

Features

- Trench LV MOSFET Technology
- 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)

Maximum Ratings

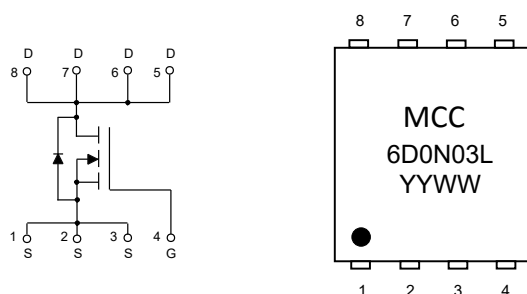
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 55°C/W Junction to Ambient (Note3)
- Thermal Resistance: 2.1°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$ 77.8	A
		$T_C=100^\circ\text{C}$ 49	
Pulsed Drain Current (Note4)	I_{DM}	311.2	A
Total Power Dissipation (Note5)	P_D	59.5	W
Single Pulse Avalanche Energy (Note 6)	E_{AS}	98	mJ

Note:

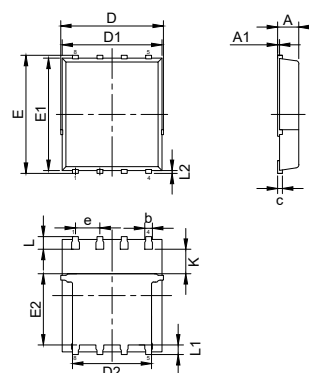
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. High Temperature Solder Exemption Applied, see EU Directive Annex 7(a)-I.
3. The value of $R_{\theta JA}$ is measured with the device mounted 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. $T_J=25^\circ\text{C}$, $V_{DS}=25\text{V}$, $V_{GS}=10\text{V}$, $R_G=25\Omega$, $L=1\text{mH}$.

Internal Structure and Marking Code



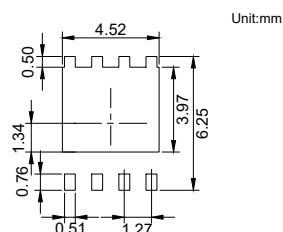
N-CHANNEL MOSFET

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	30			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		3.9	6.0	mΩ
		V _{GS} =4.5V, I _D =15A		6.0	8.0	
Gate Resistance	R _G	f=1MHz, Open drain		2.3		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				77.8	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =20A			1.2	V
Reverse Recovery Time	t _{rr}	I _F =20A, di/dt=100A/μs		16.6		ns
Reverse Recovery Charge	Q _{rr}			8		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1MHz		1712		pF
Output Capacitance	C _{oss}			296		
Reverse Transfer Capacitance	C _{rss}			272		
Total Gate Charge	Q _g	V _{DS} =15V, V _{GS} =10V, I _D =20A		37.9		nC
Gate-Source Charge	Q _{gs}			4.8		
Gate-Drain Charge	Q _{gd}			10.6		
Turn-On Delay Time	t _{d(on)}	V _{DD} =15V, V _{GS} =10V, R _G =3Ω, I _D =20A		10.4		ns
Turn-On Rise Time	t _r			30.7		
Turn-Off Delay Time	t _{d(off)}			34.9		
Turn-Off Fall Time	t _f			14.8		

Curve Characteristics

Fig. 1 - Typical Output Characteristics

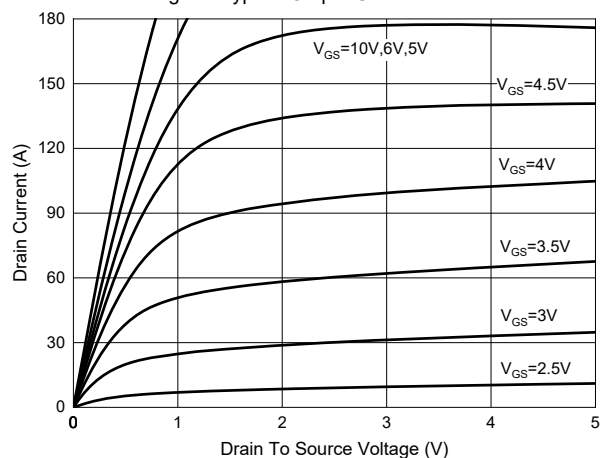


Fig. 2 - Transfer Characteristics

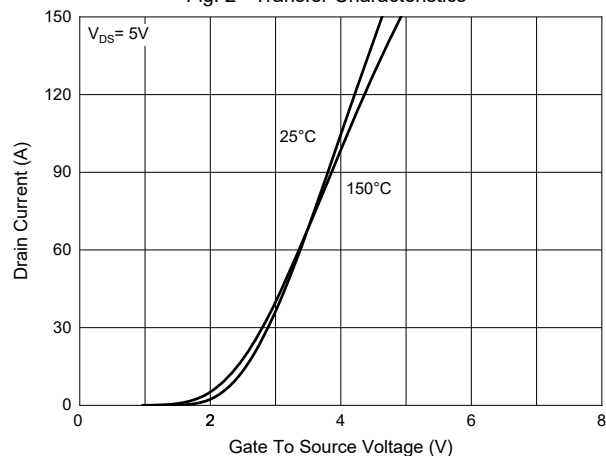


Fig.3- $R_{DS(ON)}$ - V_{GS}

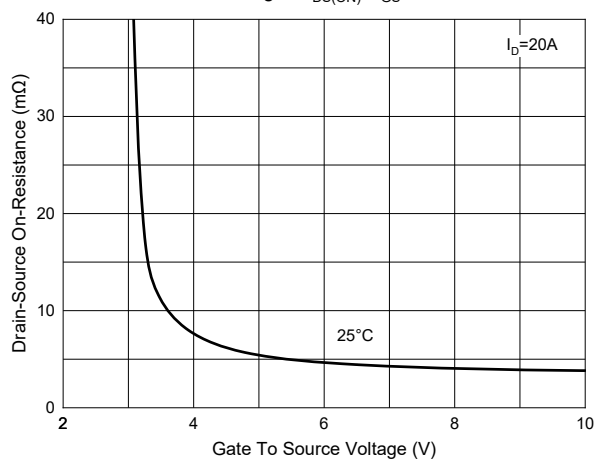


Fig.4- $R_{DS(ON)}$ - I_D

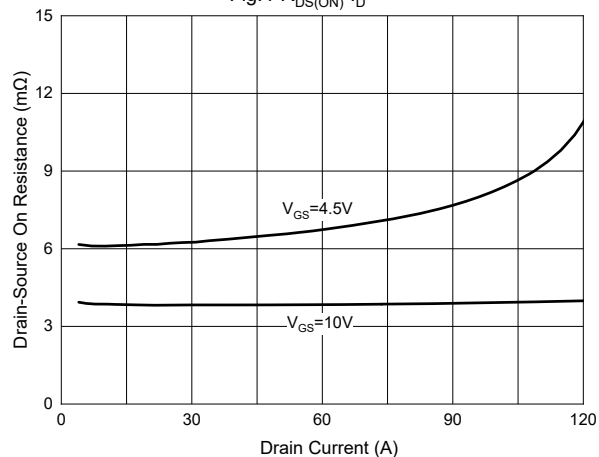


Fig. 5 - Capacitance Characteristics

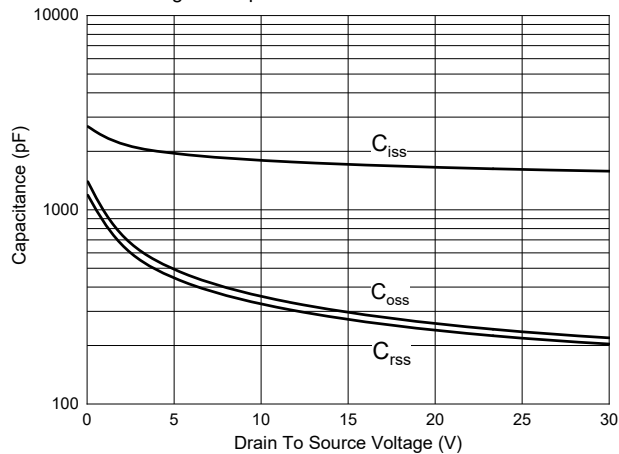
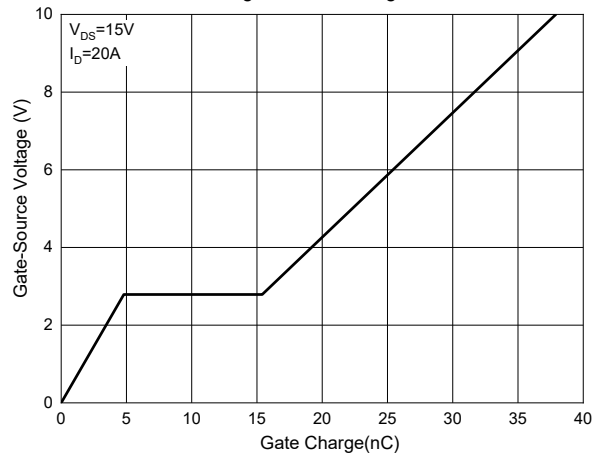


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - Normalized Threshold Voltage

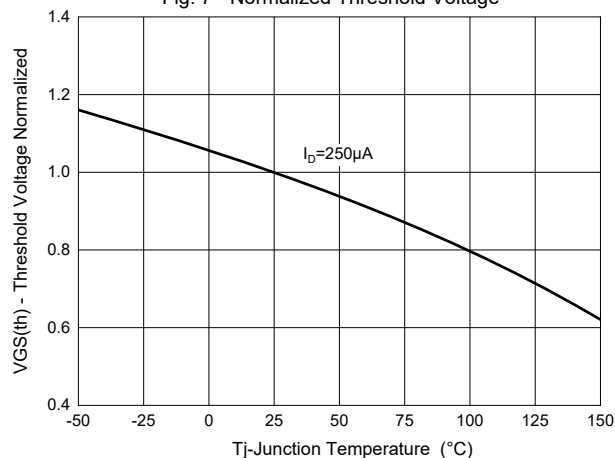


Fig. 8 - Normalized On Resistance Characteristics

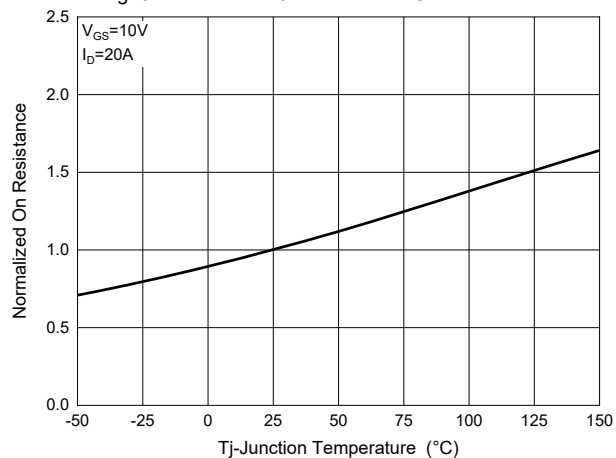


Fig.9- I_S-V_{SD}

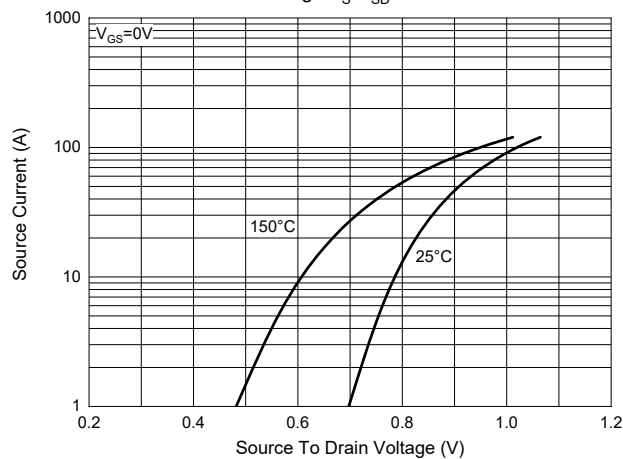


Fig. 10 - Drain Current

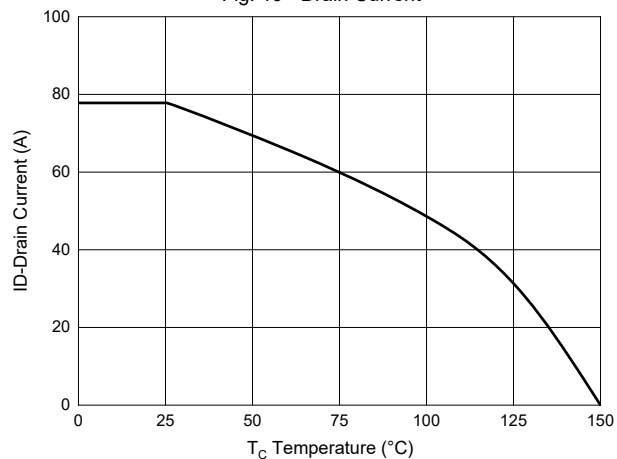
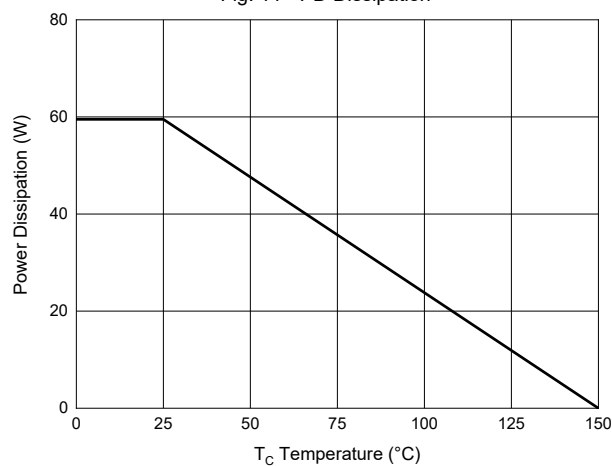


Fig. 11 - PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

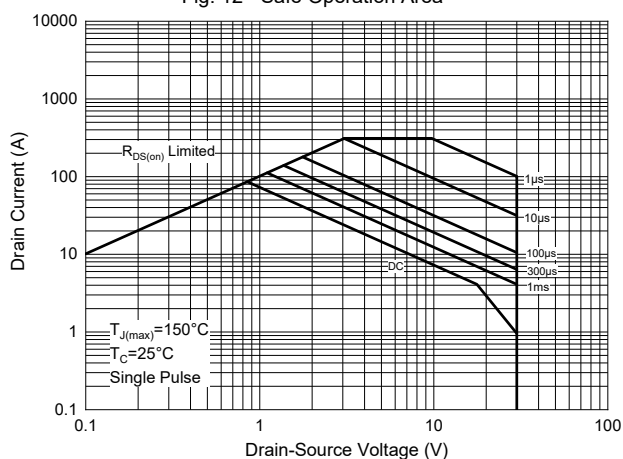
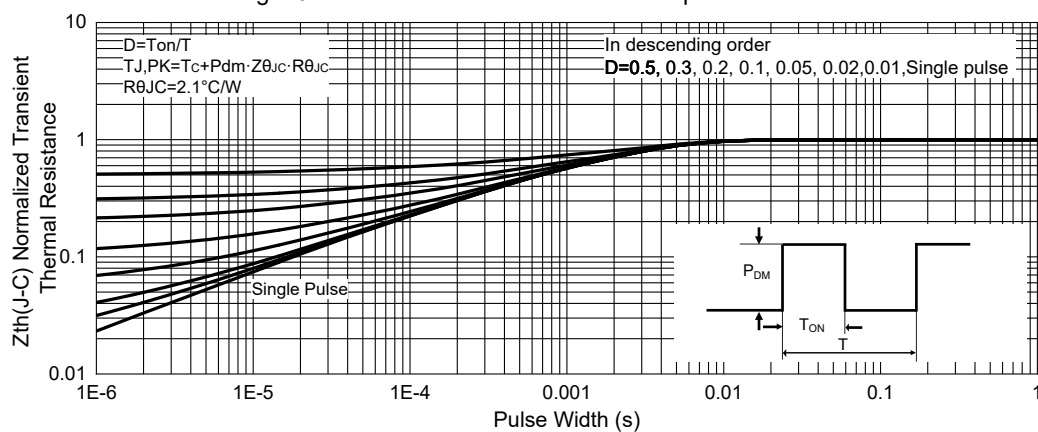


Fig. 13 - Normalized Transient Thermal Impedance



Ordering Information

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

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