Features

- Fully Automotive Qualified to AEC-Q101
- Trench MV MOSFET Technology
- ESD HBM Class 2
- Moisture Sensitivity Level 1
- Halogen Free. “Green” Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant(Note2) ("P" Suffix Designates RoHS Compliant. See Ordering Information)

P-CHANNEL MOSFET

Maximum Ratings

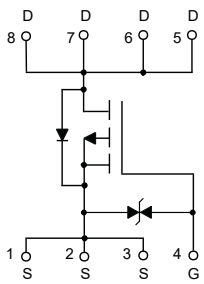
- Operating Junction Temperature Range : -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Thermal Resistance: 60°C/W Junction to Ambient (Note3)
- Thermal Resistance: 3.3°C/W Junction to Case

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage(Note4)		V_{GS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	-18	A
	T_C=100°C		-12	
Pulsed Drain Current(Note5)		I_{DM}	-72	A
Total Power Dissipation(Note6)		P_D	45	W
Single Pulsed Avalanche Energy(Note7)		E_{AS}	25	mJ

Note:

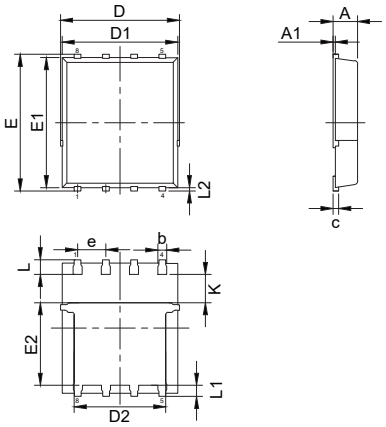
1. Halogen free "Green” products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. High Temperature Solder Exemption Applied, see EU Directive Annex 7(a)-I.
3. The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.
4. VGS=-20V/+10V according AEC-Q101 at Tj=175°C.
5. Repetitive rating; pulse width limited by max. junction temperature.
6. P_D is based on max. junction temperature, using junction-case thermal resistance.
7. T_J=25°C, V_{DD}=-30V, V_{GS}=-10V, R_G=25Ω, L=0.1mH.

Internal Structure and Marking Code



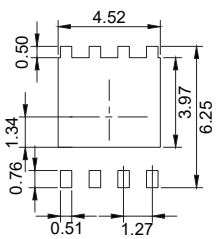
4 codes in total
YY is the year
WW is the week

PDFN5060



DIM	INCH		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.039	0.052	1.00	1.30	
A1	0.000	0.004	0.00	0.10	
b	0.011	0.022	0.30	0.55	x8
c	0.010		0.25		TYP
D	0.192	0.219	4.90	5.55	
D1	0.185	0.215	4.70	5.45	
D2	0.149	0.171	3.80	4.32	
E	0.228	0.250	5.80	6.35	
E1	0.220	0.239	5.60	6.06	
E2	0.129	0.155	3.30	3.92	
e	0.050		1.27		TYP
K	0.053		1.34		TYP
L	0.011	0.030	0.30	0.76	
L1	0.015	0.030	0.40	0.75	
L2	0.006		0.15		TYP

Suggested Solder Pad Layout



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	-60			V
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS} =±20V			±10	μA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-60V, V_{GS}=0V			-1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.2	-1.9	-2.8	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=-10V, I_D=-10A		45	60	mΩ
		V_{GS}=-4.5V, I_D=-5A		65	110	
Gate Resistance	R_g	f=1MHz,Open Drain		7.5		Ω
Diode Characteristics						
Continuous Body Diode Current	I_S				-18	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-10A			-1.2	V
Reverse Recovery Time	t_{rr}	I_F=-10A,dI_F/dt=100A/μs		27		ns
Reverse Recovery Charge	Q_{rr}			39		nC
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=-30V,V_{GS}=0V,f=1MHz		1274		pF
Output Capacitance	C_{oss}			80		
Reverse Transfer Capacitance	C_{rss}			69		
Total Gate Charge	Q_g	V_{DS}=-30V,V_{GS}=-10V,I_D=-10A		28.3		nC
Gate-Source Charge	Q_{gs}			4.6		
Gate-Drain Charge	Q_{gd}			5.6		
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=-30V,V_{GS}=-10V, R_G=3Ω, I_{DS}=-10A		8.4		ns
Turn-On Rise Time	t_r			11.5		
Turn-Off Delay Time	$t_{d(off)}$			39		
Turn-Off Fall Time	t_f			23		

Curve Characteristics

Fig. 1 - Typical Output Characteristics

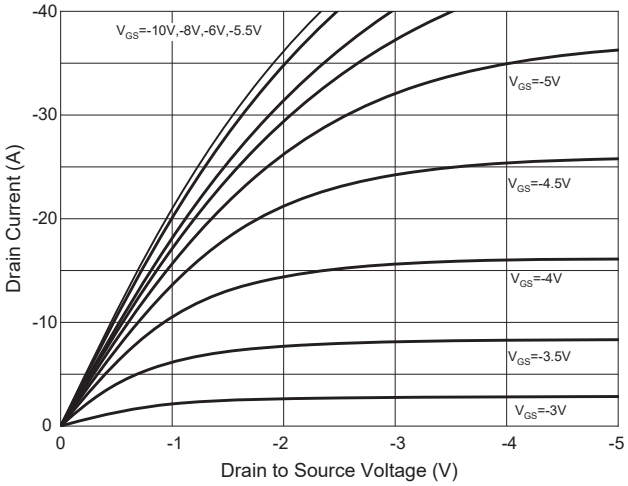


Fig. 2 - Transfer Characteristics

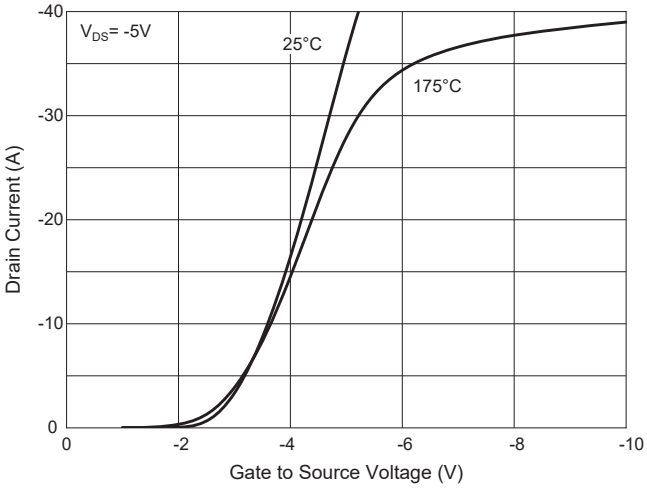


Fig. 3 - $R_{DS(ON)}$-V_{GS}

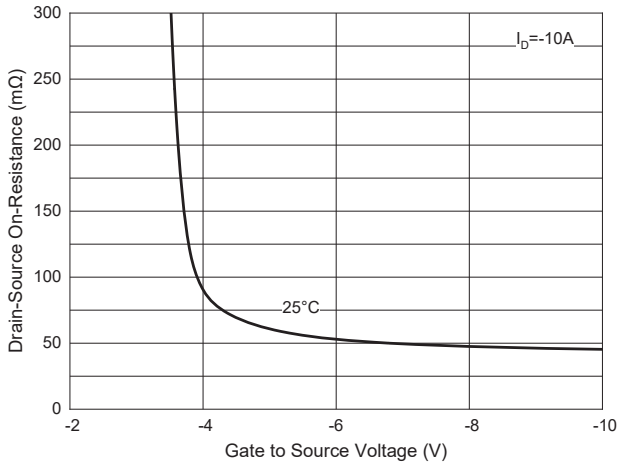


Fig. 4 - $R_{DS(ON)}$-I_D

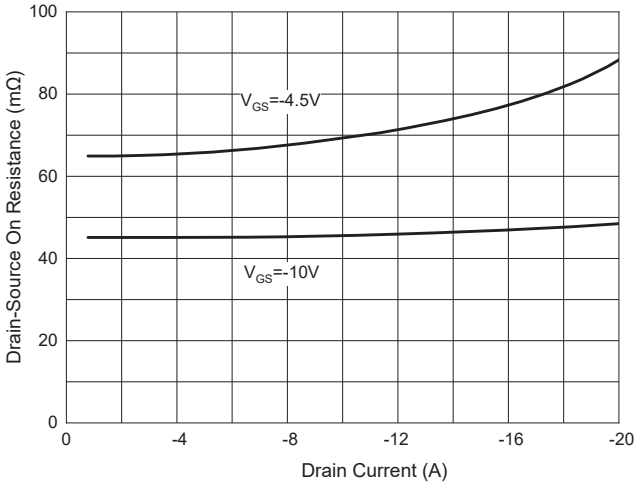


Fig. 5 - Capacitance Characteristics

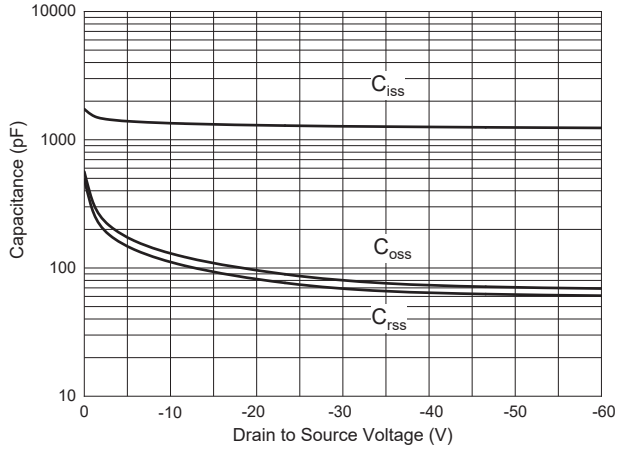
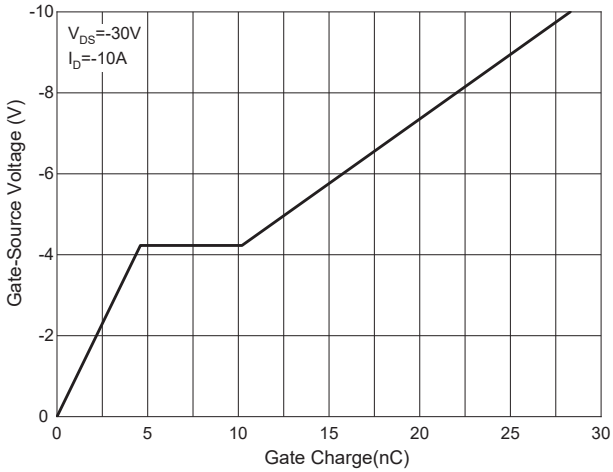


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - Normalized Threshold Voltage

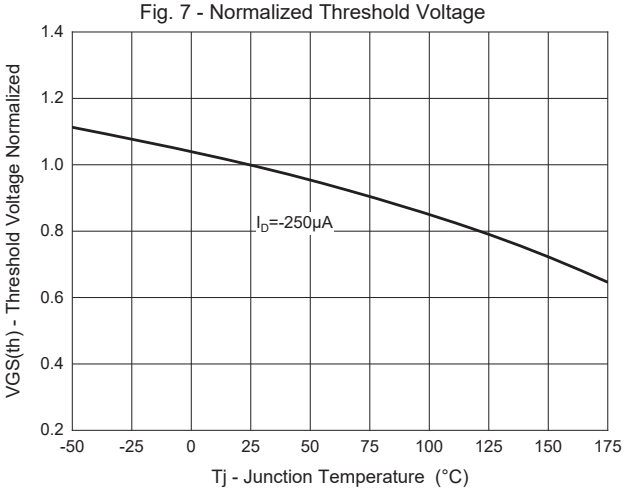


Fig. 8 - Normalized On Resistance Characteristics

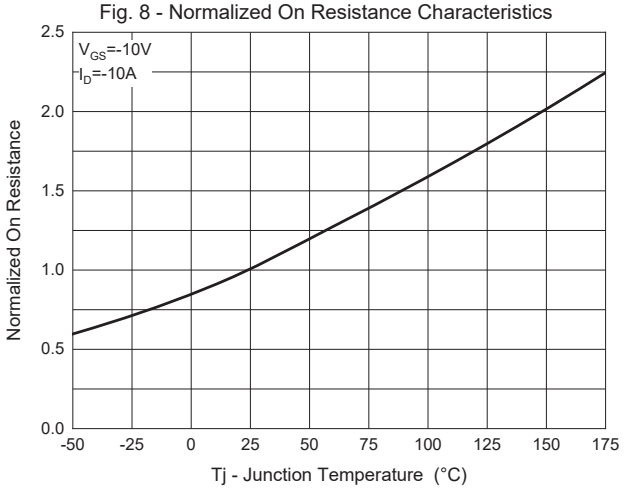


Fig. 9 - I_S-V_{SD}

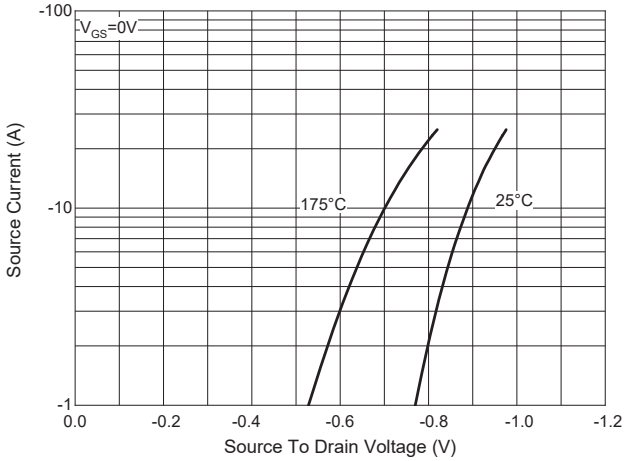


Fig. 10 - Drain Current

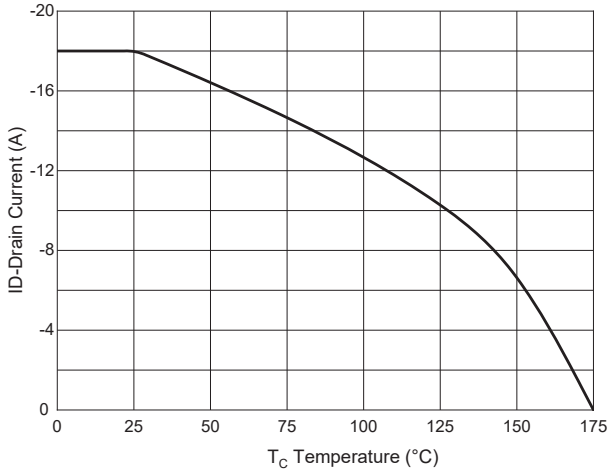
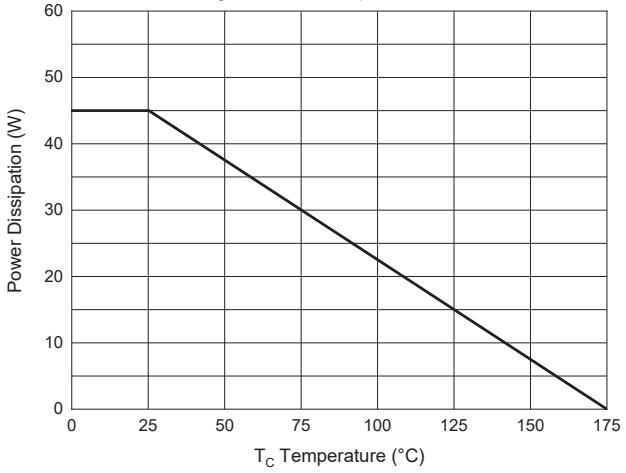


Fig. 11 - PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

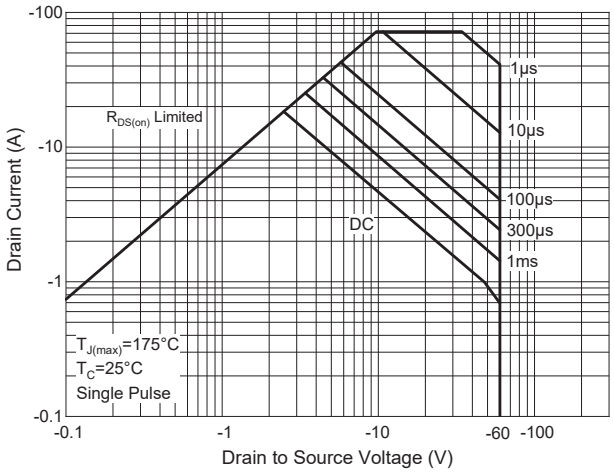
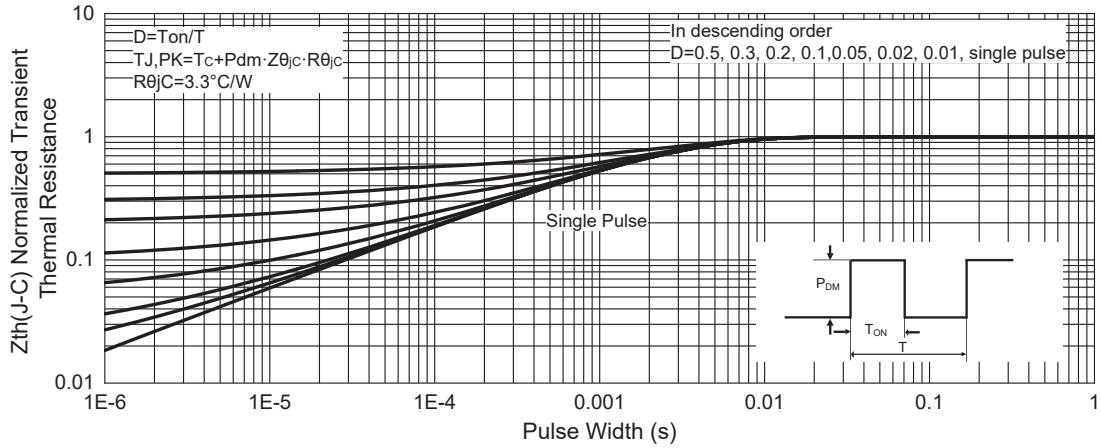


Fig. 13 - Normalized Transient Thermal Impedance



Ordering Information

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