $I_D=-6A$	---	9	---	nC
$Q_{gs}$	Gate-Source Charge <sup>2,3</sup>		---	2.54	---	nC
$Q_{gd}$	Gate-Drain "Miller" Charge <sup>2,3</sup>		---	3.1	---	nC
<b>Drain-Source Diode Characteristics</b>						
$V_{SD}$	Source-Drain Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1	V
$LS$	Continuous Source Current <sup>1, 5</sup>	$V_G=V_D=0V, \text{ Force Current}$	---	---	-7.5	
$LSM$	Pulsed Source Current <sup>2, 5</sup>		---	---	-15	

**Notes:** 1. Repetitive Rating : Pulsed width limited by maximum junction temperature.  
2. The data tested by pulsed , pulse width  $\leq 300\mu\text{s}$  , duty cycle  $\leq 2\%$ .  
3. Essentially independent of operating temperature.



Typical Characteristics: ( $T_c=25^\circ\text{C}$  unless otherwise noted)

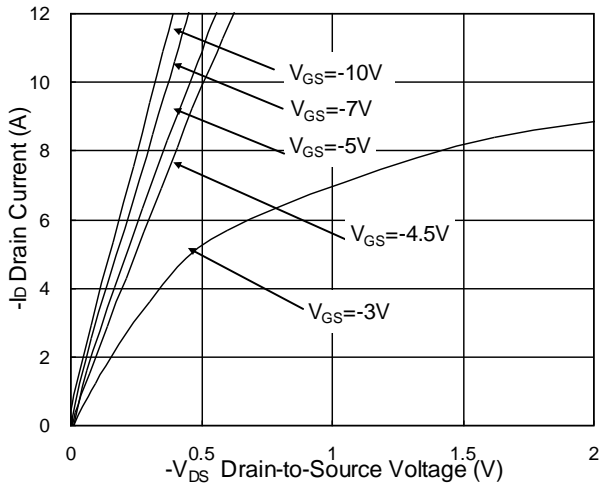


Fig.1 Typical Output Characteristics

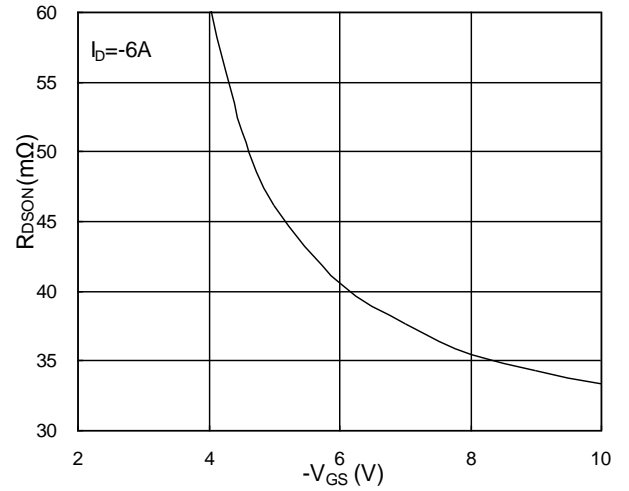


Fig.2 On-Resistance v.s Gate-Source

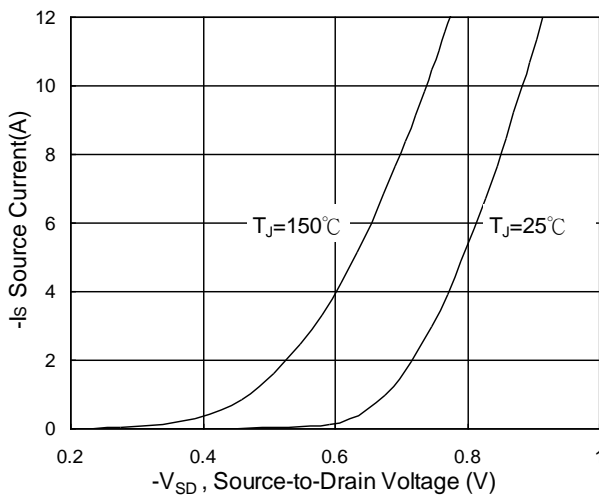


Fig.3 Forward Characteristics of Reverse

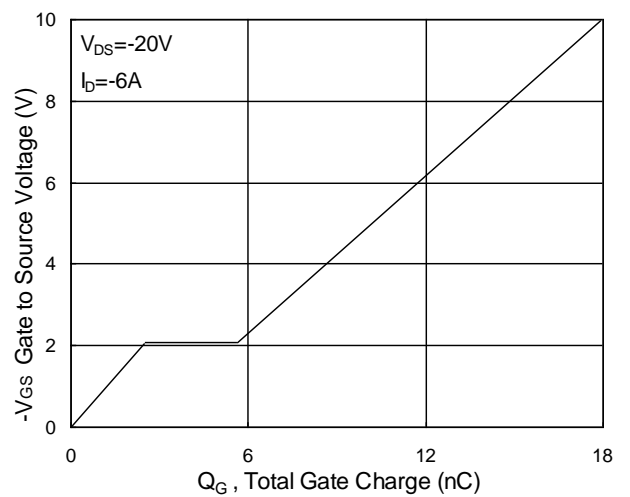


Fig.4 Gate-Charge Characteristics

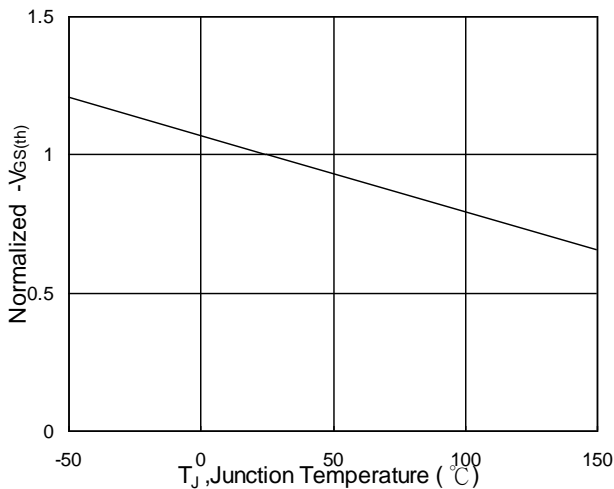


Fig.5 Normalized  $V_{GS(th)}$  v.s  $T_J$

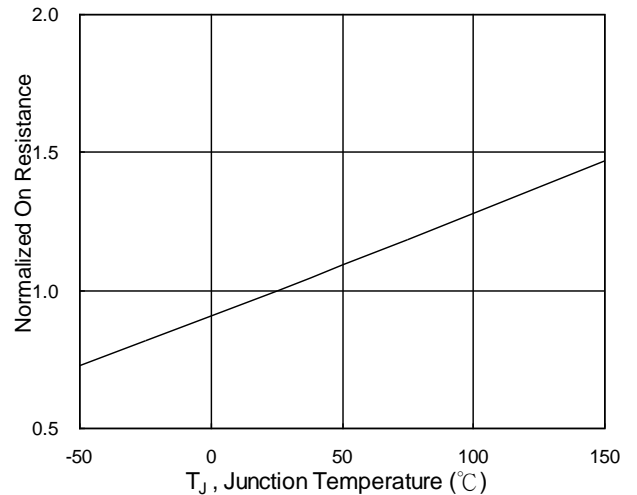


Fig.6 Normalized  $R_{DS(on)}$  v.s  $T_J$

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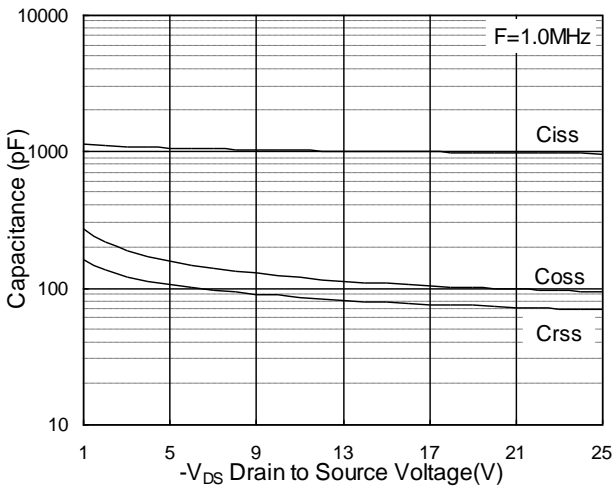


Fig.7 Capacitance

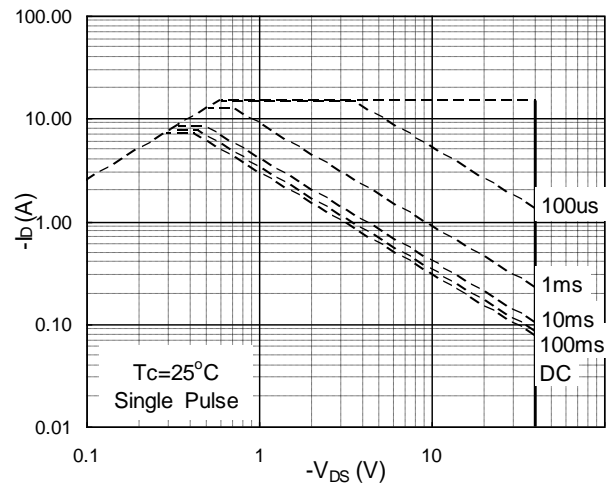


Fig.8 Safe Operating Area

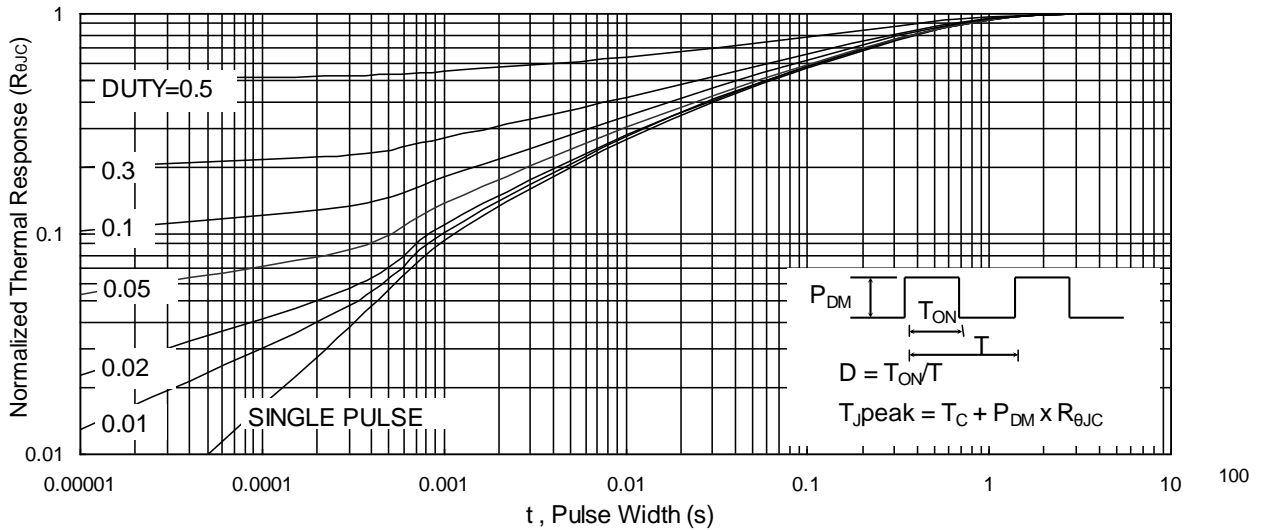


Fig.9 Normalized Maximum Transient Thermal Impedance

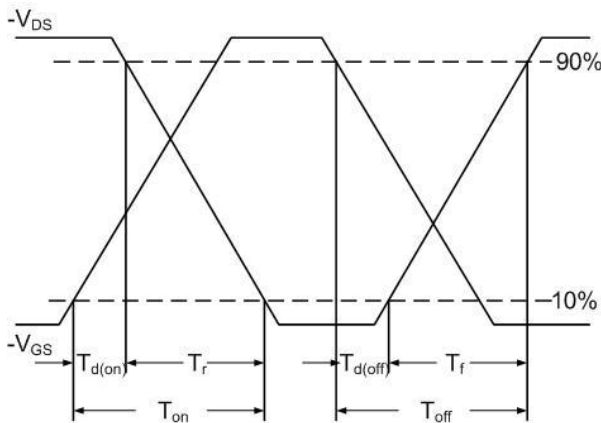


Fig.10 Switching Time Waveform

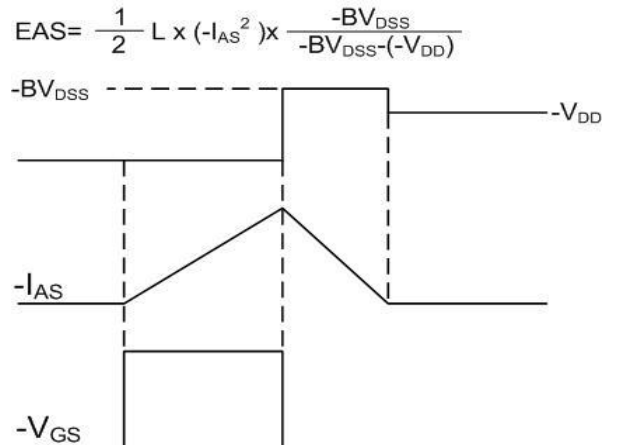
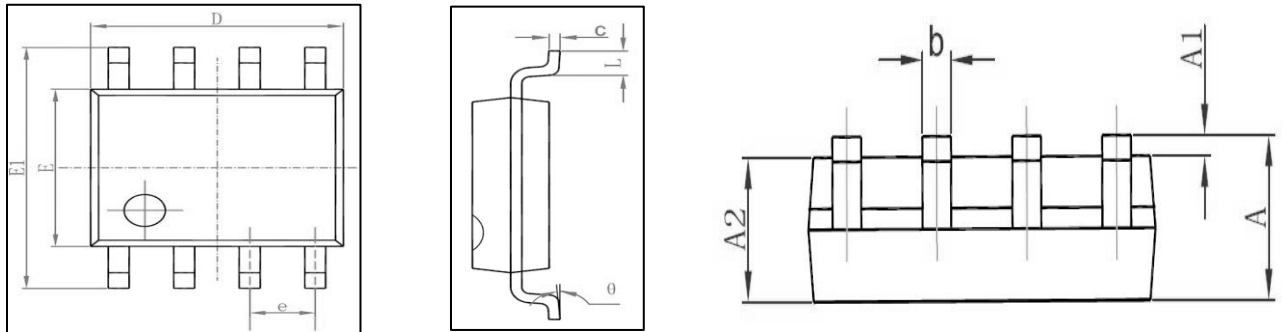
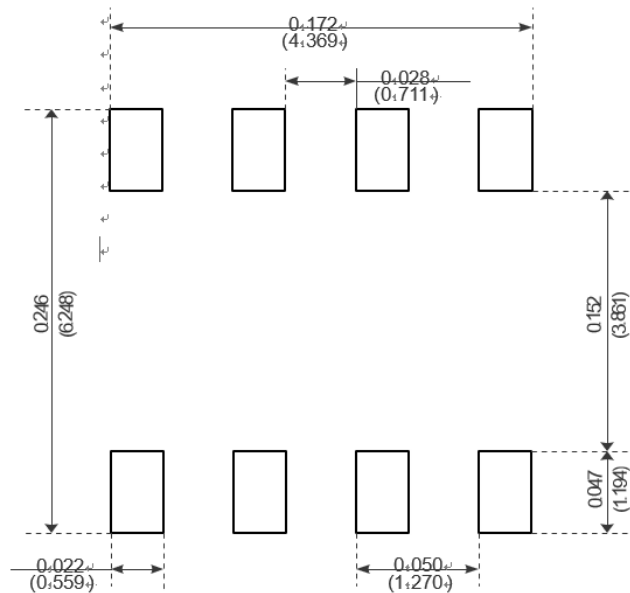


Fig.11 Unclamped Inductive Waveform

# Package Mechanical Data:SOP-8L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Recommended Minimum Pads