

## Features

- Split Gate Trench MOSFET Technology
- Low  $R_{DS(on)}$  & FOM
- Extremely Low Switching Loss
- Fast Switching and Soft Recovery
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

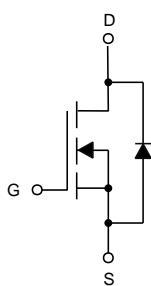
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 1.7°C/W Junction to Case (Steady-State)
- Thermal Resistance: 20°C/W Junction to Ambient ( $t \leq 10s$ )<sup>(1)</sup>
- Thermal Resistance: 50°C/W Junction to Ambient (Steady-State)<sup>(1)</sup>

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	45	A
Pulsed Drain Current <sup>(2)</sup>	$I_{DM}$	180	A
Total Power Dissipation <sup>(3)</sup>	$P_D$	72	W
Single Pulsed Avalanche Energy <sup>(4)</sup>	$E_{AS}$	81	mJ

Note:

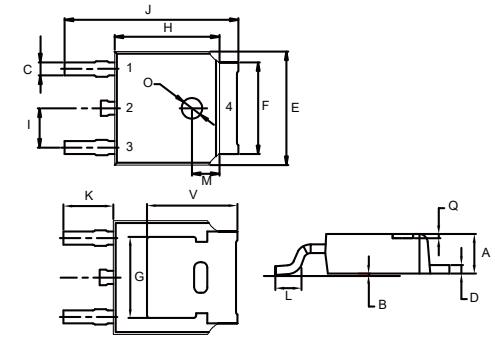
1. The value of  $R_{QJA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ C$ . The Power dissipation  $P_{DSM}$  is based on  $R_{QJA}$   $t \leq 10s$  and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
2. Repetitive rating; pulse width limited by max. junction temperature.
3.  $P_D$  is based on max. junction temperature, using junction-case thermal resistance.
4.  $V_{DD}=50V$ ,  $R_G=25\Omega$ ,  $L=0.5mH$ ,  $I_{AS}=25A$ .

## Internal Structure



## N-CHANNEL MOSFET

### DPAK(TO-252)



1. Gate  
2,4. Drain  
3. Source

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.087	0.094	2.20	2.40	
B	0.000	0.005	0.00	0.13	
C	0.026	0.034	0.66	0.86	
D	0.018	0.023	0.46	0.58	
E	0.256	0.264	6.50	6.70	
F	0.201	0.215	5.10	5.46	
G	0.190		4.83		TYP.
H	0.236	0.244	6.00	6.20	
I	0.086	0.094	2.18	2.39	
J	0.386	0.409	9.80	10.40	
K	0.114		2.90		TYP.
L	0.055	0.067	1.40	1.70	
M	0.063		1.60		TYP.
O	0.043	0.051	1.10	1.30	
Q	0.000	0.012	0.00	0.30	
V	0.211		5.35		TYP.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=100V, V_{GS}=0V$			1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.8	3	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		14	17	$m\Omega$
		$V_{GS}=4.5V, I_D=20A$		17	21.5	$m\Omega$
Gate Resistance	$R_g$	$f=1MHz, Open drain$		1		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				40	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=20A$			1.3	V
Reverse Recovery Time	$t_{rr}$	$I_S=20A, dI_F/dt=100A/\mu s$		39.8		ns
Reverse Recovery Charge	$Q_{rr}$			42		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=50V, V_{GS}=0V, f=1MHz$		1135		pF
Output Capacitance	$C_{oss}$			399		
Reverse Transfer Capacitance	$C_{rss}$			18		
Total Gate Charge	$Q_g$	$V_{DS}=50V, V_{GS}=10V, I_D=25A$		16		nC
Gate-Source Charge	$Q_{gs}$			5.6		
Gate-Drain Charge	$Q_{gd}$			2.4		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DD}=50V, I_D=25A$ $R_{GEN}=2.2\Omega$		39.2		ns
Turn-On Rise Time	$t_r$			11		
Turn-Off Delay Time	$t_{d(off)}$			53.2		
Turn-Off Fall Time	$t_f$			15.8		

## Curve Characteristics

Fig. 1 - Typical Output Characteristics

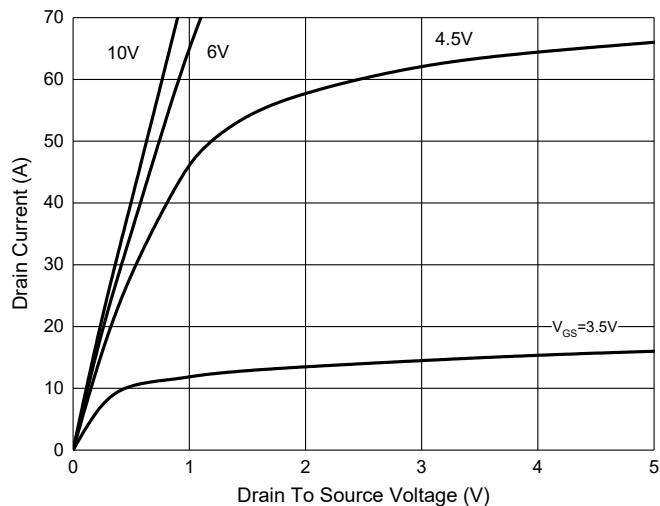


Fig. 2 - Transfer Characteristics

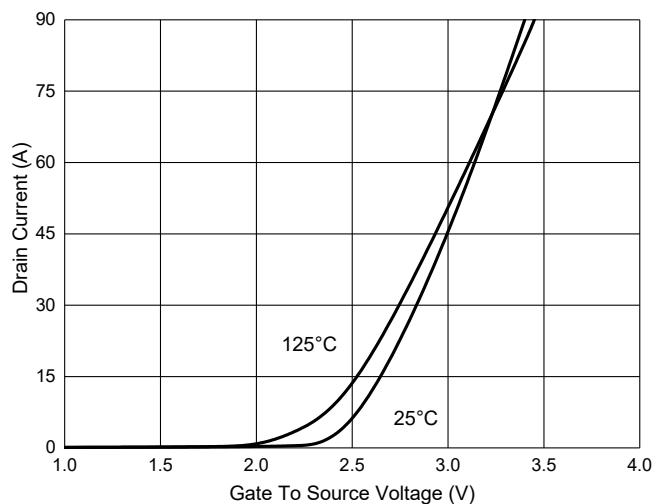


Fig. 3 -  $R_{DS(ON)} - I_D$

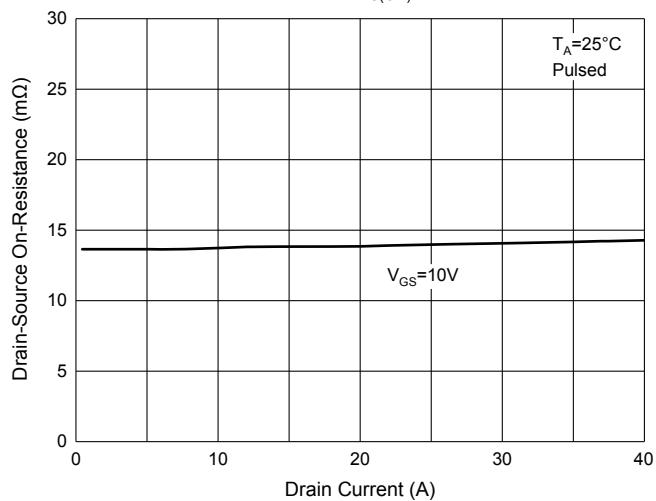


Fig. 4 - Normalized On Resistance Characteristics

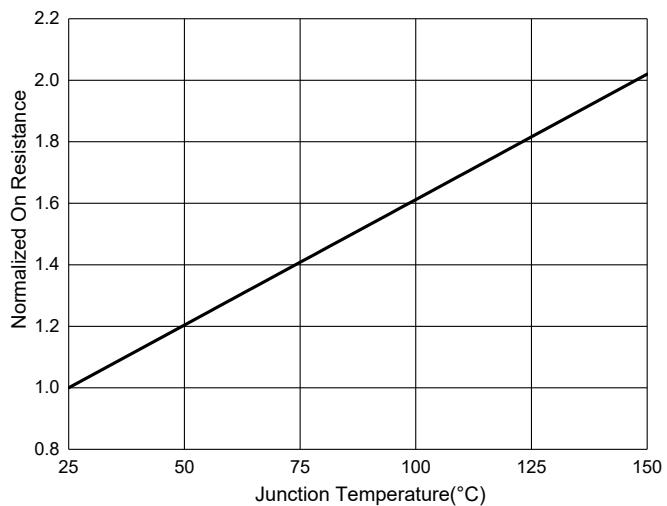


Fig. 5 - Capacitance Characteristics

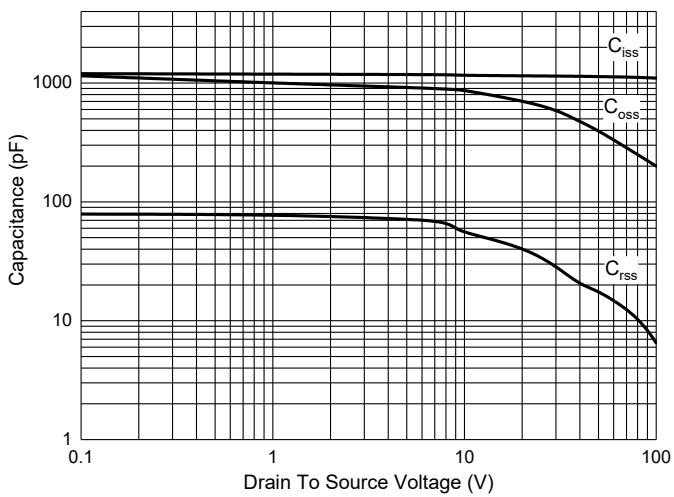
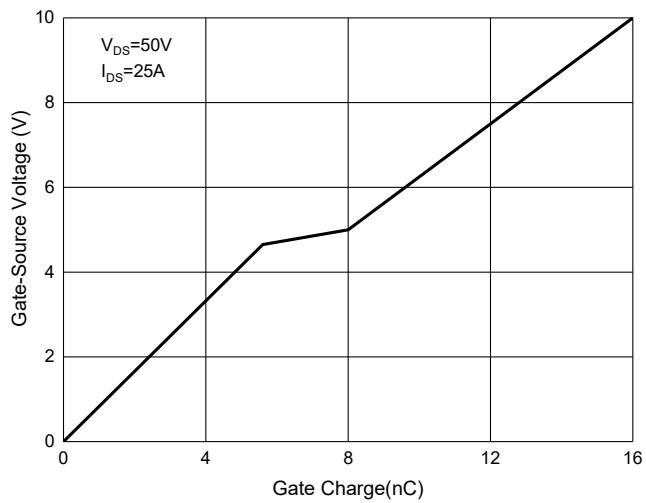
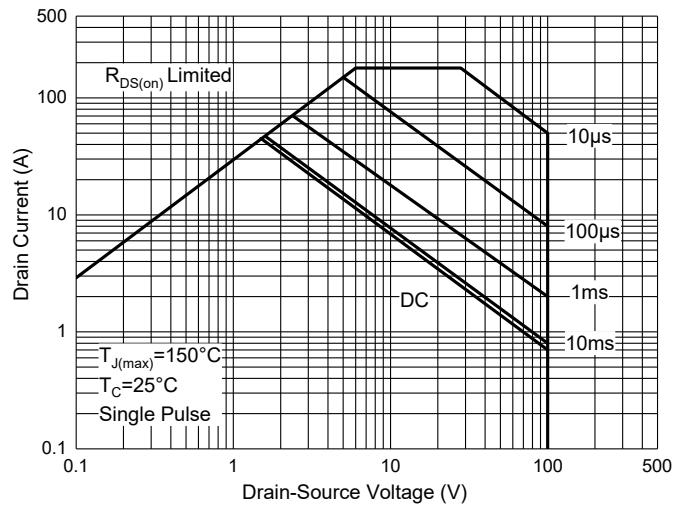


Fig. 6 - Gate Charge



## Curve Characteristics

Fig. 7 - Safe Operation Area



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 2.5Kpcs/Reel

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

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