

**Features**

- Very Low FOM  $R_{DS(on)} \times Q_g$
- 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**

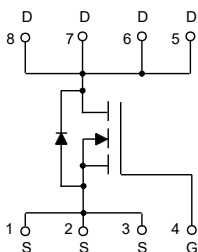
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 62°C/W Junction to Ambient
- Thermal Resistance: 1.6°C/W Junction to Case

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DS}$	650	V	
Gate-Source Voltage	$V_{GS}$	±30	V	
Continuous Drain Current	$I_D$	11	A	
Pulsed Drain Current (Note 1)	$I_{DM}$	33	A	
Single Pulse Avalanche Energy (Note 2)	$E_{AS}$	211	mJ	
Avalanche Current (Note 1)	$I_{AR}$	1.6	A	
Repetitive Avalanche Energy (Note 1)	$E_{AR}$	0.32	mJ	
Total Power Dissipation	$T_C=25^\circ\text{C}$	$P_D$	78	W

Note: 1. Repetitive Rating, Pulse Width Limited by Maximum Junction Temperature.

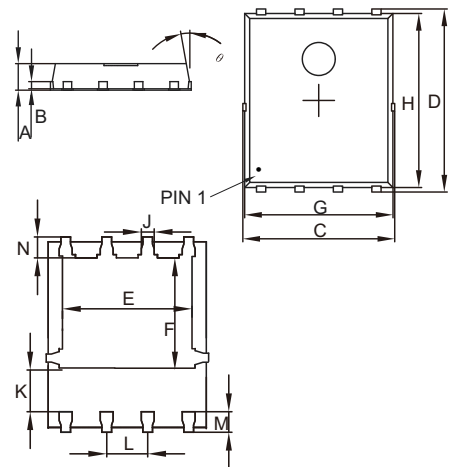
2.  $I_{AS}=1.6\text{A}$ ,  $V_{DD}=50\text{V}$ ,  $R_G=25\Omega$ , Starting  $T_J=25^\circ\text{C}$  .

**Internal Structure**



**N-CHANNEL  
Super-Junction  
Power MOSFET**

**DFN5060**



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.031	0.047	0.80	1.20	
B	0.010		0.254		TYP.
C	0.193	0.222	4.90	5.64	
D	0.232	0.250	5.90	6.35	
E	0.148	0.167	3.75	4.25	
F	0.126	0.154	3.20	3.92	
G	0.189	0.213	4.80	5.40	
H	0.222	0.239	5.65	6.06	
K	0.045	0.059	1.15	1.50	
J	0.012	0.020	0.30	0.50	
L	0.046	0.054	1.17	1.37	
M	0.012	0.028	0.30	0.71	
N	0.016	0.028	0.40	0.71	

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
<b>Static Characteristics</b>							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	650			V	
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 30V$			$\pm 100$	nA	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=650V, V_{GS}=0V$			1	$\mu A$	
		$V_{DS}=650V, V_{GS}=0V, T_J=150^\circ C$			100		
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5		4	V	
Drain-Source On-Resistance <sup>(Note 3)</sup>	$R_{DS(on)}$	$V_{GS}=10V, I_D=5.5A$		0.34	0.38	$\Omega$	
Forward transconductance <sup>(Note 3)</sup>	$g_{FS}$	$V_{DS}=10V, I_D=5.5A$		7.8		S	
<b>Dynamic Characteristics<sup>(Note 4)</sup></b>							
Input Capacitance	$C_{iss}$	$V_{DS}=50V, V_{GS}=0V, f=1MHz$		901		$\mu F$	
Output Capacitance	$C_{oss}$			50			
Reverse Transfer Capacitance	$C_{rss}$			5.5			
Total Gate Charge	$Q_g$	$V_{DD}=520V, V_{GS}=10V, I_D=11A$		21		nC	
Gate-Source Charge	$Q_{gs}$			4.5			
Gate-Drain Charge	$Q_{gd}$			7			
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=400V, I_D=11A, R_G=25\Omega$		41		ns	
Turn-On Rise Time	$t_r$			20			
Turn-Off Delay Time	$t_{d(off)}$			123			
Turn-Off Fall Time	$t_f$			6.4			
<b>Drain-Source Body Diode Characteristics</b>							
Continuous Body Diode Current	$I_S$	$T_C=25^\circ C$			9.2	A	
Pulsed Diode Forward Current	$I_{SM}$				29		
Body Diode Voltage	$V_{SD}$	$I_{SD}=11A, V_{GS}=0V$		0.9	1.2	V	
Reverse Recovery Time	$t_{rr}$	$V_R=520V, I_F=I_S, di_F/dt=100A/\mu s$		280		ns	
Reverse Recovery Charge	$Q_{rr}$				2.8		$\mu C$
Peak Reverse Recovery Current	$I_{rrm}$				17		A

Note 3. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 1\%$ .

4. ~~A~~ Guaranteed by Design, Not Subject to Production Testing.

**Curve Characteristics**

Fig. 1 - Typical Output Characteristics

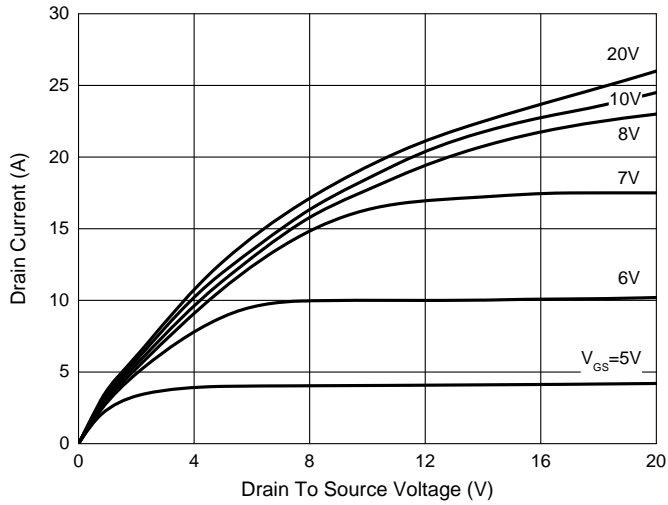


Fig. 2 - Transfer Characteristics

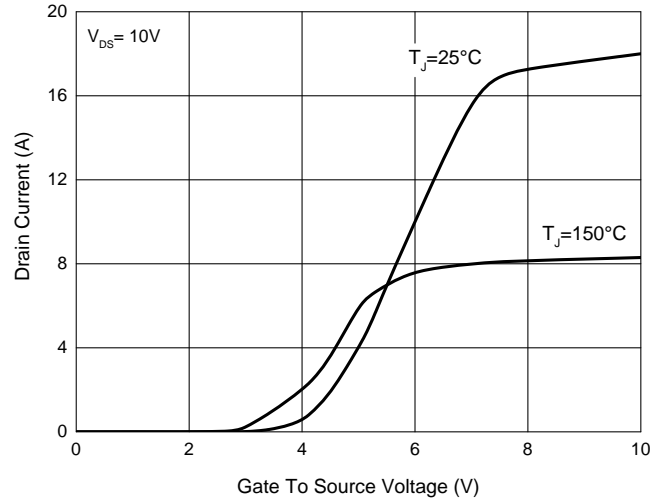


Fig. 3 -  $R_{DS(ON)} - I_D$

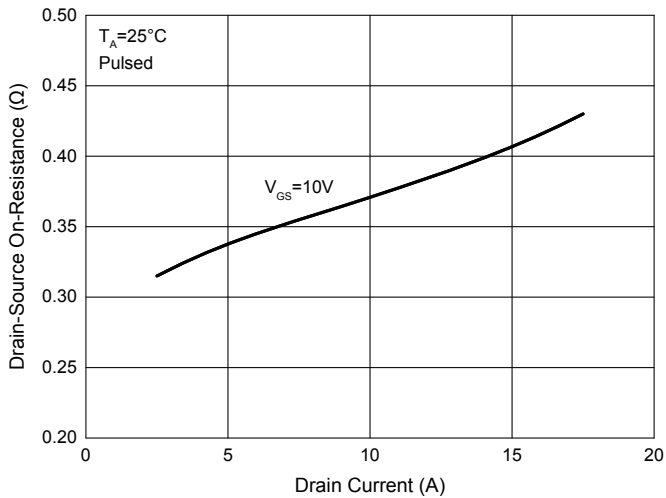


Fig. 4 - Capacitance Characteristics

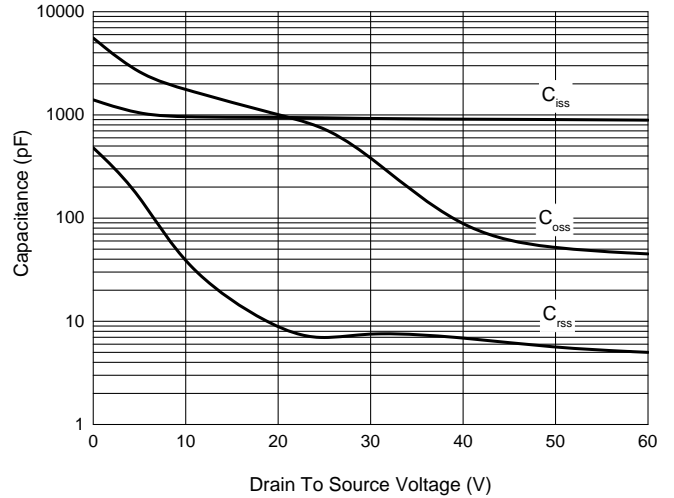


Fig. 5 - Total Gate Charge Characteristics

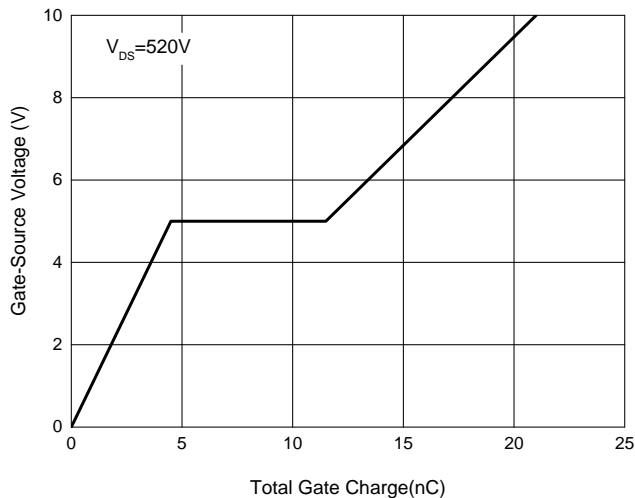
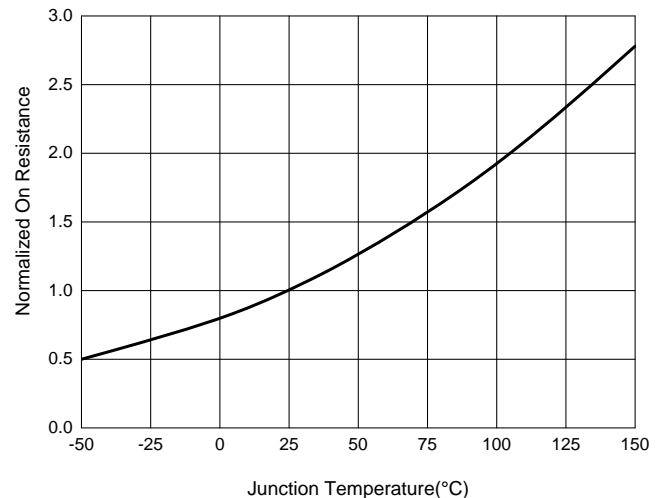


Fig. 6 - Normalized On Resistance Characteristics



## 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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