

Features

- High Density Cell Design for Low $R_{DS(on)}$
- Trench Power LV MOSFET Technology
- 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)

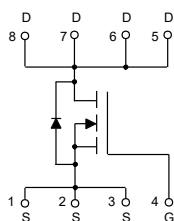
Maximum Ratings

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 53.4°C/W Junction to Ambient
- Thermal Resistance: 5.9°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	20	A
		14	
Pulsed Drain Current	I_{DM}	90	A
Total Power Dissipation	P_D	21	W
		2.34	
Single Pulsed Avalanche Energy ^(Note1)	E_{AS}	70	mJ

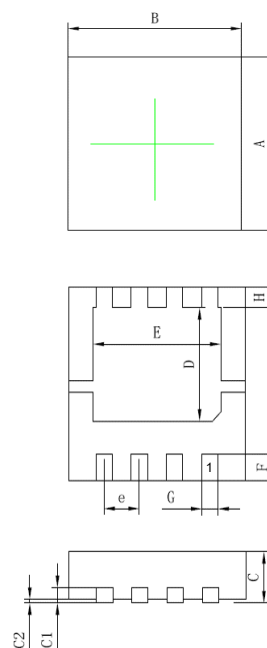
Note 1. $T_J=25^\circ\text{C}$, $V_{DD}=20\text{V}$, $V_G=10\text{V}$, $L=0.5\text{mH}$, $R_g=25\Omega$.

Internal Structure



N-CHANNEL MOSFET

DFN3333



DIMENSIONS					
DIM	INCHES		MM		NOTE
	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
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	40			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V			1	μA
Gate-Threshold Voltage ^(Note 2)	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.5	2.5	V
Drain-Source On-Resistance ^(Note 2)	R _{DS(on)}	V _{GS} =10V, I _D =20A		11	14	mΩ
		V _{GS} =4.5V, I _D =10A		14.3	18.5	
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =10A		0.7	1.2	v
Maximum Body-Diode Continuous Current	I _S				35	A
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =20V,V _{GS} =0V,f=1MHz		750		pF
Output Capacitance	C _{oss}			150		
Reverse Transfer Capacitance	C _{rss}			80		
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} =20V,V _{GS} =10V,I _D =20A		15		nC
Gate-Source Charge	Q _{gs}			3		
Gate-Drain Charge	Q _{gd}			2.5		
Reverse Recovery Chrage	Q _{rr}	I _S =20A, di/dt=100A/μs		26		ns
Reverse Recovery Time	t _{rr}			29		
Turn-On Delay Time	t _{d(on)}	V _{GS} =10V,V _{DD} =20V, I _D =2A,R _L =1Ω R _{GEN} =3Ω		6		
Turn-On Rise Time	t _r			17.5		
Turn-Off Delay Time	t _{d(off)}			31		
Turn-Off Fall Time	t _f			17		

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

Curve Characteristics

Fig. 1 - Typical Output Characteristics

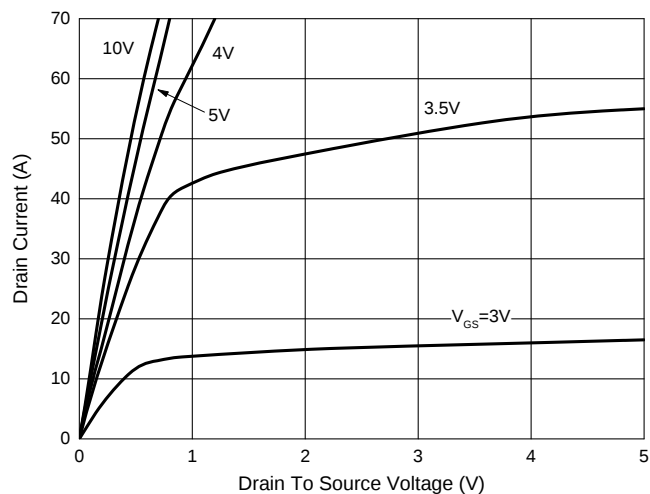


Fig. 2 - Transfer Characteristics

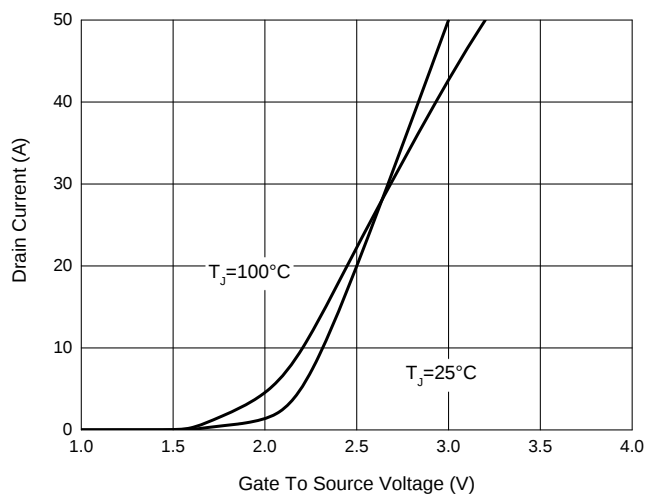


Fig. 3 - Capacitance Characteristics

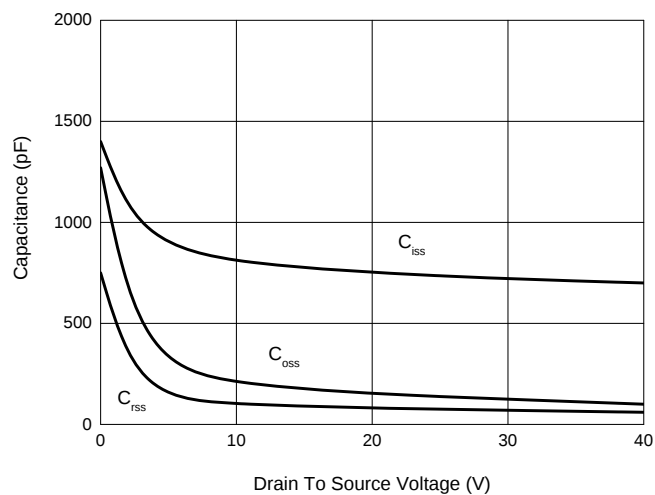


Fig. 4 - Gate Charge Characteristics

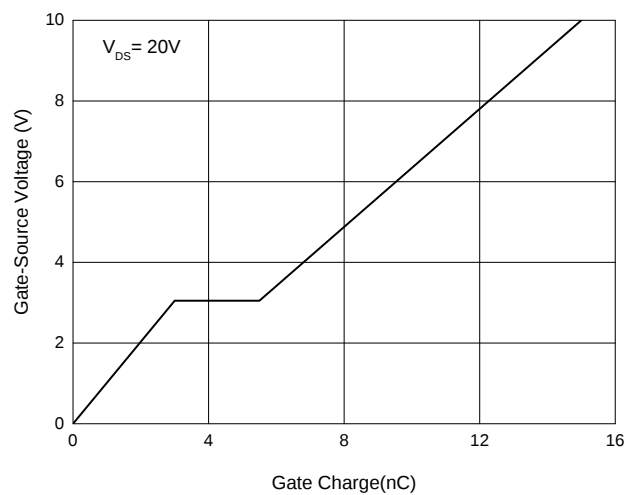


Fig. 5 - $R_{DS(ON)} - I_D$

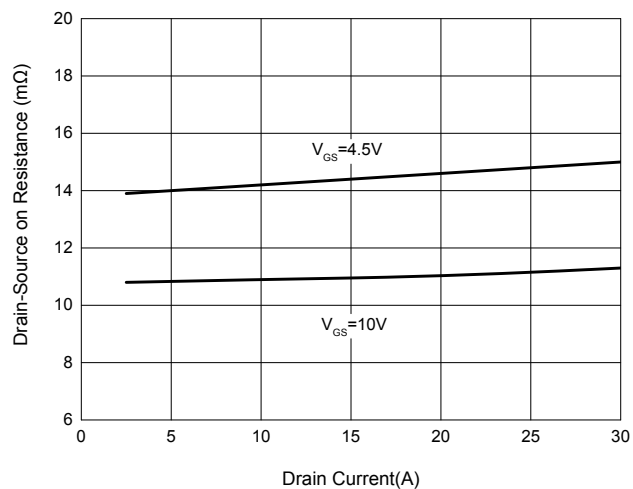
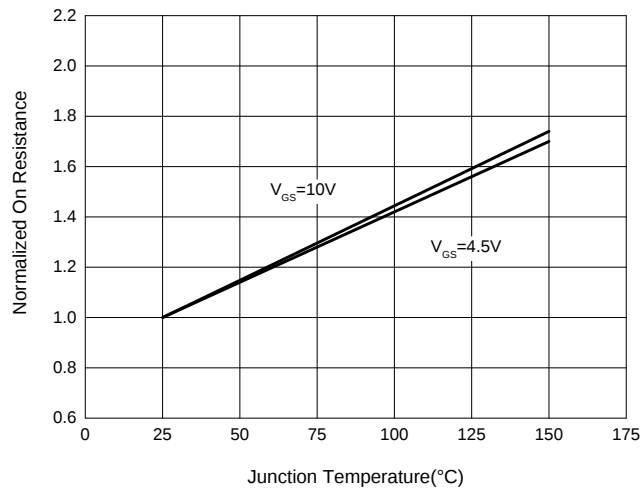


Fig. 6 - Normalized On Resistance Characteristics



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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