

**Features**

- Split Gate Trench MOSFET Technology
- Very Low On-Resistance RDS(ON)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note 1)
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

**Maximum Ratings**

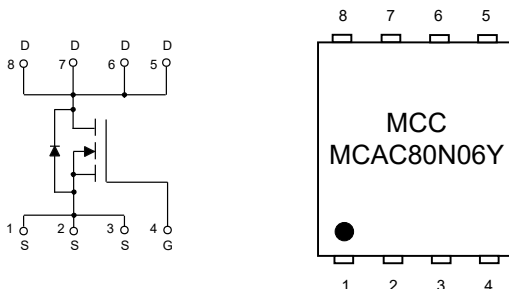
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 45°C/W Junction to Ambient(Steady-State)(Note 2)
- Thermal Resistance: 1.47°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V <sub>DS</sub>	60	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	T <sub>C</sub> =25°C	80 A
		T <sub>C</sub> =100°C	50 A
Pulsed Drain Current (Note 3)	I <sub>DM</sub>	320	A
Total Power Dissipation (Note 4)	P <sub>D</sub>	85	W
Single Pulse Avalanche Energy (Note 5)	E <sub>AS</sub>	400	mJ

Note:

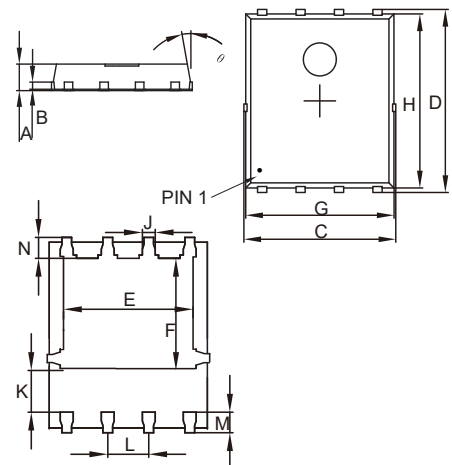
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of R<sub>θJA</sub> is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25°C. The Power dissipation P<sub>DSM</sub> is based on R<sub>θJA</sub> t ≤ 10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. P<sub>D</sub> is based on max. junction temperature, using junction-case thermal resistance.
5. T<sub>J</sub>=25°C, V<sub>DD</sub>=40V, V<sub>G</sub>=10V, L=2mH.

**Internal Structure and Marking Code**



**N-CHANNEL MOSFET**

**DFN5060**



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.031	0.047	0.80	1.20	
B	0.010		0.254		TYP.
C	0.193	0.222	4.90	5.64	
D	0.232	0.250	5.90	6.35	
E	0.148	0.167	3.75	4.25	
F	0.126	0.154	3.20	3.92	
G	0.189	0.213	4.80	5.40	
H	0.222	0.239	5.65	6.06	
K	0.045	0.059	1.15	1.50	
J	0.012	0.020	0.30	0.50	
L	0.046	0.054	1.17	1.37	
M	0.012	0.028	0.30	0.71	
N	0.016	0.028	0.40	0.71	

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	65		V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$			1	$\mu A$
		$V_{DS}=60V, V_{GS}=0V, T_J=55^\circ C$			5	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.7	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		3.0	4.2	m $\Omega$
		$V_{GS}=4.5V, I_D=10A$		3.9	5.2	
Gate Resistance	$R_g$	$V_{DS}=0V, V_{GS}=0V, f=1MHz$		0.8		$\Omega$
<b>Dynamic Characteristics</b>						
Continuous Body Diode Current	$I_S$				80	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=20A$		0.85	1.3	V
Reverse Recovery Charge	$Q_{rr}$	$I_F=I_S, di/dt=100A/\mu s$		58		nC
Reverse Recovery Time	$t_{rr}$			52		ns
<b>Switching Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=30V, V_{GS}=0V, f=1MHz$		3783		pF
Output Capacitance	$C_{oss}$			810		
Reverse Transfer Capacitance	$C_{riss}$			26		
Total Gate Charge	$Q_g$	$V_{DS}=30V, V_{GS}=4.5V, I_D=40A$		30		nC
Total Gate Charge	$Q_g$	$V_{DS}=30V, V_{GS}=10V, I_D=40A$		62		
Gate-Source Charge	$Q_{gs}$			9.6		
Gate-Drain Charge	$Q_{gd}$			11		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=15V, R_L=2.5\Omega, R_{GEN}=3\Omega, I_D=6A$		13.4		ns
Turn-On Rise Time	$t_r$			12		
Turn-Off Delay Time	$t_{d(off)}$			46		
Turn-Off Fall Time	$t_f$			12		

**Curve Characteristics**

Fig. 1 - Typical Output Characteristics

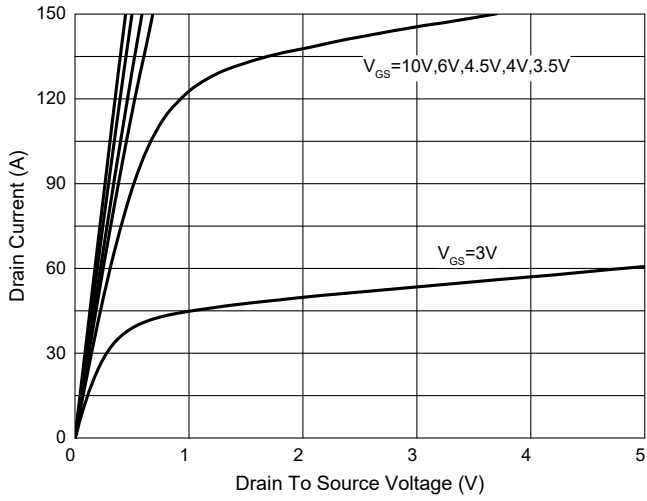


Fig. 2 - Transfer Characteristics

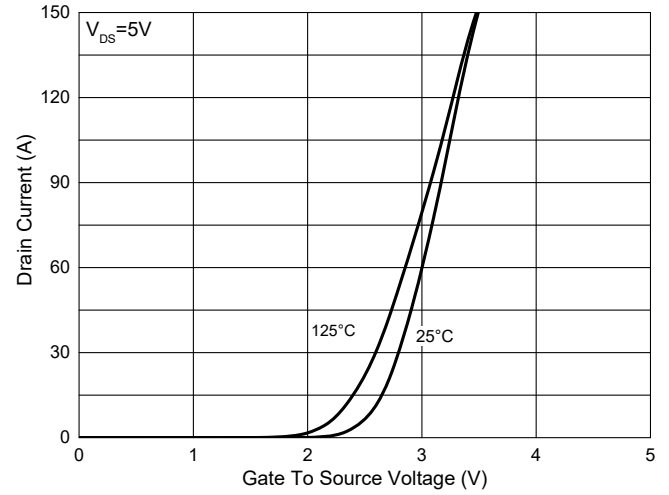


Fig. 3 -  $R_{DS(ON)} - V_{GS}$

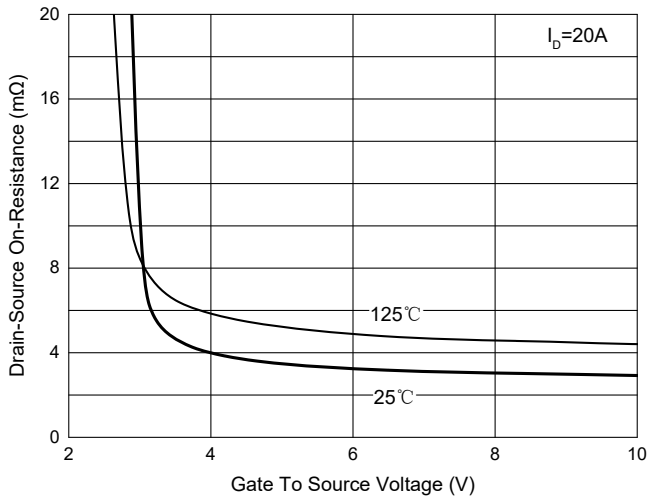


Fig. 4 -  $R_{DS(ON)} - I_D$

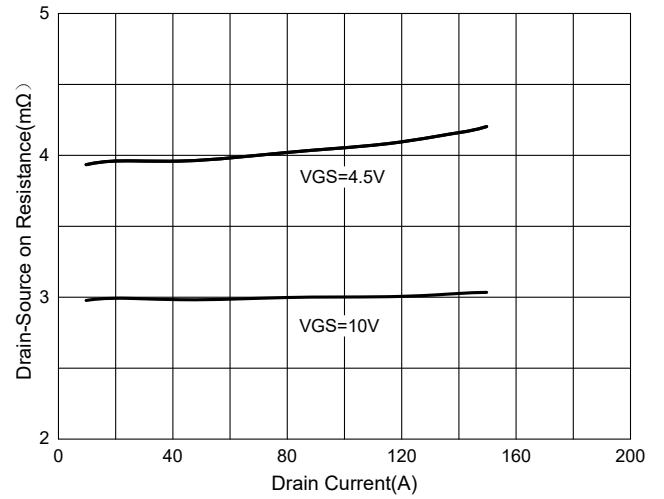


Fig. 5 - Capacitance Characteristics

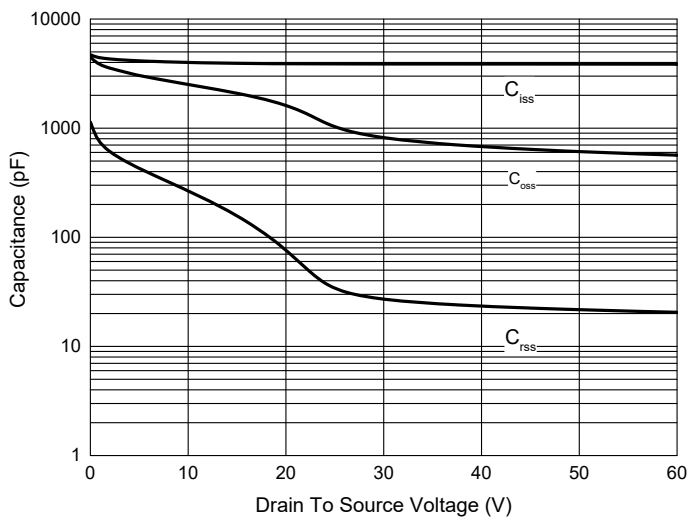
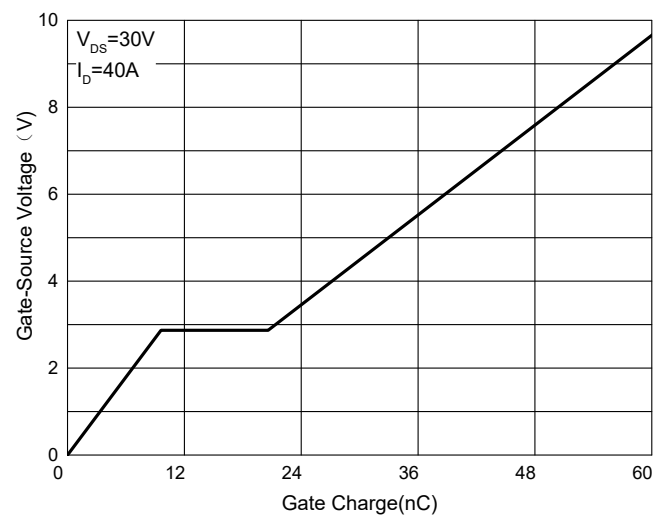


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - Normalized Threshold voltage

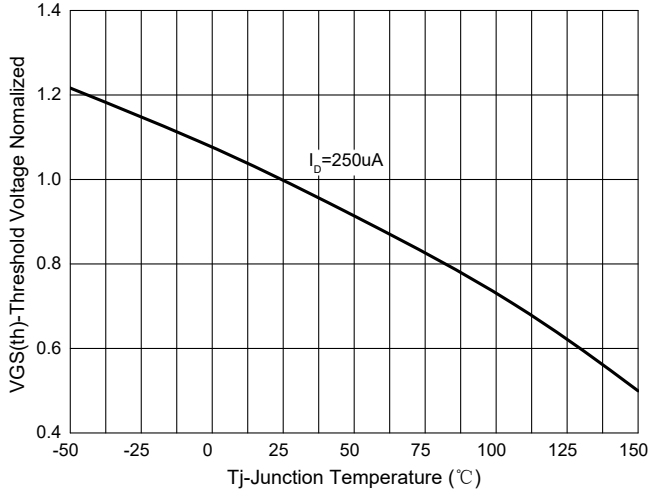


Fig.8-Normalized On Resistance Characteristics

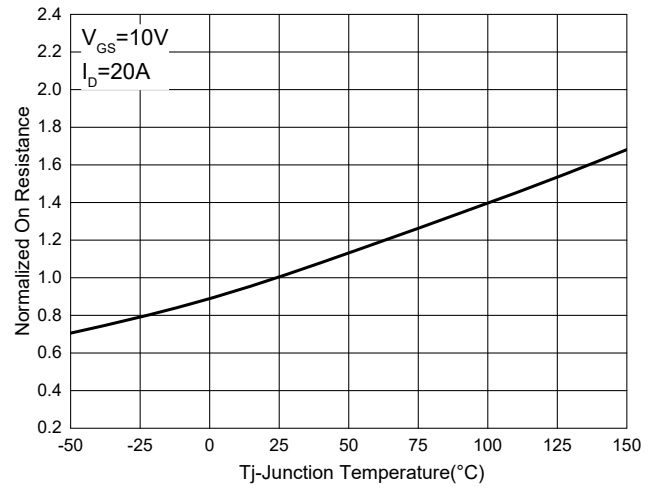


Fig.9 -  $I_S - V_{SD}$

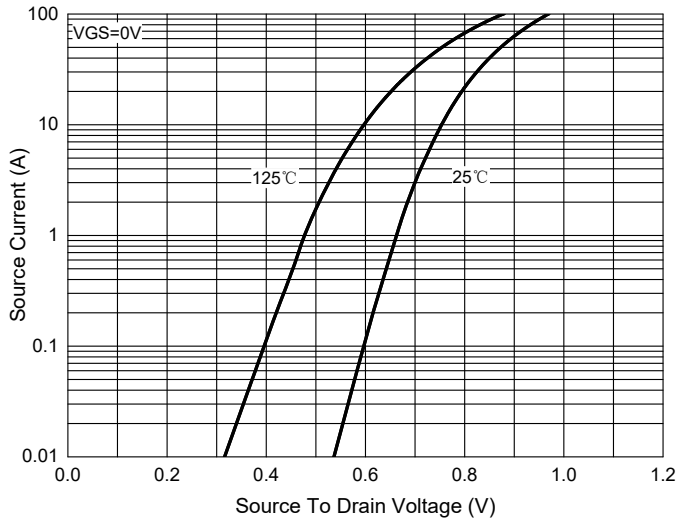


Fig. 10 - Drain Current

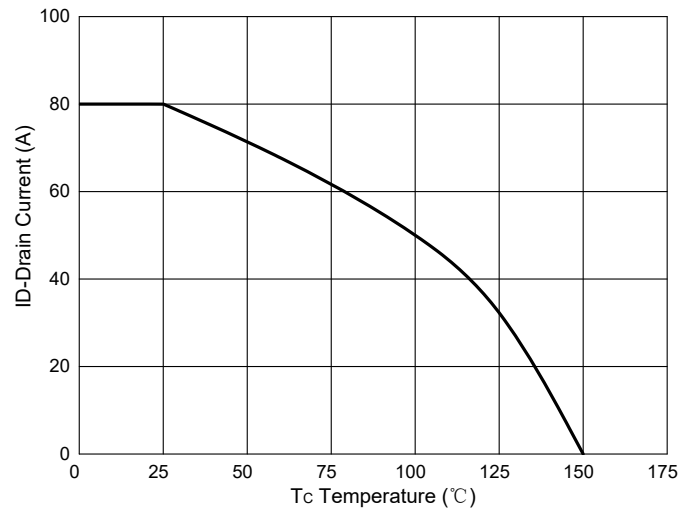
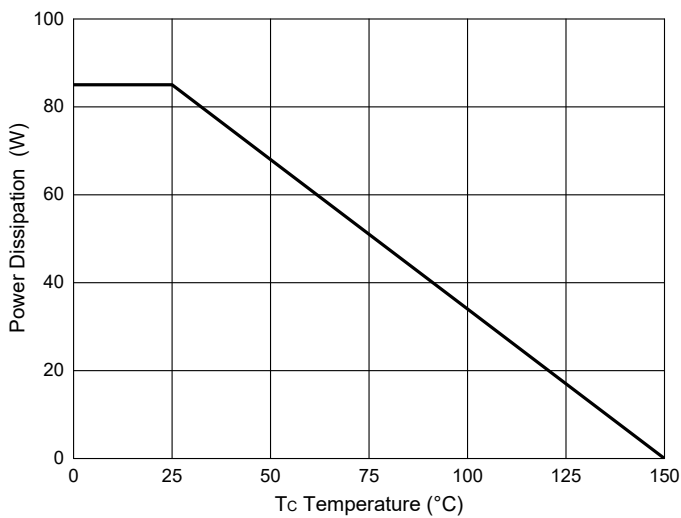


Fig.11-PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

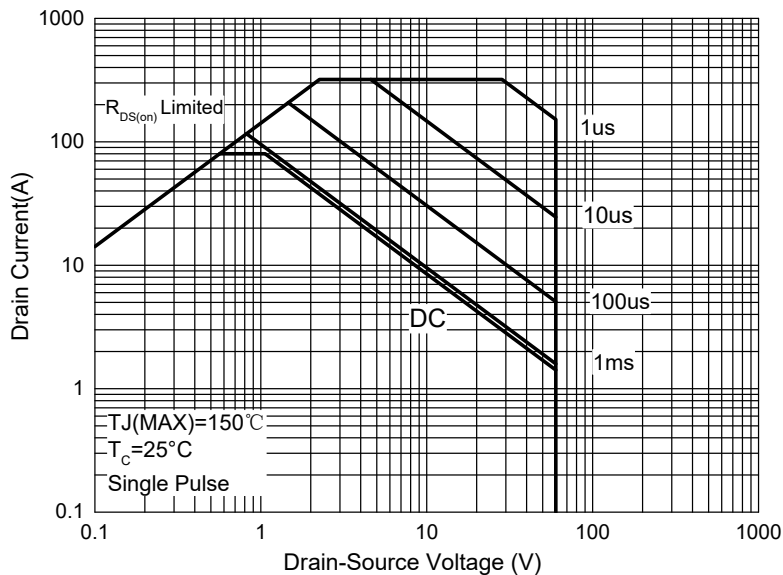
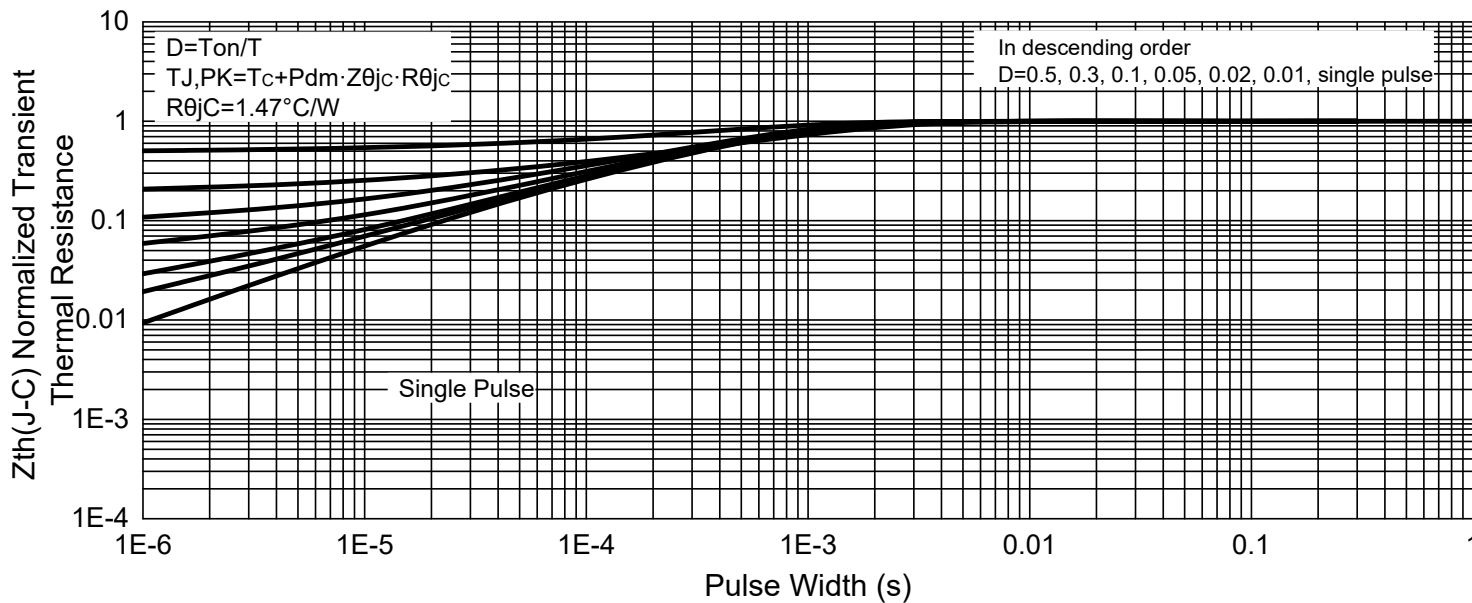


Fig. 13 - Normalized Transient Thermal Impedance



## Ordering Information

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

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