

## Features

- Trench Power LV MOSFET Technology
- High Speed Switching
- High Density Cell Design for Low  $R_{DS(on)}$
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## P-CHANNEL MOSFET

## Maximum Ratings

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 39°C/W Junction to Ambient<sup>(Note 1)</sup>

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 25$	V
Continuous Drain Current <small><math>T_A=25^\circ\text{C}</math></small>	$I_D$	-12	A
		-10	A
Pulsed Drain Current <sup>(Note 2)</sup>	$I_{DM}$	-55	A
Single Pulse Avalanche Energy <sup>(Note 3)</sup>	$E_{AS}$	105	mJ
Total Power Dissipation <sup>(Note 4)</sup>	$P_D$	3.2	W

### Note:

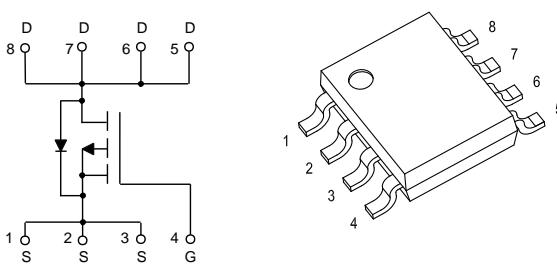
1. The Value of  $R_{\theta JA}$  is Measured with the Device Mounted on 1in<sup>2</sup> FR-4 Board with 2oz. Copper, in a Still Air Environment with  $T_A=25^\circ\text{C}$ . The Value in Any Given Application Depends on the User's Specific Board Design.

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

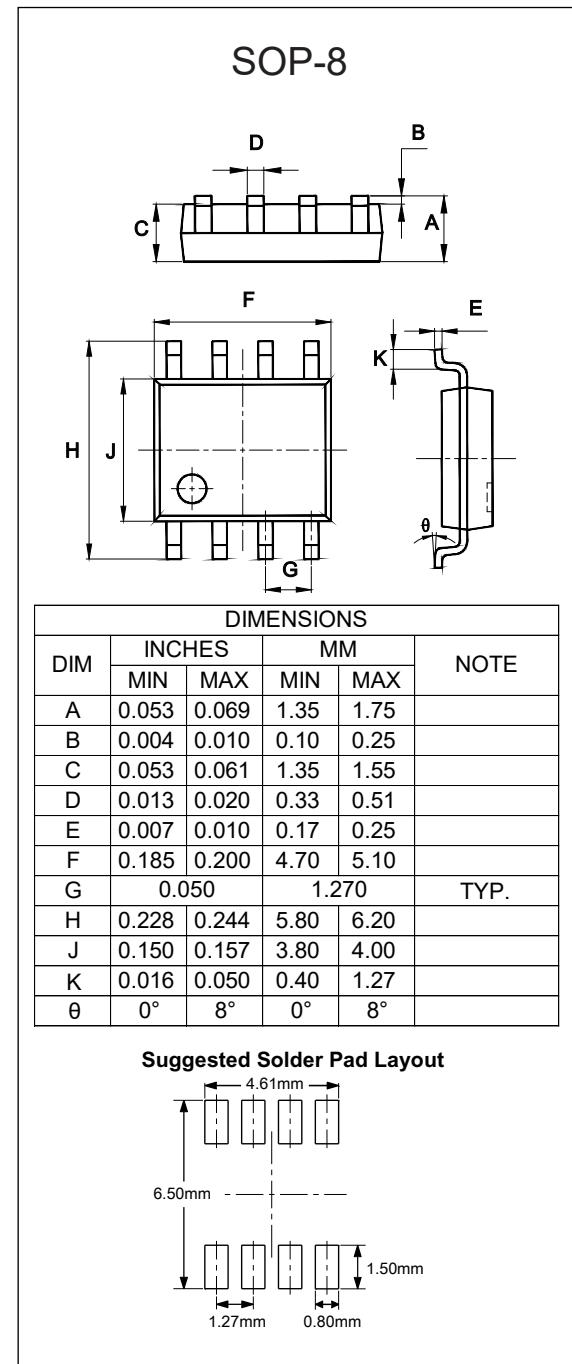
3. Repetitive Rating, Pulse Width Limited by Junction Temperature  $T_{J(\text{MAX})}=150^\circ\text{C}$ . Ratings are Based on Low Frequency and Duty Cycles to Keep Initial  $T_J=25^\circ\text{C}$ .

4. The Power Dissipation  $P_D$  is Based on  $T_{J(\text{MAX})}=150^\circ\text{C}$ , Using  $\leq 10\text{s}$  Junction-to-Ambient Thermal Resistance.

## Internal Structure



Marking:Q4407B



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

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	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 25V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-30V, V_{GS}=0V$			-1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.2	-1.8	-2.8	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-20V, I_D=-12A$		9	10.5	$m\Omega$
		$V_{GS}=-10V, I_D=-12A$		10.2	12.5	
		$V_{GS}=-6V, I_D=-10A$		12.3	16.5	
		$V_{GS}=-4.5V, I_D=-10A$		16	25	
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-12A$		-0.8	-1.2	V
Continuous Body Diode Current	$I_S$				-12	A
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-15V, V_{GS}=0V, f=1MHz$		2050		$pF$
Output Capacitance	$C_{oss}$			355		
Reverse Transfer Capacitance	$C_{rss}$			301		
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS}=-15V, V_{GS}=-10V, I_D=-12A$		29.8		$nC$
Gate-Source Charge	$Q_{gs}$			4.7		
Gate-Drain Charge	$Q_{gd}$			10		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=-10V, V_{DD}=-15V, I_D=-1A, R_{GEN}=2.5\Omega$		14		$ns$
Turn-On Rise Time	$t_r$			12		
Turn-Off Delay Time	$t_{d(off)}$			26		
Turn-Off Fall Time	$t_f$			10		

## Curve Characteristics

Fig. 1 - Typical Output Characteristics

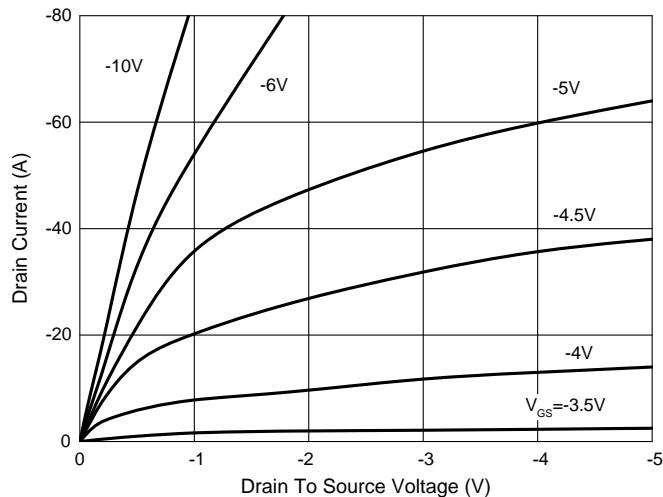


Fig. 2 - Transfer Characteristics

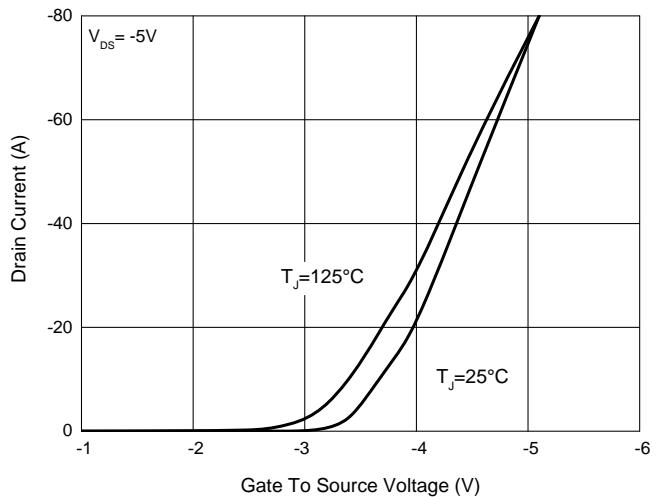


Fig. 3 - Capacitance Characteristics

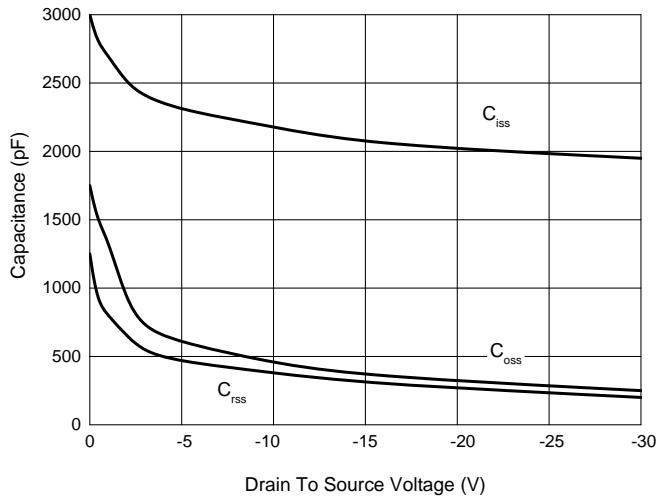


Fig. 4 -  $R_{DS(ON)} - I_D$

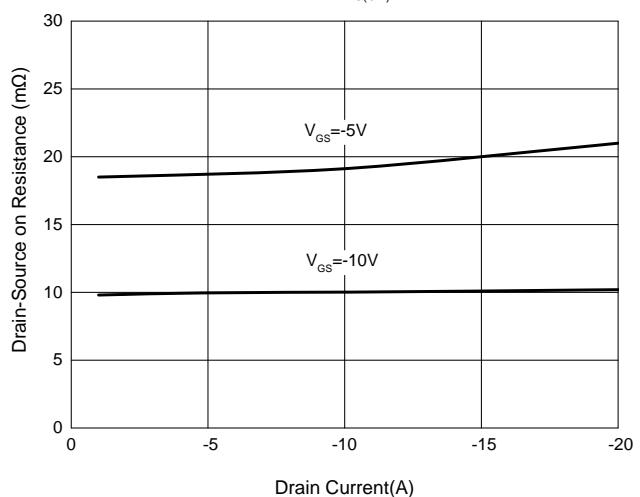


Fig. 5 - Total Gate Charge Characteristics

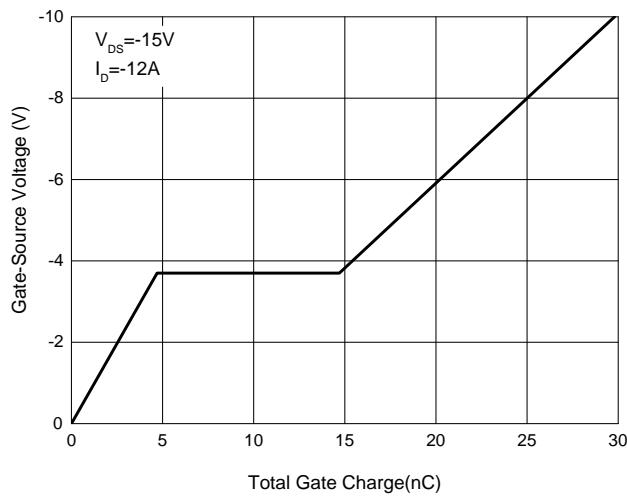
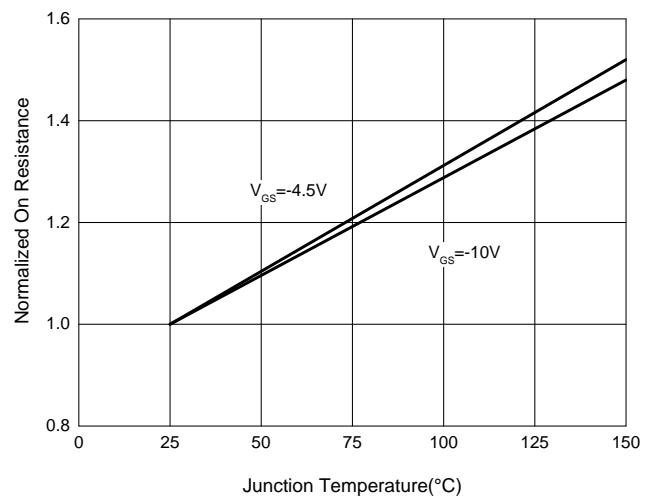


Fig. 6 - Normalized On Resistance Characteristics



## Ordering Information

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

Note : Adding "-HF" Suffix for Halogen Free, eg. Part Number-TP-HF

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