

## Features

- Fully Automotive Qualified to AEC-Q101
- Split Gate Trench MOSFET Technology
- High Density Cell Design For Ultra Low  $R_{DS(on)}$
- Moisture Sensitivity Level 1
- Halogen Free "Green" Device<sup>(Note1)</sup>
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

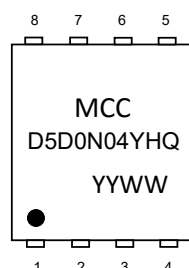
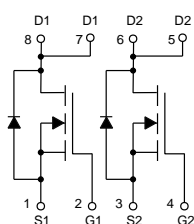
- Operating Junction Temperature Range : -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Thermal Resistance: 60°C/W Junction to Ambient<sup>(Note2)</sup>
- Thermal Resistance: 2°C/W Junction to Case

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V <sub>DS</sub>	40	V
Gate-Source Voltage		V <sub>GS</sub>	±20	V
Continuous Drain Current	T <sub>C</sub> =25°C	I <sub>D</sub>	85	A
	T <sub>C</sub> =100°C		60	
Pulsed Drain Current <sup>(Note3)</sup>		I <sub>DM</sub>	340	A
Total Power Dissipation <sup>(Note4)</sup>		P <sub>D</sub>	75	W
Single Pulsed Avalanche Energy <sup>(Note 5)</sup>		E <sub>AS</sub>	81	mJ

Note:

- Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ\text{C}$ .
- Repetitive rating; pulse width limited by max. junction temperature.
- $P_D$  is based on max. junction temperature, using junction-case thermal resistance.
- $T_J = 25^\circ\text{C}$ ,  $V_{DD} = 50\text{V}$ ,  $V_G = 10\text{V}$ ,  $L = 0.5\text{mH}$ .

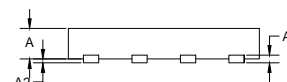
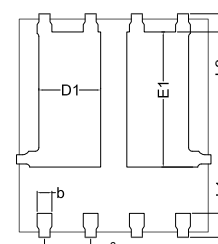
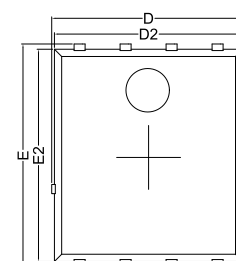
## Internal Structure and Marking Code



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

# Dual N-CHANNEL MOSFET

## PDFN5060-8D



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
D	0.203	0.218	5.15	5.55	
D2	0.197	0.213	5.00	5.40	
E	0.234	0.250	5.95	6.35	
E2	0.223	0.238	5.66	6.06	
A	0.039	0.047	1.00	1.20	
A1	0.010		0.254		BSC
A2	0.000	0.004	0.00	0.10	
D1	0.059	0.075	1.50	1.90	
E1	0.139	0.154	3.52	3.92	
L1	0.022	0.030	0.56	0.76	
L2	0.019		0.50		BSC
b	0.012	0.020	0.31	0.51	
e	0.050		1.27		BSC

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	40			V
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =40V, V <sub>GS</sub> =0V			1	μA
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.2	3.0	3.8	V
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		3.9	5	mΩ
Gate Resistance	R <sub>G</sub>	f=1MHz, Open drain		3		Ω
Diode Characteristics						
Continuous Body Diode Current	I <sub>S</sub>				85	A
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =20A			1.2	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =20A,di/dt=100A/μs		25		ns
Reverse Recovery Charge	Q <sub>rr</sub>			16		nC
Dynamic Characteristics						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =20V,V <sub>GS</sub> =0V,f=1MHz		1745		pF
Output Capacitance	C <sub>oss</sub>			580		
Reverse Transfer Capacitance	C <sub>rss</sub>			18		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =20V,V <sub>GS</sub> =10V,I <sub>D</sub> =20A		23		nC
Gate-Source Charge	Q <sub>gs</sub>			7.5		
Gate-Drain Charge	Q <sub>gd</sub>			3		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =20V, V <sub>GS</sub> =10V, R <sub>G</sub> =2.7Ω, I <sub>D</sub> =20A		13		ns
Turn-On Rise Time	t <sub>r</sub>			61		
Turn-Off Delay Time	t <sub>d(off)</sub>			24		
Turn-Off Fall Time	t <sub>f</sub>			8.3		

## Curve Characteristics

Fig.1 - Typical Output Characteristics

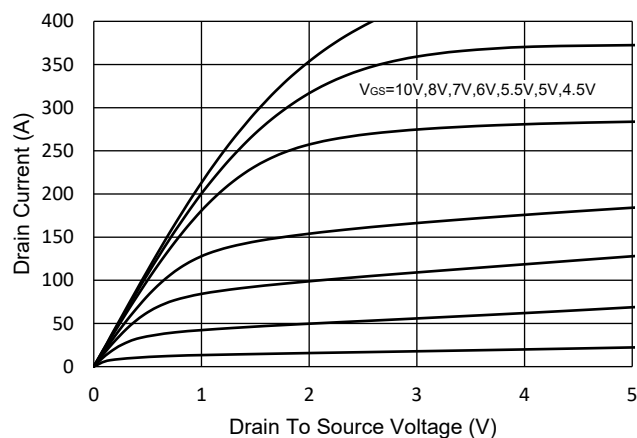


Fig.2 - Transfer Characteristic

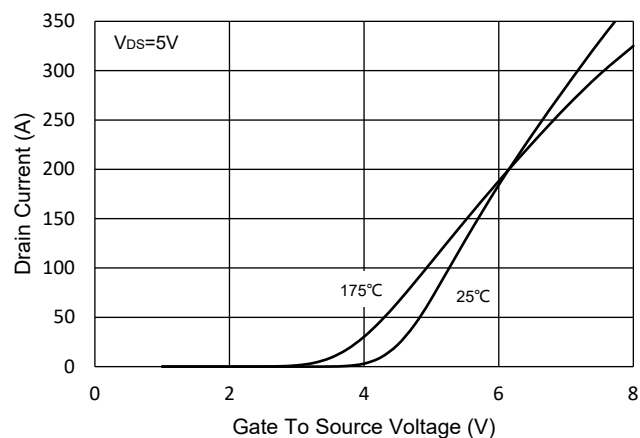


Fig. 3 -  $R_{DS(ON)} - V_{GS}$

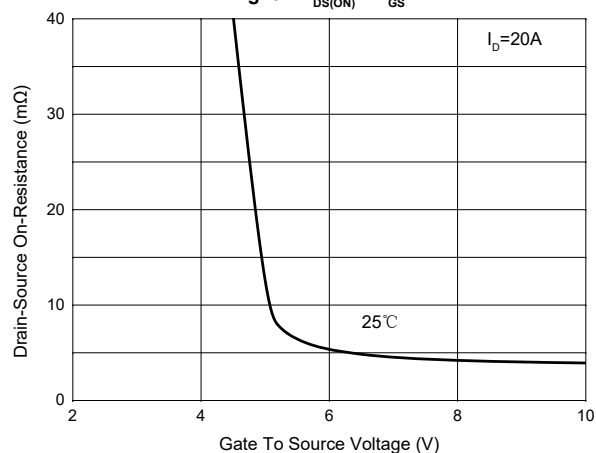


Fig.4 -  $R_{DS(ON)} - I_D$

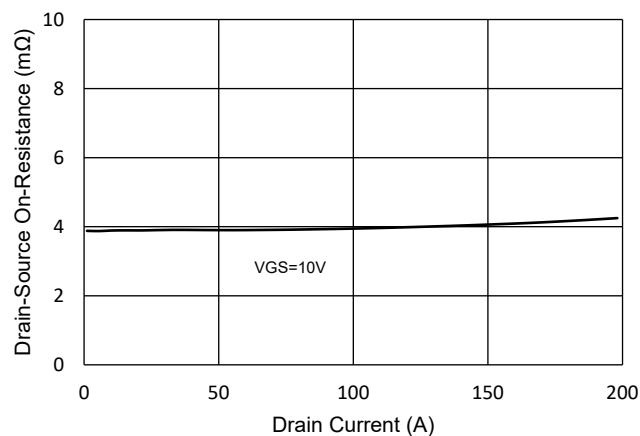


Fig.5 - Capacitance Characteristics

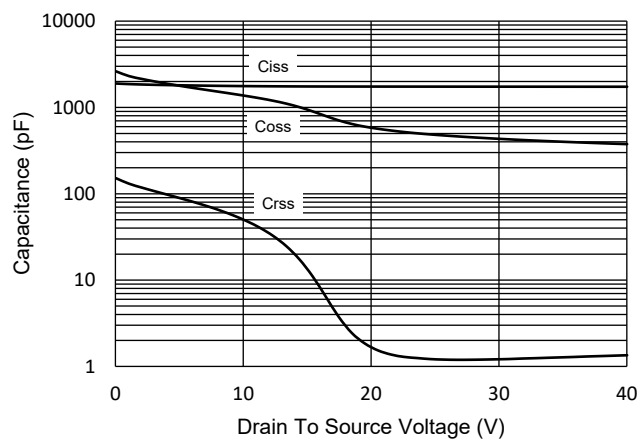
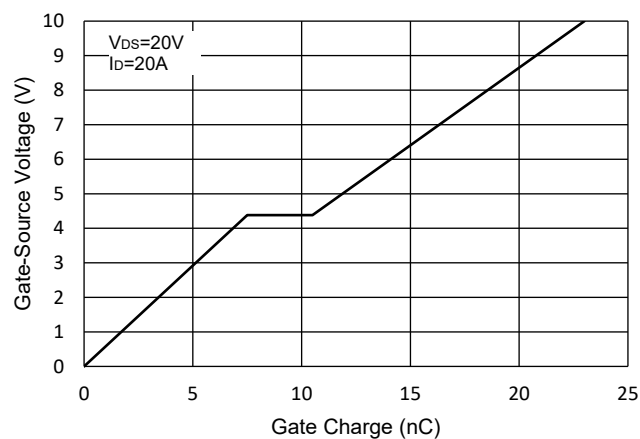


Fig.6 - Gate Charge



## Curve Characteristics

Fig.7 - Normalized Threshold Voltage

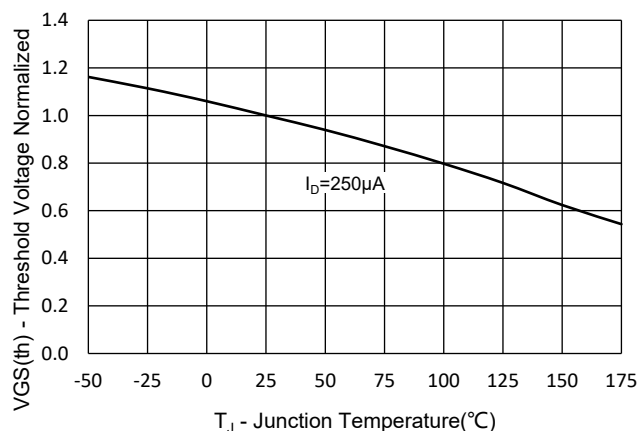


Fig.8 - Normalized On Resistance Characteristics

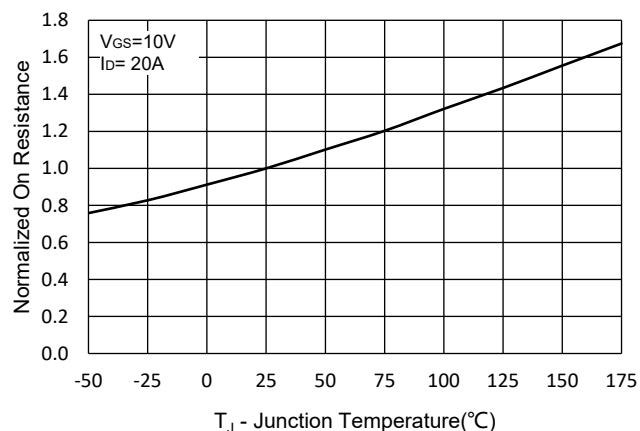


Fig.9 -  $I_S - V_{SD}$

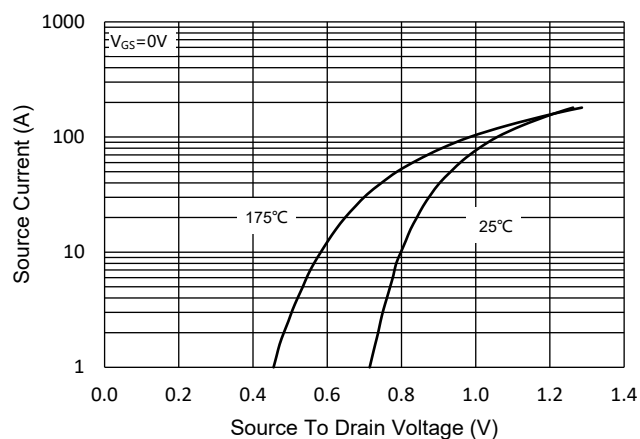


Fig.10 - Drain Current

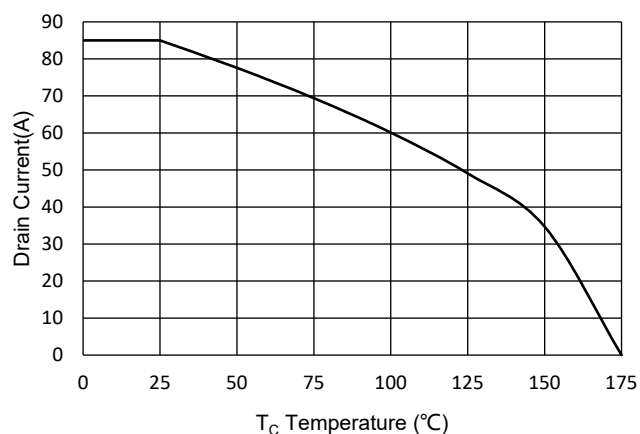
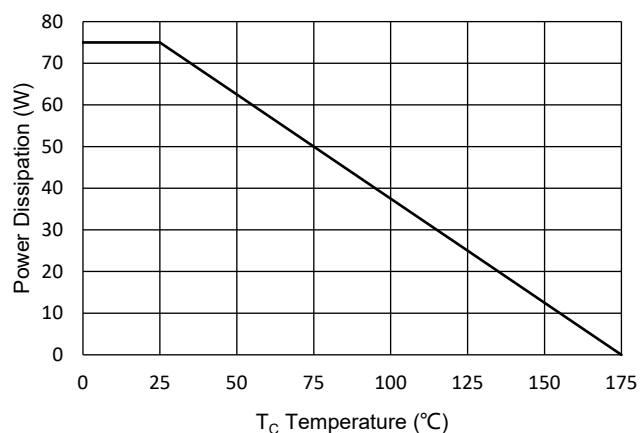


Fig.11 - PD Dissipation



## Curve Characteristics

Fig.12 - Safe Operation Area

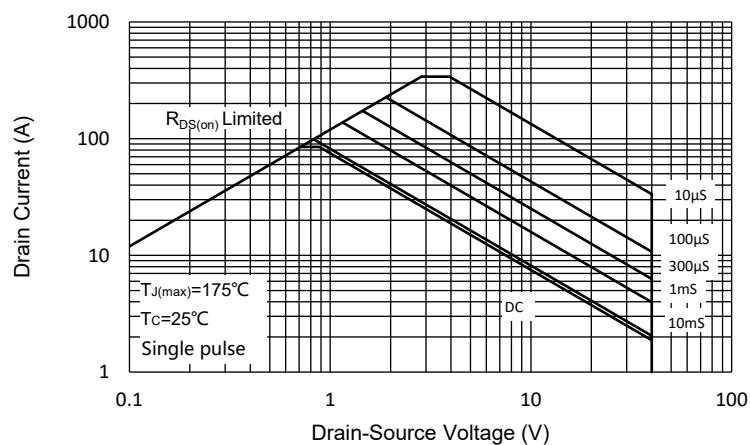
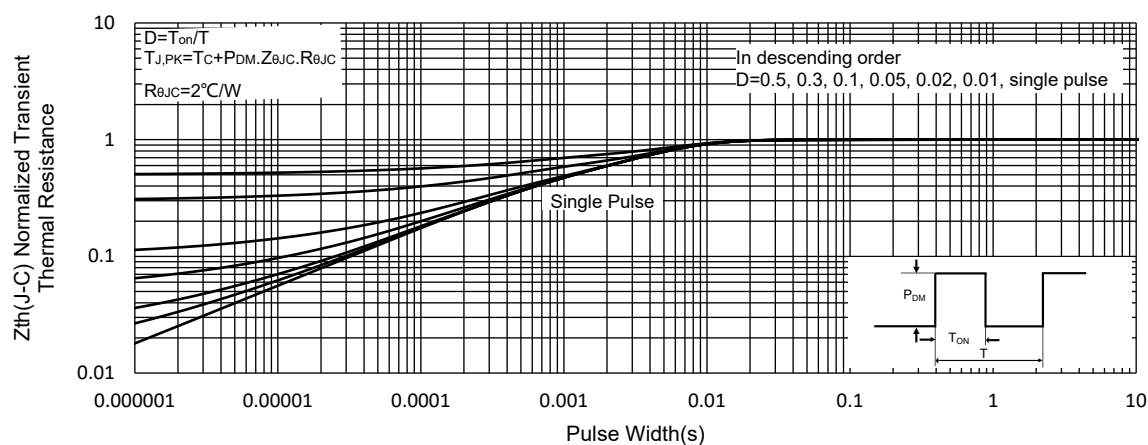


Fig.13 - Normalized Transient Thermal Impedance



## Ordering Information

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

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