

**Features**

- Trench Power LV MOSFET Technology
- Excellent Package for Heat Dissipation
- 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)

**Maximum Ratings**

- Operating Junction Temperature Range : -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Thermal Resistance: 5°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	$T_C=25^\circ\text{C}$	50
		$T_C=100^\circ\text{C}$	35
Pulsed Drain Current <sup>(Note 2)</sup>	$I_{DM}$	190	A
Single Pulse Avalanche Energy <sup>(Note 3)</sup>	$E_{AS}$	225	mJ
Total Power Dissipation	$P_D$	$T_C=25^\circ\text{C}$	30
		$T_C=100^\circ\text{C}$	15

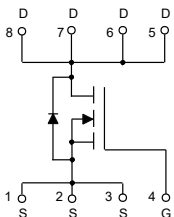
Note:

1.  $R_{\theta JA}$  is the Sum of the Junction-to-Case and Case-to-Ambient Thermal Resistance, Where the Case Thermal Reference is Defined as The Solder Mounting Surface of the Drain Pins.  $R_{\theta JC}$  is Guaranteed by Design, While  $R_{\theta JA}$  is Determined by the Board Design. The Maximum Rating Presented Here is Based on Mounting on a 1 in<sup>2</sup> pad of 2oz Copper.

2. Pulse Test; Pulse Width ≤ 300µs, Duty Cycle ≤ 2%.

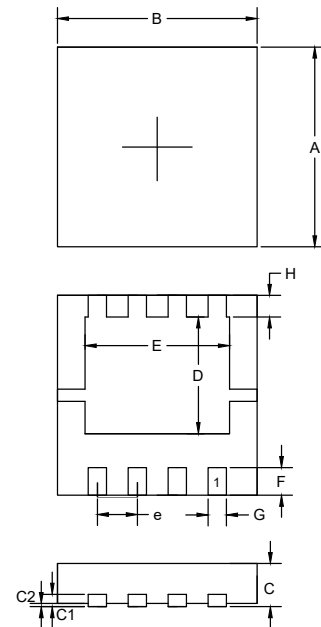
3.  $T_J=25^\circ\text{C}$ ,  $V_{DS}=30\text{V}$ ,  $V_{DD}=25\text{V}$ ,  $V_{GS}=10\text{V}$ ,  $L=1\text{mH}$ .

**Internal Structure**



**N-CHANNEL MOSFET**

**DFN3333**



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.126	0.130	3.20	3.30	
B	0.126	0.130	3.20	3.30	
C	0.030	0.033	0.75	0.85	
C1	0.007	0.009	0.18	0.22	
C2	---	0.002	---	0.05	
D	0.071	0.079	1.80	2.00	
E	0.087	0.098	2.20	2.50	
F	0.016	0.020	0.40	0.50	
G	0.010	0.014	0.25	0.35	
H	0.012	0.016	0.30	0.40	
e	0.024	0.028	0.60	0.70	

**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	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	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	1.5	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=15A$		4.9	6	m $\Omega$
		$V_{GS}=4.5V, I_D=15A$		6.3	8	
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=20A$			1.2	V
Continuous Body Diode Current	$I_S$				50	A
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V, f=1MHz$		2150		pF
Output Capacitance	$C_{oss}$			435		
Reverse Transfer Capacitance	$C_{rss}$			252		
Total Gate Charge	$Q_g$	$V_{DS}=15V, V_{GS}=10V, I_D=20A$		52.8		nC
Gate-Source Charge	$Q_{gs}$			12.3		
Gate-Drain Charge	$Q_{gd}$			10.8		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DD}=20V, I_D=4A, R_L=1\Omega$ $R_{GEN}=3\Omega$		9		ns
Turn-On Rise Time	$t_r$			15.5		
Turn-Off Delay Time	$t_{d(off)}$			29		
Turn-Off Fall Time	$t_f$			9		
Gate-Source Leakage Current	$I_{GSS}$	$I_F=25A, di/dt=100A/\mu s$		28		nC
Zero Gate Voltage Drain Current	$I_{DSS}$				27	

**Curve Characteristics**

Fig. 1 - Output Characteristics

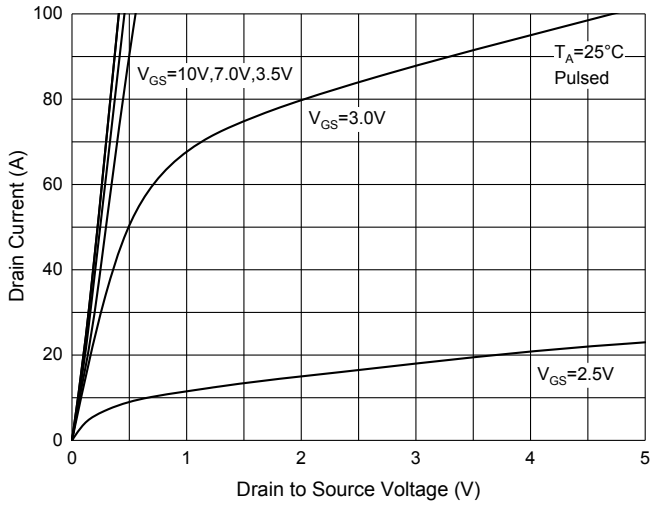


Fig. 2 - Transfer Characteristics

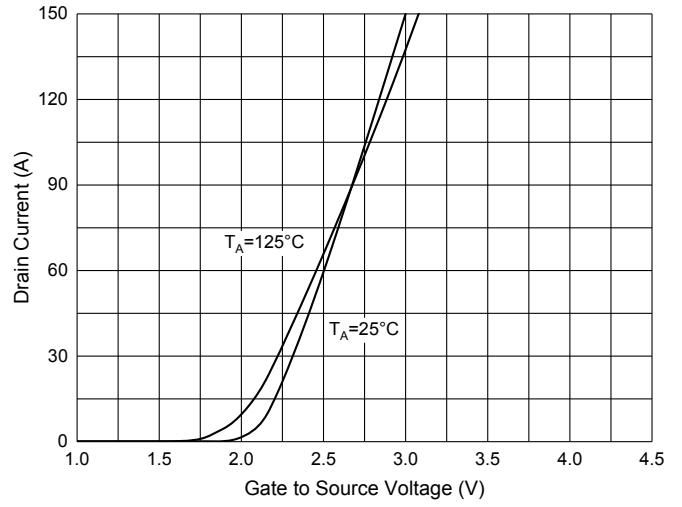


Fig. 3 - Capacitance Characteristics

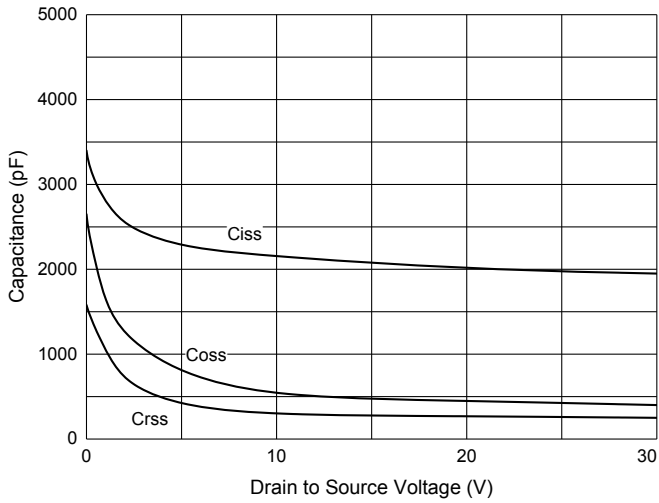


Fig. 4 - Gate Charge

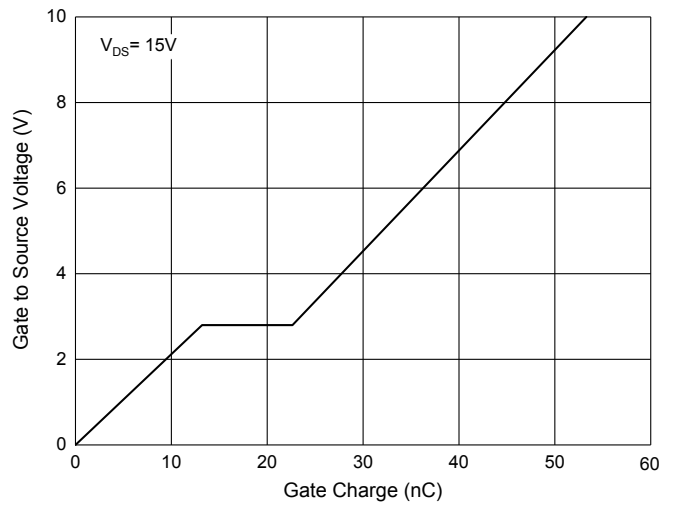


Fig. 5 -  $R_{DS(ON)} - I_D$

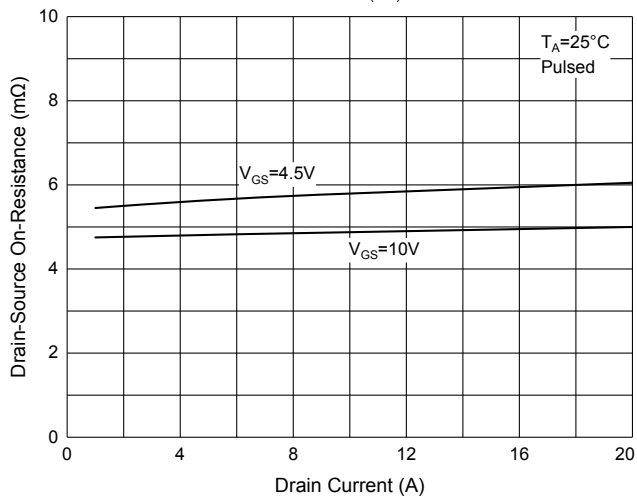
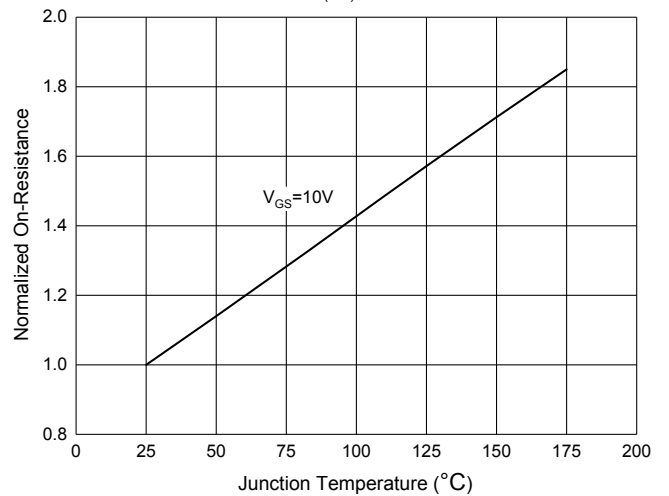


Fig. 6 -  $R_{DS(ON)} - \text{Temperature}$



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 5Kpcs/Reel

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

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