

Features

- Split Gate Trench MOSFET Technology
- Dual-Side Cooling Package with Excellent Heat Dissipation
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant (Note2)("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

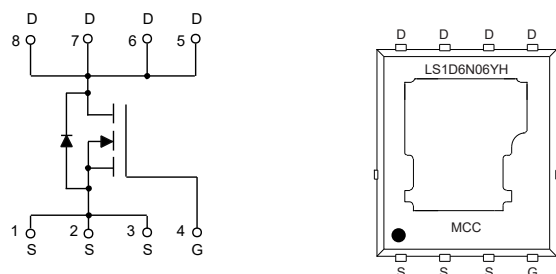
- Operating Junction Temperature Range : -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Thermal Resistance: 50°C/W Junction to Ambient (Note3)
- Thermal Resistance: 0.33°C/W Junction to Case(Top)
- Thermal Resistance: 0.33°C/W Junction to Case(Bottom)

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	V_{DS}	60	V	
Gate-Source Voltage	V_{GS}	±20	V	
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$	300	A
		$T_C=100^\circ\text{C}$	212	
Pulsed Drain Current (Note4)	I_{DM}	1200	A	
Total Power Dissipation (Note5)	P_D	454	W	
Avalanche Energy (Note6)	E_{AS}	670	mJ	

Note:

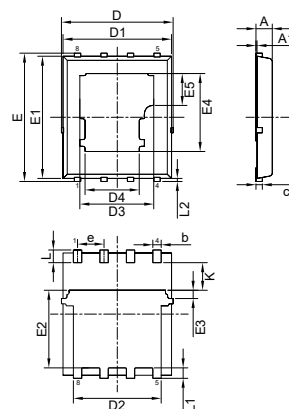
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. High Temperature Solder Exemption Applied, see EU Directive Annex 7(a)-I.
3. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.
4. Repetitive rating; pulse width limited by max. junction temperature.
5. P_D is based on max. junction temperature, using junction-case (Bottom) thermal resistance.
6. $T_J = 25^\circ\text{C}$, $V_{DD} = 30\text{V}$, $V_{GS} = 10\text{V}$, $R_G = 25\Omega$, $L = 0.5\text{mH}$.

Internal Structure and Marking Code



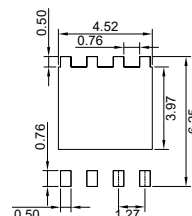
N-CHANNEL MOSFET

PDFN5060-DSC-B



DIM	INCH		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.024	0.033	0.60	0.85	
A1		0.004		0.10	
b	0.012	0.020	0.30	0.50	×8
c	0.008	0.012	0.20	0.30	
D	0.203	0.219	5.15	5.55	
D1	0.197	0.213	5.00	5.40	
D2	0.158	0.174	4.01	4.41	
D3	0.139		3.54		TYP
D4	0.102		2.60		TYP
E	0.234	0.250	5.95	6.35	
E1	0.223	0.239	5.66	6.06	
E2	0.139	0.154	3.52	3.92	
E3	0.016		0.40		TYP
E4	0.147		3.74		TYP
E5	0.060		1.53		TYP
e	0.050		1.27		TYP
L	0.020	0.028	0.50	0.71	
L1	0.020		0.51		TYP
L2	0.006		0.15		TYP
K	0.052		1.32		TYP

Suggested Pad Layout (Unit:mm)



Electrical Characteristics @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=1mA$	60			V
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=48V, V_{GS}=0V$			1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		1.38	1.68	m Ω
Gate Resistance	R_G	f=1 MHz, Open Drain		2.5		Ω
Diode Characteristics						
Continuous Body Diode Current	I_S				300	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=20A$			1.2	V
Reverse Recovery Time	t_{rr}	$I_F=20A, dI_F/dt=100A/\mu s$		40		ns
Reverse Recovery Charge	Q_{rr}			33		nC
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V, f=1MHz$		4746		pF
Output Capacitance	C_{oss}			2165		
Reverse Transfer Capacitance	C_{rss}			204		
Total Gate Charge	Q_g	$V_{DS}=30V, V_{GS}=10V, I_D=20A$		80		nC
Gate-Source Charge	Q_{gs}			24		
Gate-Drain Charge	Q_{gd}			17.7		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=30V, V_{GS}=10V, R_G=3\Omega, I_{DS}=20A$		19		ns
Turn-On Rise Time	t_r			38		
Turn-Off Delay Time	$t_{d(off)}$			59		
Turn-Off Fall Time	t_f			53		

Curve Characteristics

Fig.1 - Typical Output Characteristics

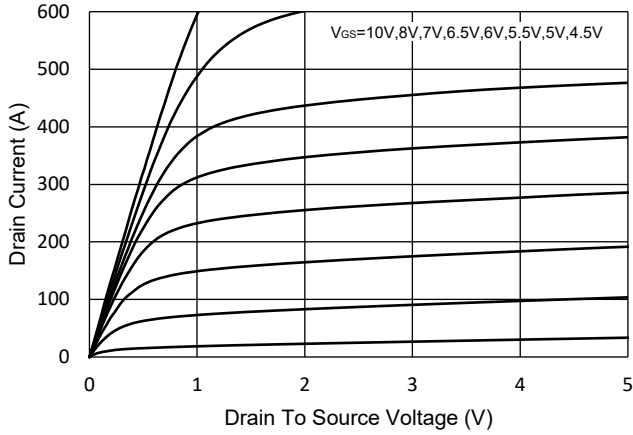


Fig.2 - Transfer Characteristics

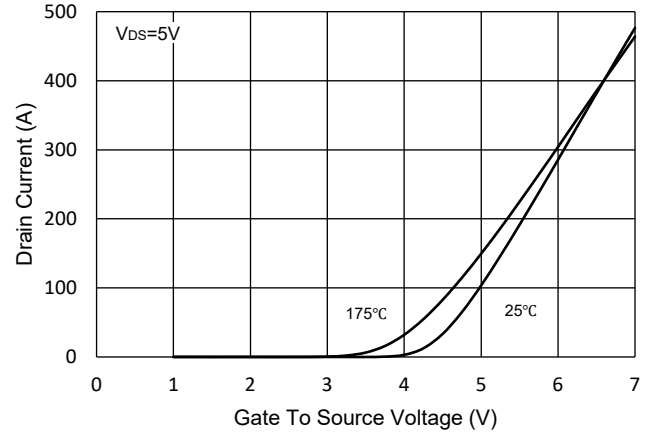


Fig.3 - $R_{DS(ON)}$ - V_{GS}

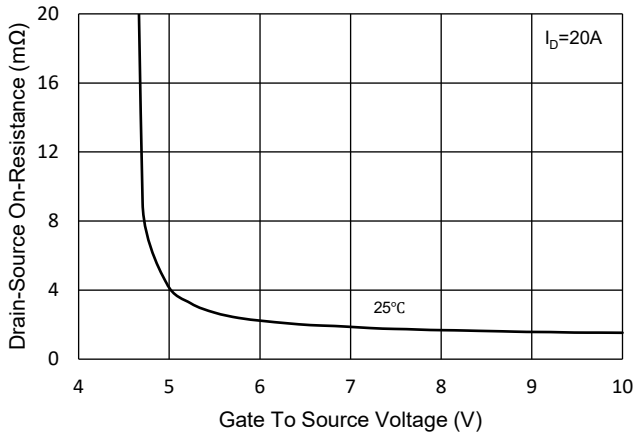


Fig.4 - $R_{DS(ON)}$ - I_D

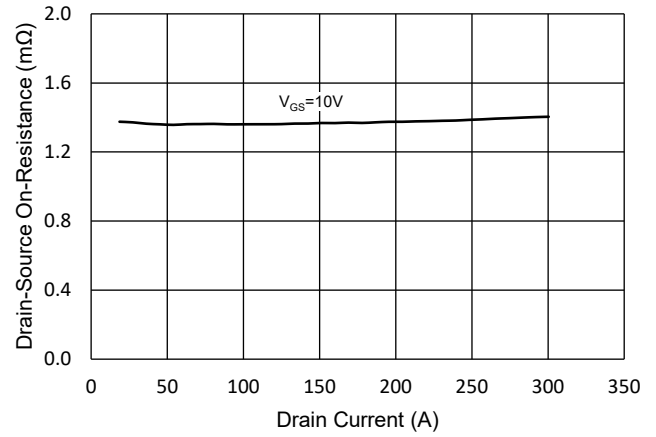


Fig.5 - Capacitance Characteristics

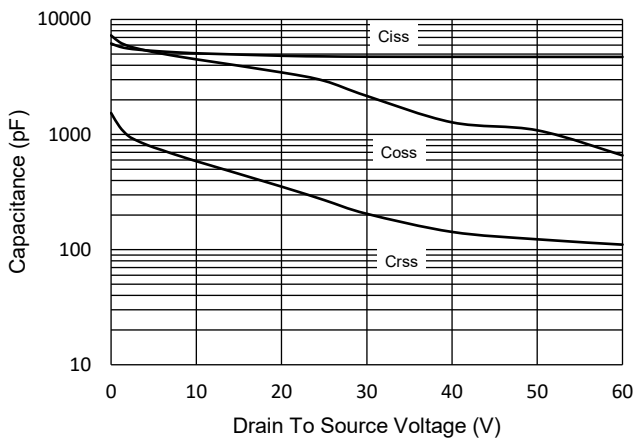
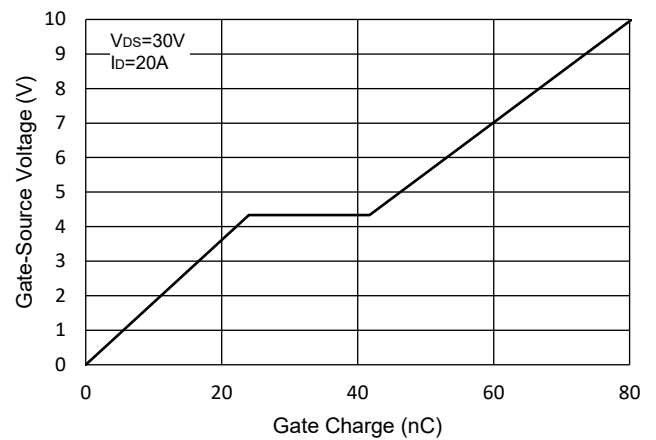


Fig.6 - Gate Charge



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

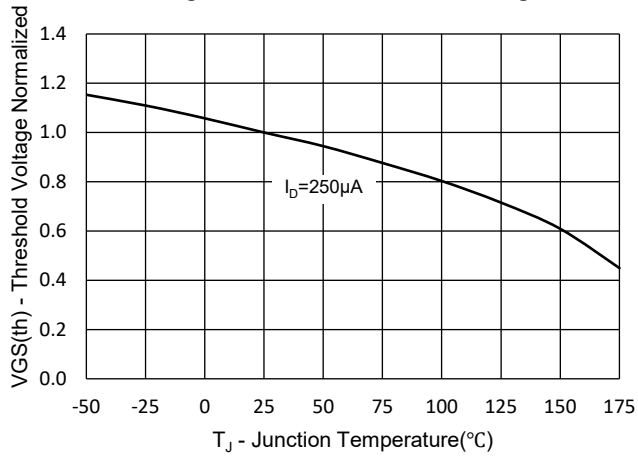


Fig.8 - Normalized On Resistance Characteristics

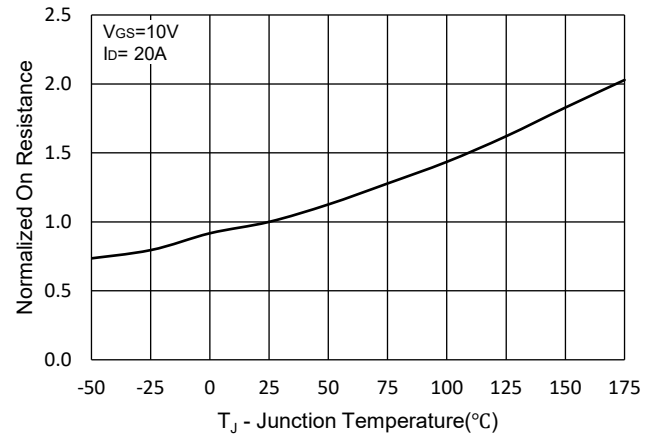


Fig.9 - $I_S - V_{SD}$

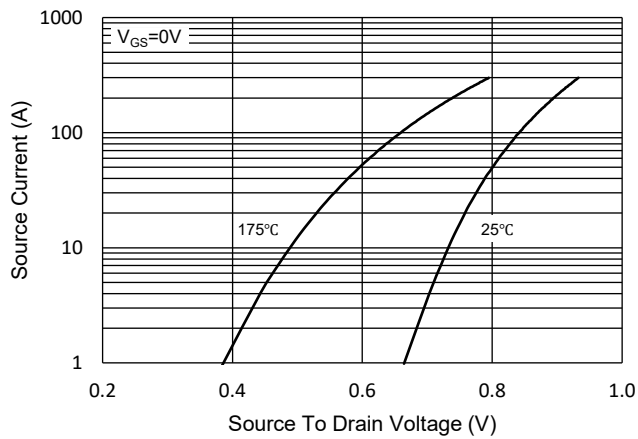


Fig.10 - Drain Current

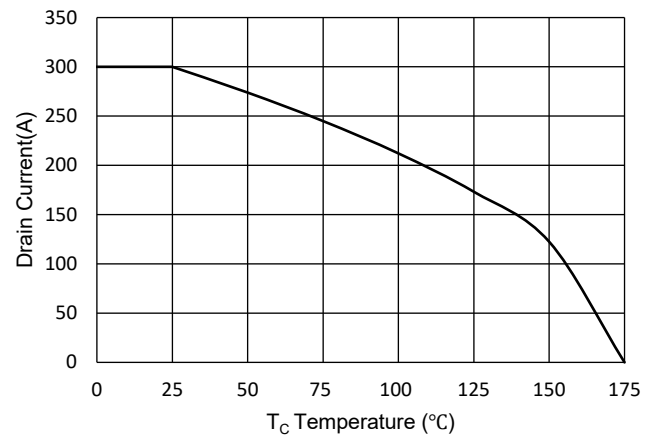
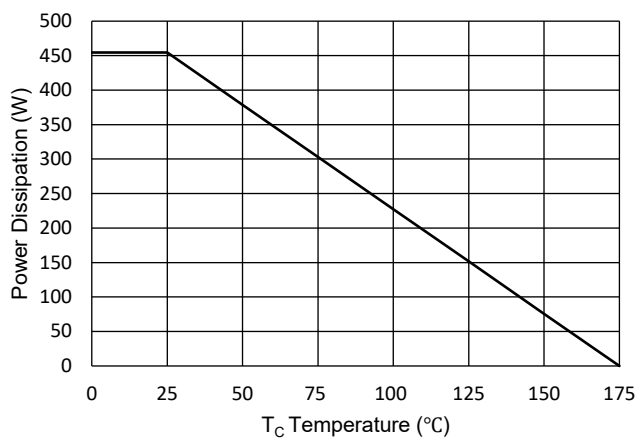


Fig.11 - PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

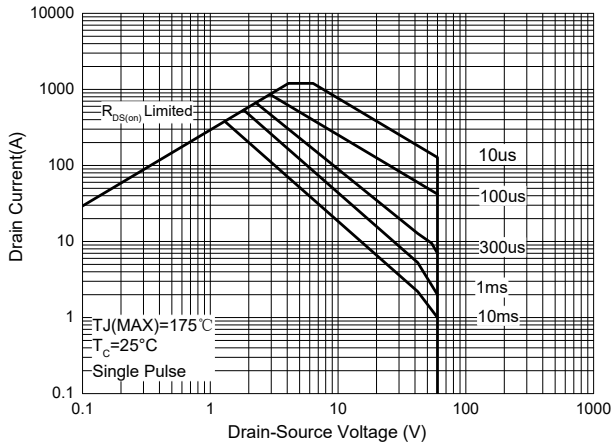


Fig. 13 - Normalized Transient Thermal Impedance(Top)

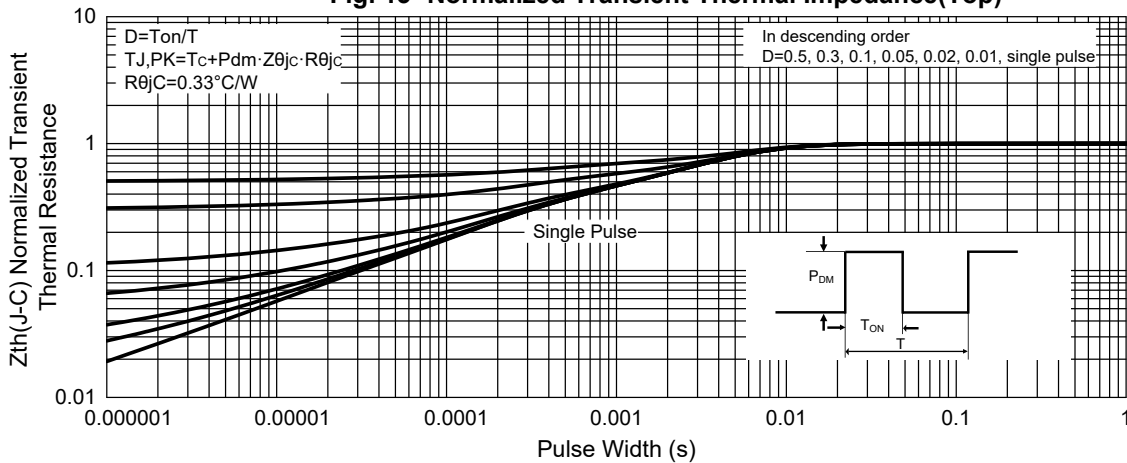
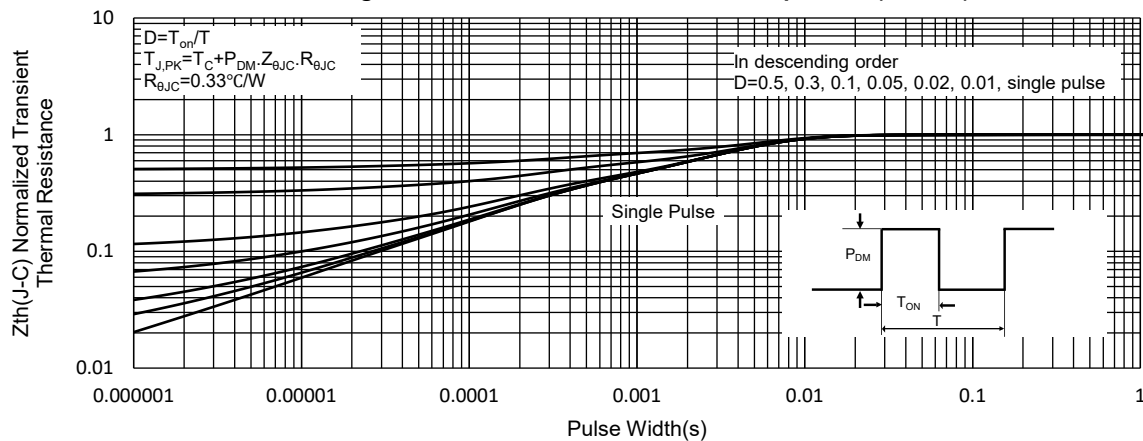


Fig.14 - Normalized Transient Thermal Impedance(Bottom)



Ordering Information

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

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