

**Features**

- Trench Power LV MOSFET Technology
- High Density Cell Design for Low  $R_{DS(on)}$
- High Speed Switching
- Halogen Free
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

**Maximum Ratings**

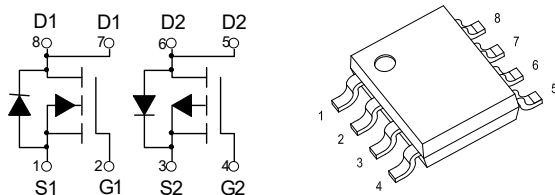
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 62.5°C/W Junction to Ambient

Parameter	Symbol	Rating	Unit
Total Power Dissipation	$P_D$	2	W
<b>N-Channel</b>			
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$I_D$	$T_A=25^\circ\text{C}$	5.6
		$T_A=70^\circ\text{C}$	4.5
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	23	A
<b>P-Channel</b>			
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$I_D$	$T_A=25^\circ\text{C}$	-4.4
		$T_A=70^\circ\text{C}$	-3.5
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	-27	A

Note:

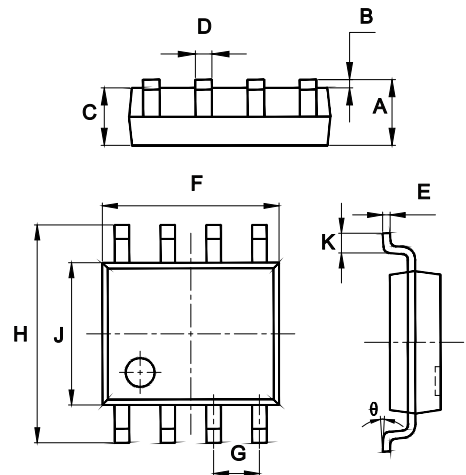
1. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

**Internal Structure:**



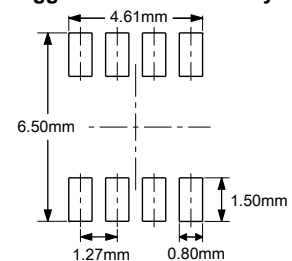
**Dual  
N&P-Channel  
MOSFET**

**SOP-8**



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.053	0.069	1.35	1.75	
B	0.004	0.010	0.10	0.25	
C	0.053	0.061	1.35	1.55	
D	0.013	0.020	0.33	0.51	
E	0.007	0.010	0.17	0.25	
F	0.185	0.200	4.70	5.10	
G	0.050		1.270		TYP.
H	0.228	0.244	5.80	6.20	
J	0.150	0.157	3.80	4.00	
K	0.016	0.050	0.40	1.27	
$\theta$	0°	8°	0°	8°	

**Suggested Solder Pad Layout**



**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

**N-Channel**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	30			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 12V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V$			1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.65	0.9	1.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5.6A$		19	25	m $\Omega$
		$V_{GS}=4.5V, I_D=5.0A$		22	31	
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V, f=1MHz$		535		pF
Output Capacitance	$C_{oss}$			130		
Reverse Transfer Capacitance	$C_{rss}$			36		
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS}=15V, V_{GS}=4.5V, I_D=5.6A$		4.8		nC
Gate-Source Charge	$Q_{gs}$			1.2		
Gate-Drain Charge	$Q_{gd}$			1.7		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=4.5V, V_{DS}=15V, I_D=1A, R_{GEN}=2.8\Omega$		12		ns
Turn-On Rise Time	$t_r$			52		
Turn-Off Delay Time	$t_{d(off)}$			17		
Turn-Off Fall Time	$t_f$			10		
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Body-Diode Continuous Current	$I_S$				5.6	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=5.6A$		0.8	1.2	V

**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**
**P-Channel**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 12V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-30V, V_{GS}=0V$			-1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.6	-0.9	-1.4	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-4.4A$		38	55	m $\Omega$
		$V_{GS}=-4.5V, I_D=-4A$		45	66	
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-15V, V_{GS}=0V, f=1MHz$		680		pF
Output Capacitance	$C_{oss}$			105		
Reverse Transfer Capacitance	$C_{rss}$			68		
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS}=-15V, V_{GS}=-10V, I_D=-4.4A$		7.2		nC
Gate-Source Charge	$Q_{gs}$			1.2		
Gate-Drain Charge	$Q_{gd}$			1.6		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=-10V, V_{DS}=-15V, I_D=-1A,$ $R_{GEN}=2.5\Omega, R_L=15\Omega$		15		ns
Turn-On Rise Time	$t_r$			63		
Turn-Off Delay Time	$t_{d(off)}$			21		
Turn-Off Fall Time	$t_f$			12		
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Body-Diode Continuous Current	$I_S$				-4.4	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-4.4A$		-0.8	-1.2	V

**Curve Characteristics**  
**N-Channel**

Fig. 1 - Typical Output Characteristics

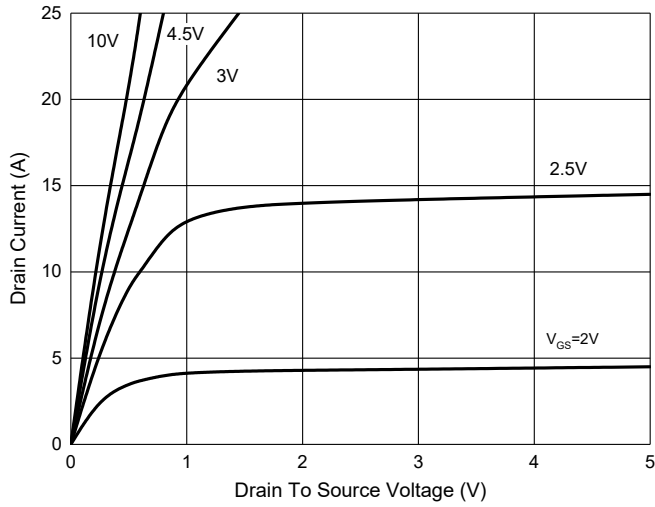


Fig. 2 - Transfer Characteristics

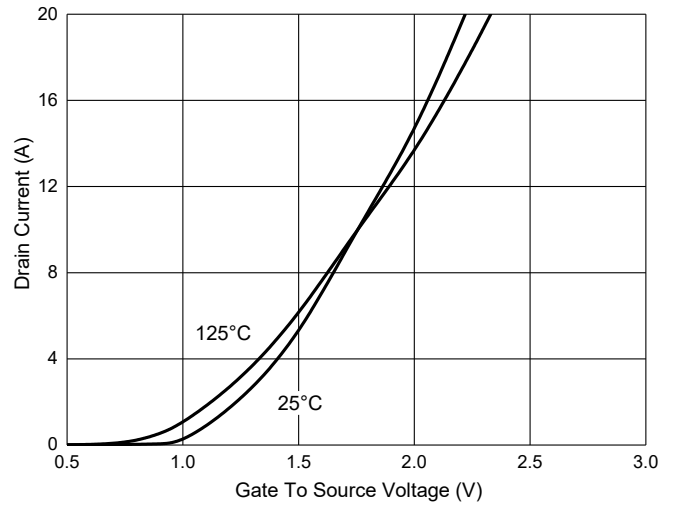


Fig. 3 -  $R_{DS(ON)} - I_D$

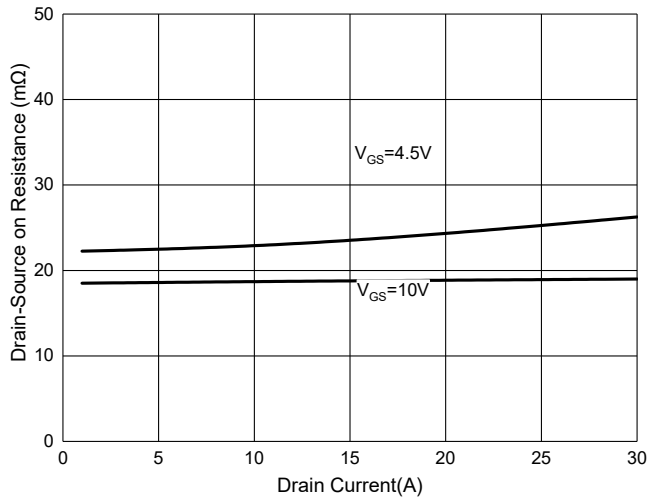


Fig. 4 - Normalized On Resistance Characteristics

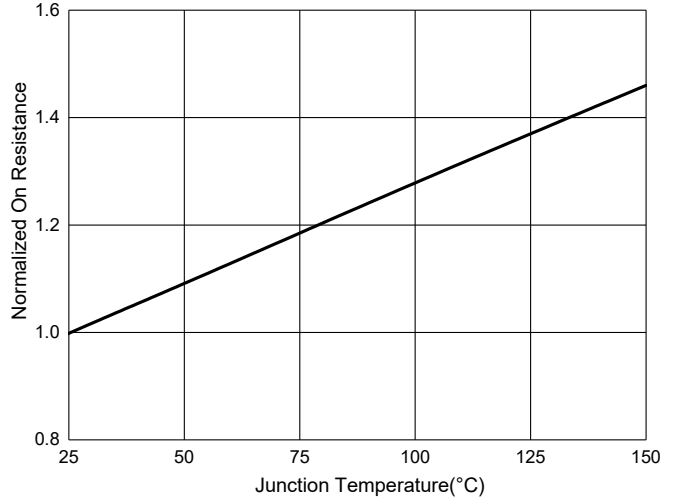


Fig. 5 - Capacitance Characteristics

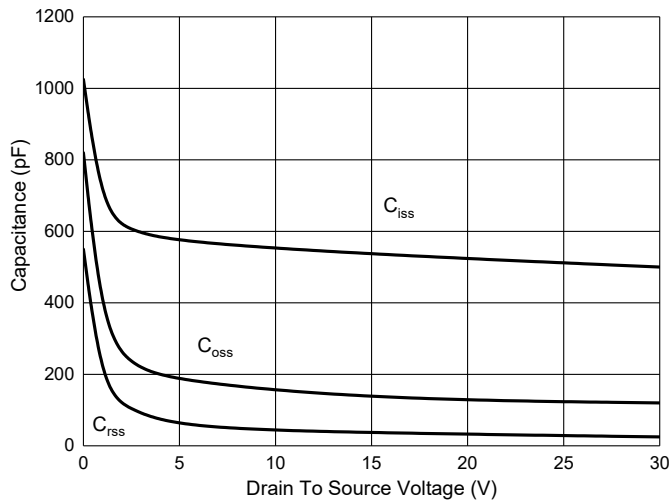
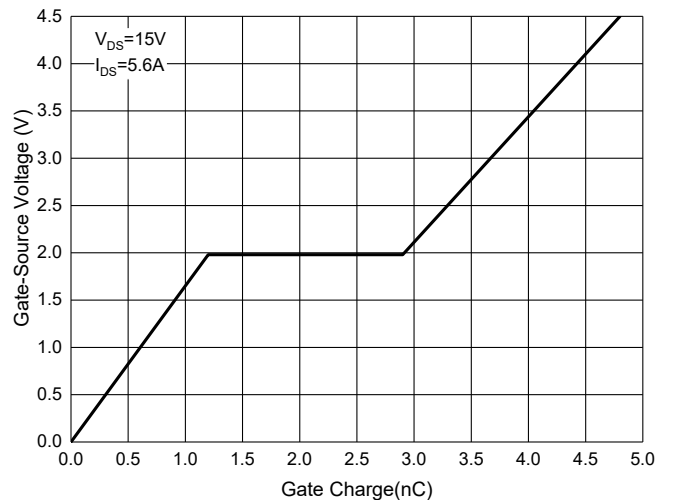


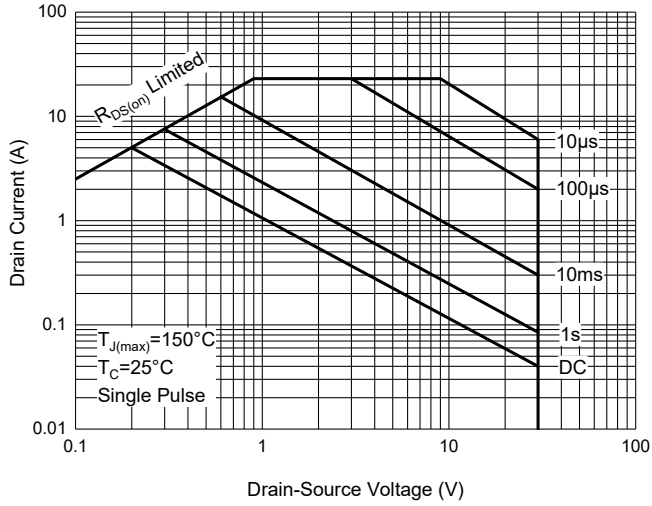
Fig. 6 - Gate Charge



## Curve Characteristics

### N-Channel

Fig. 7 - Safe Operation Area



### P-Channel

Fig. 8 - Typical Output Characteristics

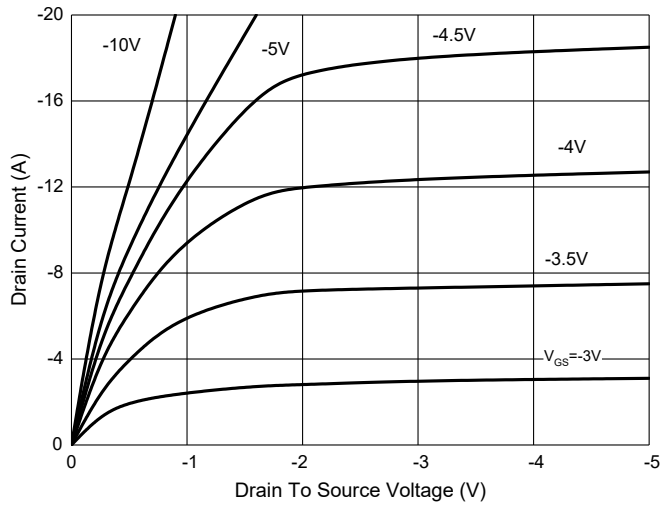


Fig. 9 - Transfer Characteristics

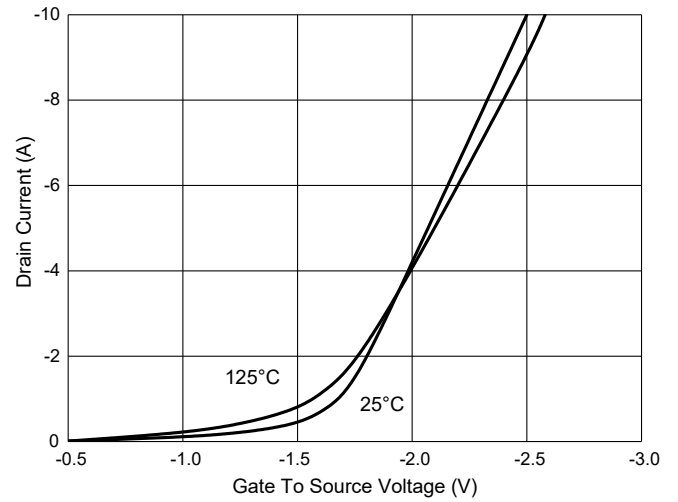


Fig. 10 -  $R_{DS(ON)} - I_D$

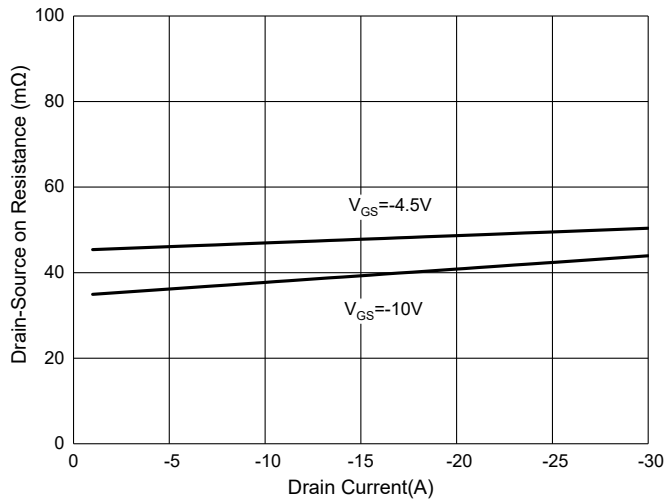
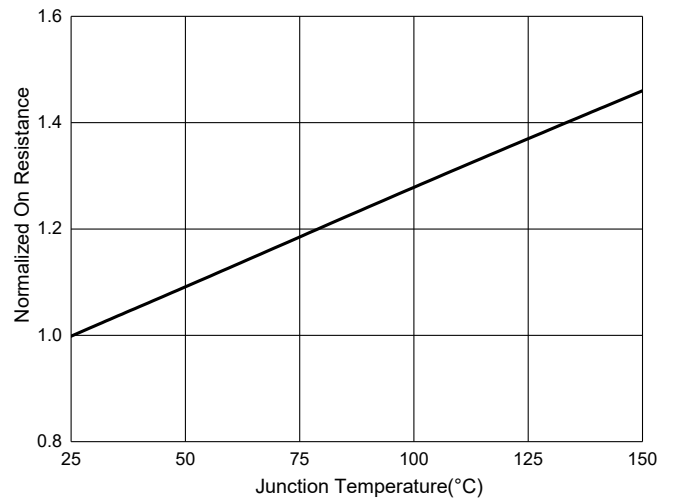


Fig. 11 - Normalized On Resistance Characteristics



**Curve Characteristics**  
**P-Channel**

Fig. 12 - Capacitance Characteristics

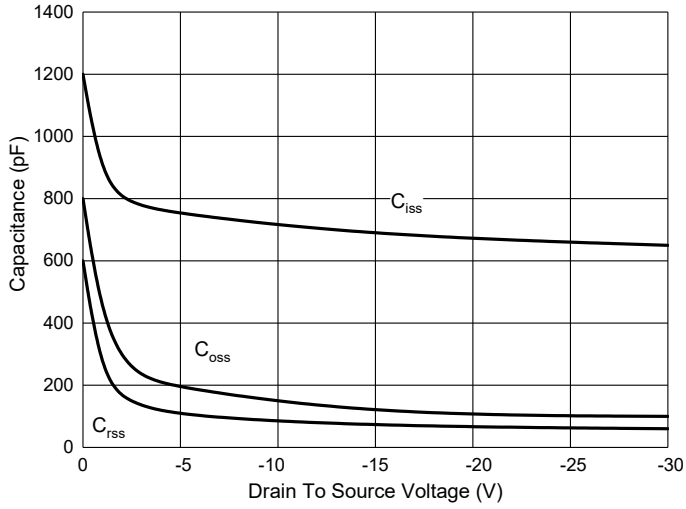


Fig. 13 - Gate Charge

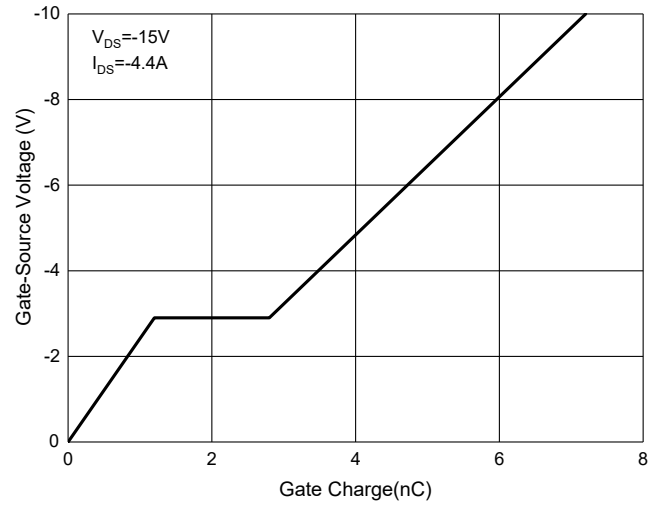
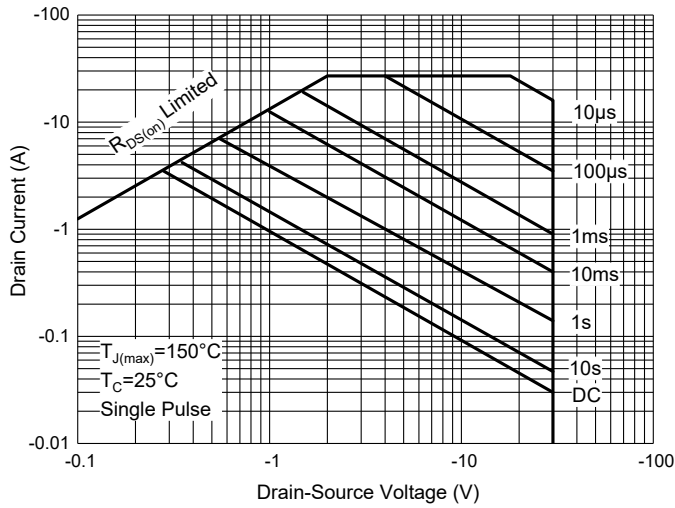


Fig. 14 - Safe Operation Area



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 4Kpcs/Reel

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