

Features

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

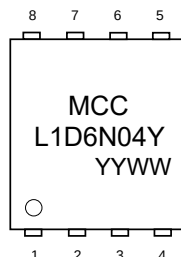
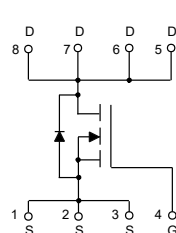
- Operating Junction Temperature Range : -55°C to $+175^{\circ}\text{C}$
- Storage Temperature Range: -55°C to $+175^{\circ}\text{C}$
- Thermal Resistance: 54°C/W Junction to Ambient (Note3)
- Thermal Resistance: 1°C/W Junction to Case

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V _{DS}	40	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current	T _C =25°C	I _D	220	A
	T _C =100°C		155	
Pulsed Drain Current ^(Note4)		I _{DM}	880	A
Total Power Dissipation ^(Note5)		P _D	150	W
Single Pulse Avalanche Energy ^(Note6)		E _{AS}	240	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 thermal resistance.
6. $T_J=25^{\circ}\text{C}$, $V_{DD}=20\text{V}$, $V_{GS}=10\text{V}$, $R_G=25\Omega$, $L=0.5\text{mH}$.

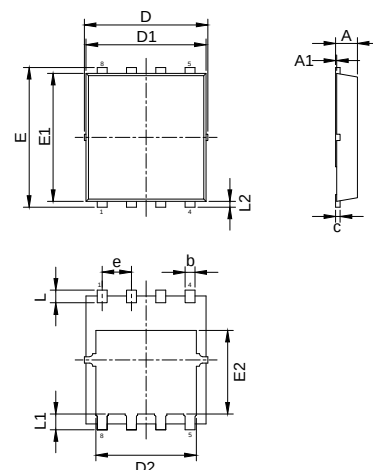
Internal Structure and Marking Code



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

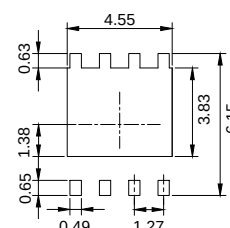
N-CHANNEL MOSFET

PDFN5060-C



DIM	INCH		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.033	0.046	0.85	1.15	
A1	0.000	0.004	0.00	0.10	
b	0.011	0.020	0.30	0.50	x8
c	0.008		0.20		TYP
D	0.206	0.221	5.25	5.60	
D1	0.200	0.209	5.10	5.30	
D2	0.167	0.176	4.25	4.45	
E	0.234	0.243	5.95	6.15	
E1	0.214	0.223	5.45	5.65	
E2	0.138	0.147	3.52	3.73	
e	0.050		1.27		TYP
L	0.017	0.026	0.45	0.65	
L1		0.027		0.68	TYP
L2		0.010		0.25	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	40			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =32V, V _{GS} =0V			1	μA
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.0	2.9	4.0	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =50A		1.2	1.6	mΩ
Gate Resistance	R _G	f=1MHz, Open Drain		1.6		Ω
Diode Characteristics						
Maximum Body-Diode Continuous Current	I _S				220	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =50A			1.2	V
Reverse Recovery Time	t _{rr}	I _F =50A, di/dt=100A/μs		19		ns
Reverse Recovery Charge	Q _{rr}			5		nC
Dynamic Characteristics						
Input Capacitance	C _{iSS}	V _{DS} =20V, V _{GS} =0V, f=1MHz		2432		pF
Output Capacitance	C _{oSS}			1423		
Reverse Transfer Capacitance	C _{rSS}			109		
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =20V, I _D =50A		39.7		nC
Gate-Source Charge	Q _{gs}			12.5		
Gate-Drain Charge	Q _{gd}			12.3		
Turn-On Delay Time	t _{d(on)}	V _{GS} =10V, V _{DD} =20V, I _{DS} =50A, R _G =3Ω		14		ns
Turn-On Rise Time	t _r			92		
Turn-Off Delay Time	t _{d(off)}			25		
Turn-Off Fall Time	t _f			15		

Curve Characteristics

Fig. 1 - Typical Output Characteristics

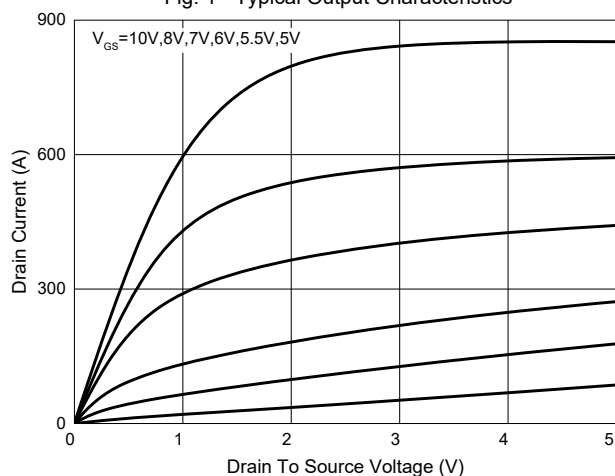


Fig. 2 - Transfer Characteristics

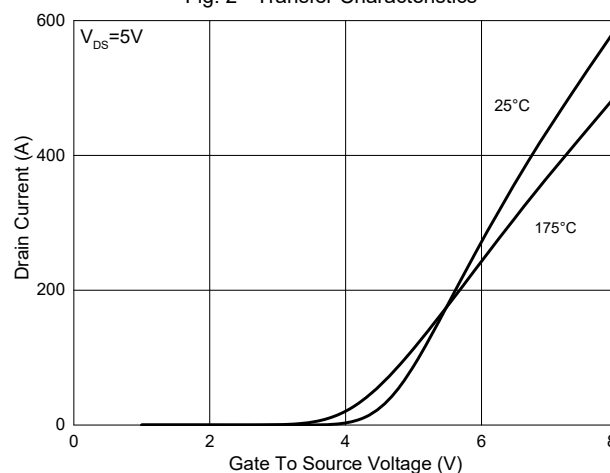


Fig. 3 - $R_{DS(ON)} - V_{GS}$

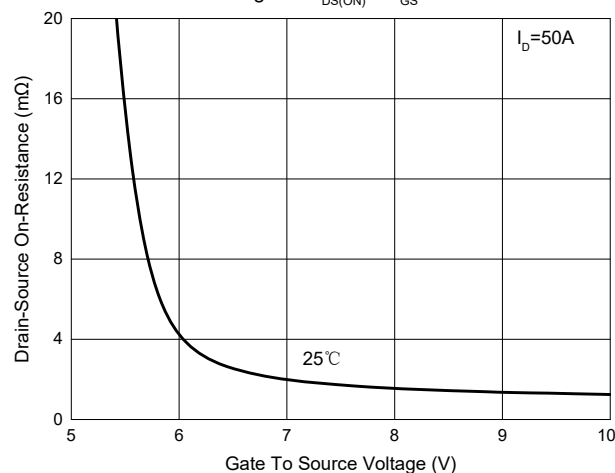


Fig. 4 - $R_{DS(ON)} - I_D$

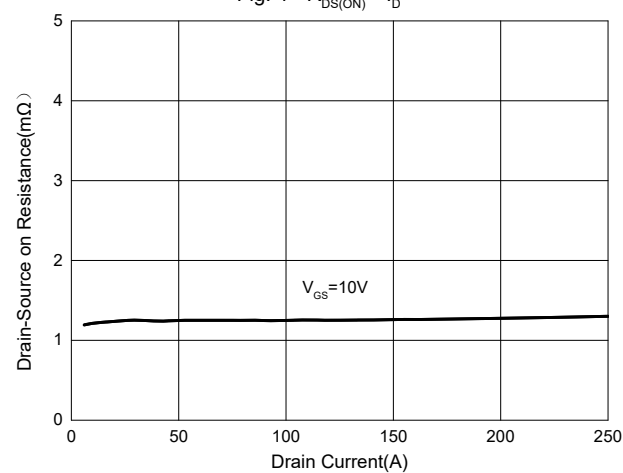


Fig. 5 - Capacitance Characteristics

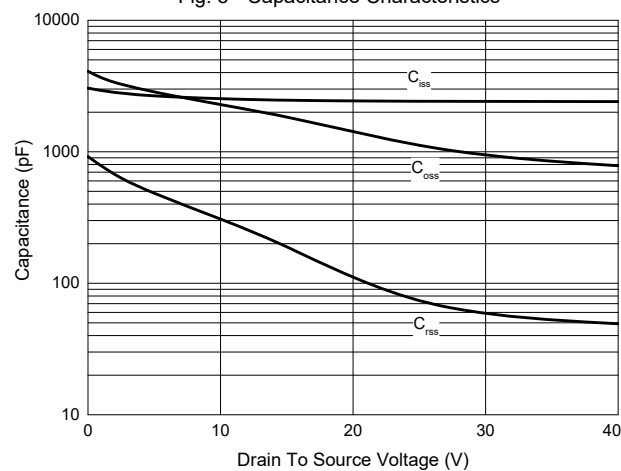
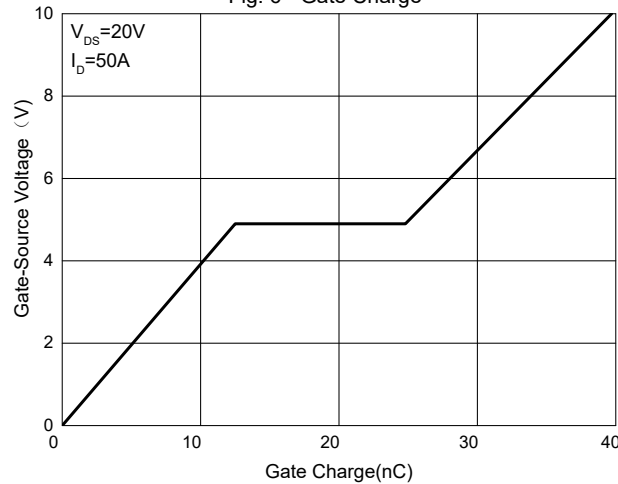


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - Normalized Threshold Voltage

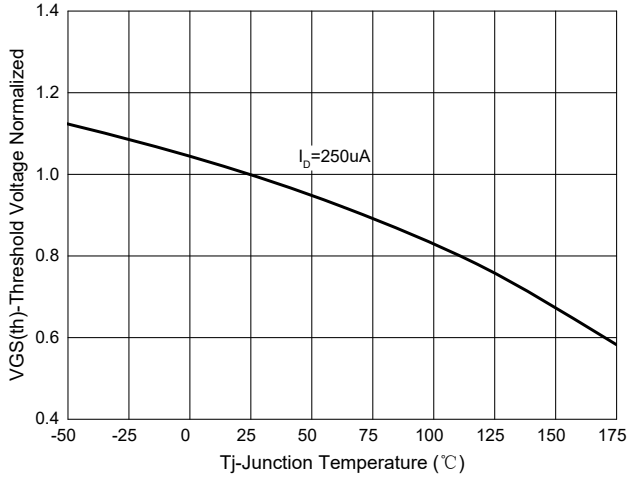


Fig.8-Normalized On Resistance Characteristics

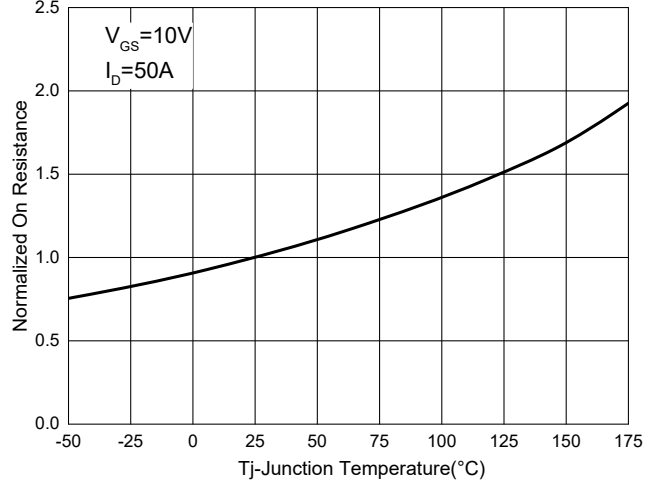


Fig.9 - $I_S - V_{SD}$

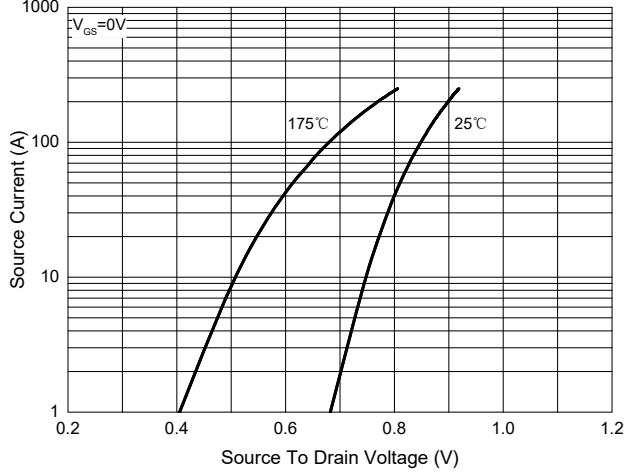


Fig. 10 - Drain Current

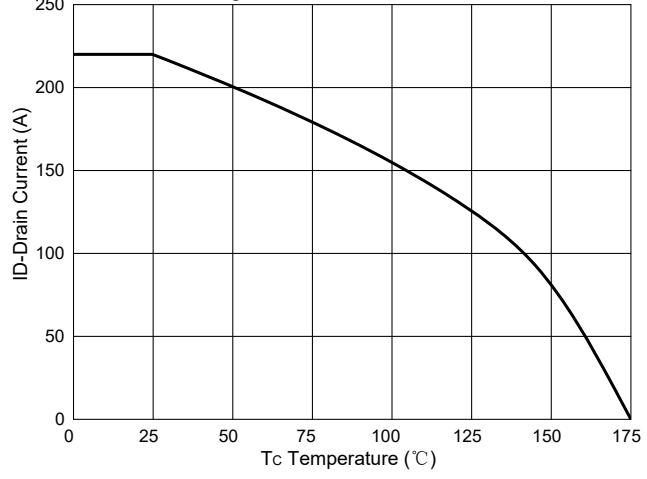
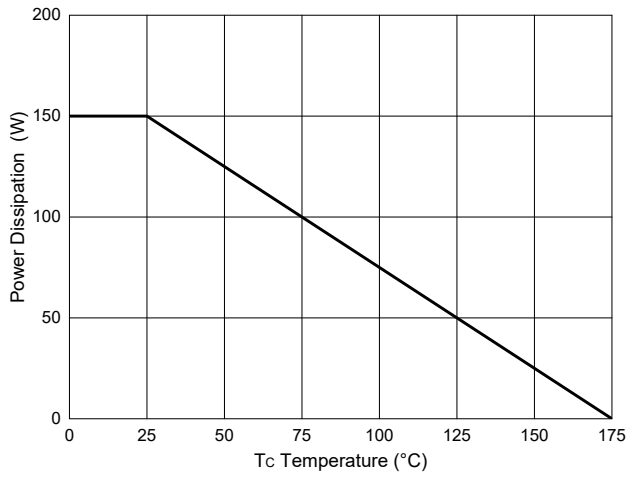


Fig.11-PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

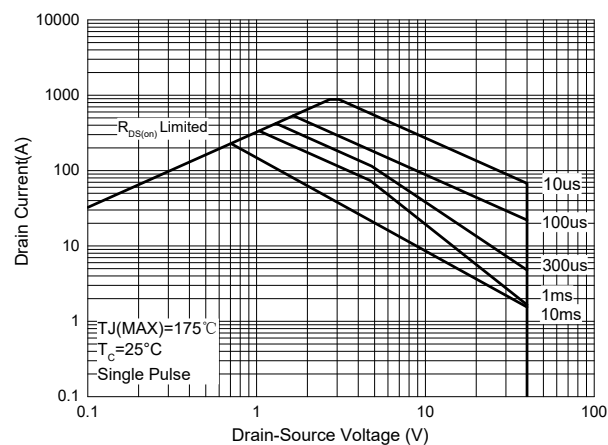
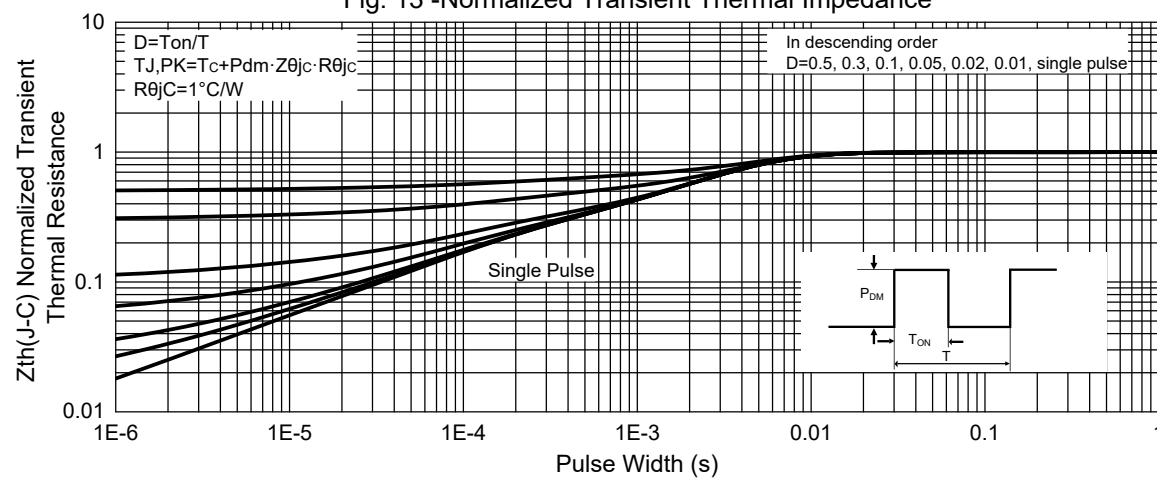


Fig. 13 -Normalized Transient Thermal Impedance



Ordering Information

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

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