

**Features**

- AEC-Q101 Qualified
- Split Gate Trench MOSFET Technology
- Excellent Package For Heat Dissipation
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

**Maximum Ratings**

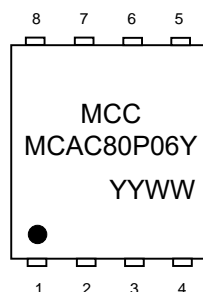
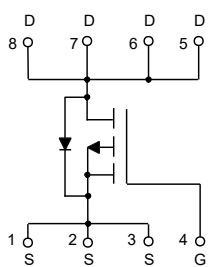
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 50°C/W Junction to Ambient (Note2)
- Thermal Resistance: 1.04°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-60	V
Gate-Source Voltage	$V_{GS}$	±18	V
Continuous Drain Current	$I_D$	$T_C=25^\circ C$	-80
		$T_C=100^\circ C$	-50
Pulsed Drain Current (Note3)	$I_{DM}$	-320	A
Total Power Dissipation (Note4)	$P_D$	120	W
Single Pulsed Avalanche Energy (Note5)	$E_{AS}$	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  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ C$ .
3. Pulse Test: Pulse Width≤300us, Duty cycle ≤2%.
4. Pd is based on max. junction temperature, using junction-case thermal resistance.
5.  $T_j=25^\circ C, V_{DD}=-40V, V_{GS}=-10V, R_G=25\Omega, L=2mH, I_{AS}=-20A$ .

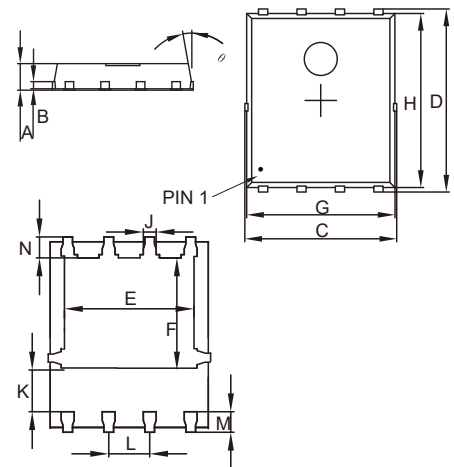
**Internal Structure and Marking Code**



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

**P-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			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 18V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-60V, V_{GS}=0V$			-1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-2	-2.6	-4	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-20A$		6.1	8.0	m $\Omega$
Gate Resistance	$R_g$	Drain open, f=1MHz		8		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				-80	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-20A$			-1.3	V
Reverse Recovery Time	$t_{rr}$	$I_S=-20A, di/dt=100A/\mu s$		57		ns
Reverse Recovery Charge	$Q_{rr}$			82		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-30V, V_{GS}=0V, f=1MHz$		5300		pF
Output Capacitance	$C_{oss}$			960		
Reverse Transfer Capacitance	$C_{rss}$			36		
Total Gate Charge	$Q_g$	$V_{DS}=-30V, V_{GS}=-10V, I_D=-20A$		81		nC
Gate-Source Charge	$Q_{gs}$			19		
Gate-Drain Charge	$Q_{gd}$			18		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-30V, V_{GS}=-10V, R_G=1.6\Omega, I_D=-20A$		13.2		ns
Turn-On Rise Time	$t_r$			26		
Turn-Off Delay Time	$t_{d(off)}$			134.1		
Turn-Off Fall Time	$t_f$			58.9		

**Curve Characteristics**

Fig. 1 - Typical Output Characteristics

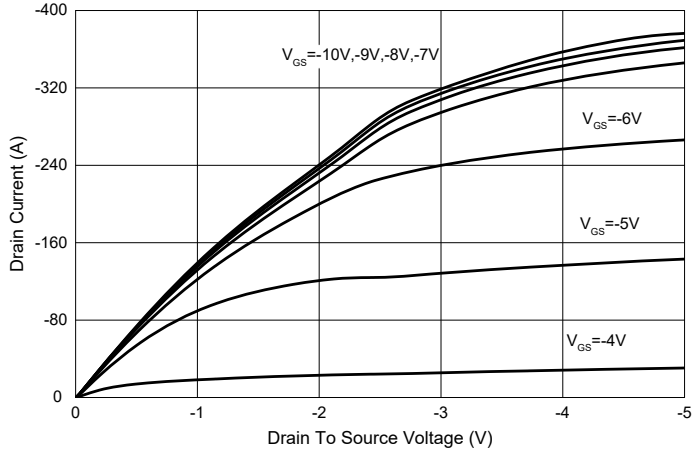


Fig. 2 - Transfer Characteristics

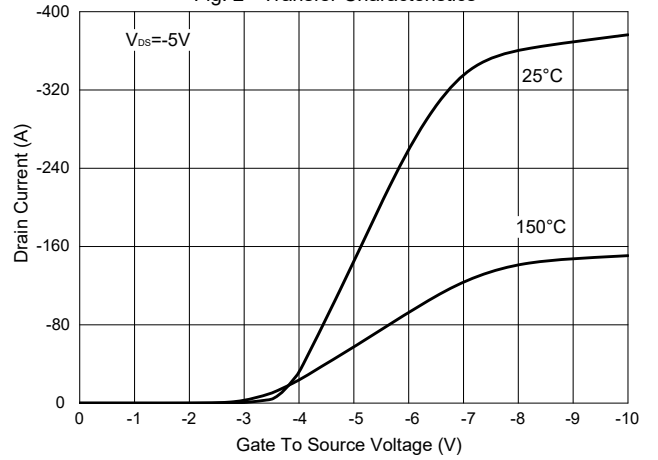


Fig. 3 -  $R_{DS(ON)} - V_{GS}$

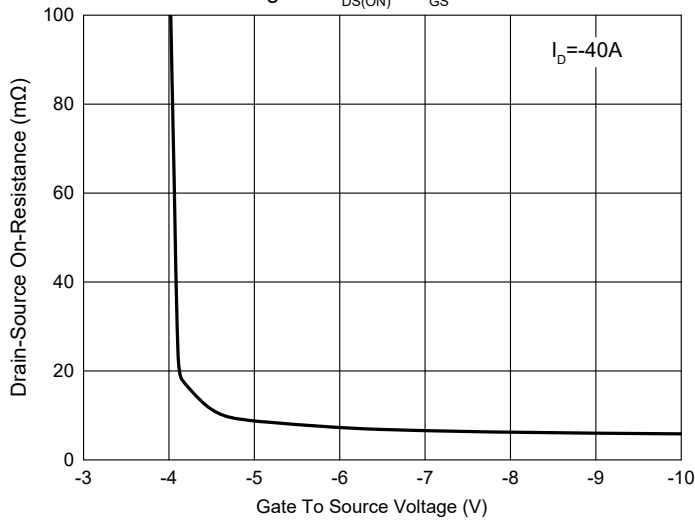


Fig. 4 -  $R_{DS(ON)} - I_D$

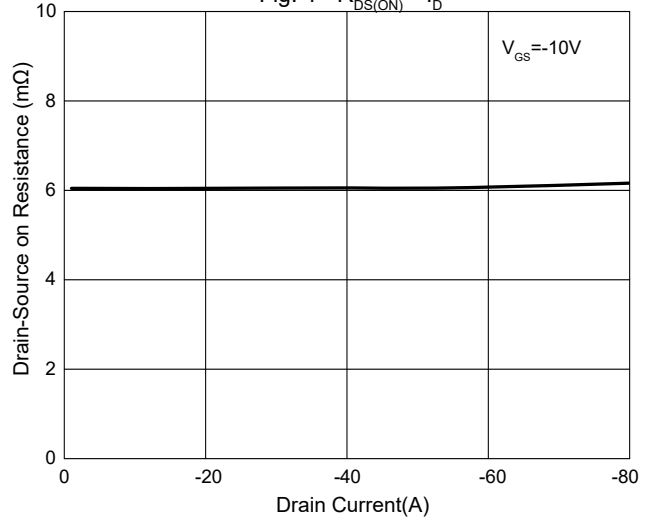


Fig. 5 - Capacitance Characteristics

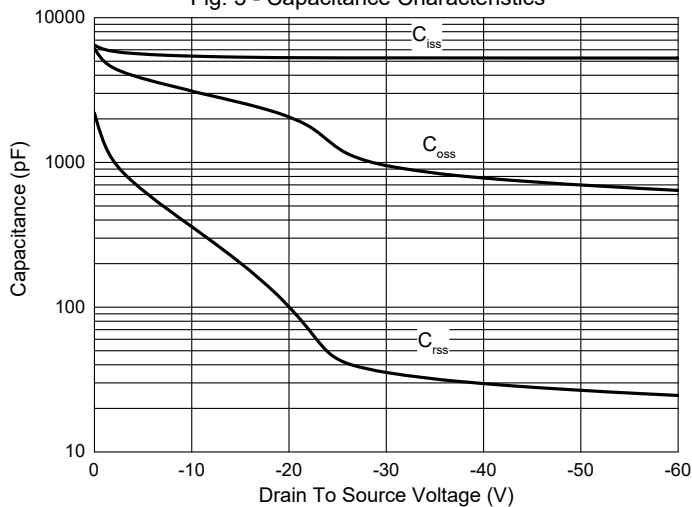
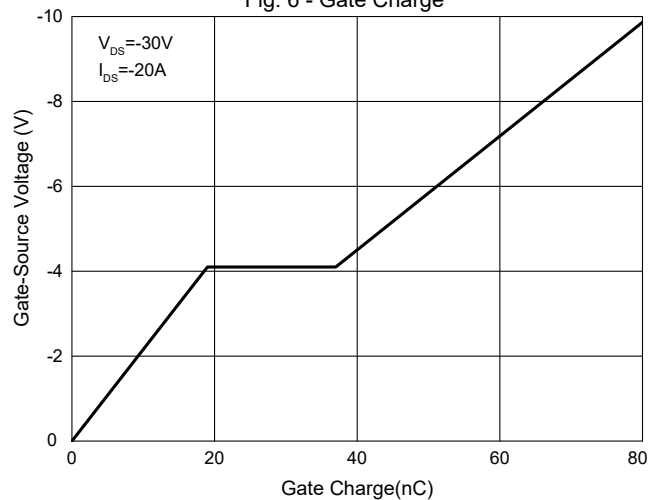


Fig. 6 - Gate Charge



**Curve Characteristics**

Fig. 7 - Normalized Threshold Voltage

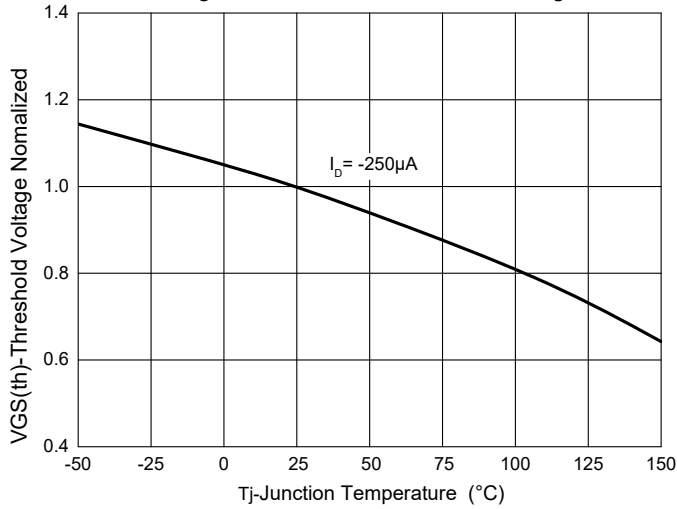


Fig. 8 - Normalized On Resistance Characteristics

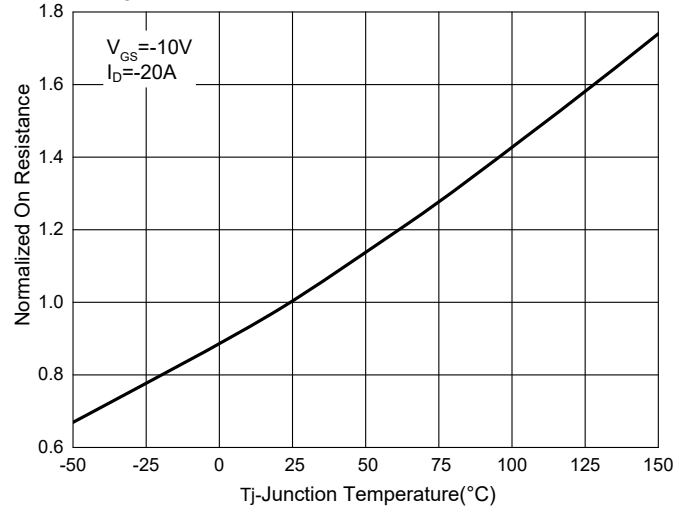


Fig. 9 -  $I_S - V_{SD}$

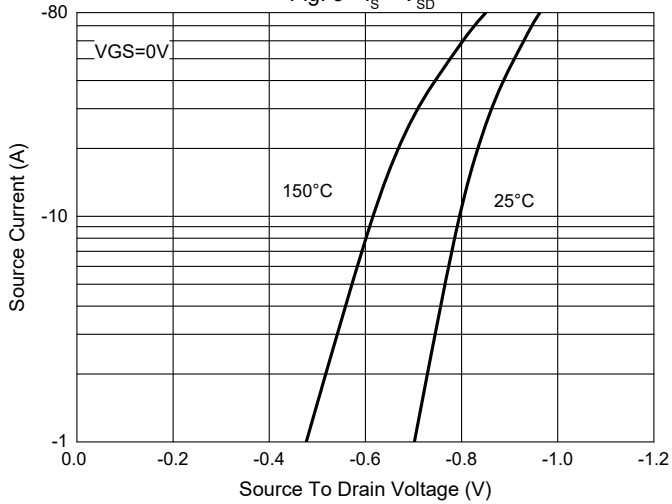


Fig. 10 - Drain Current

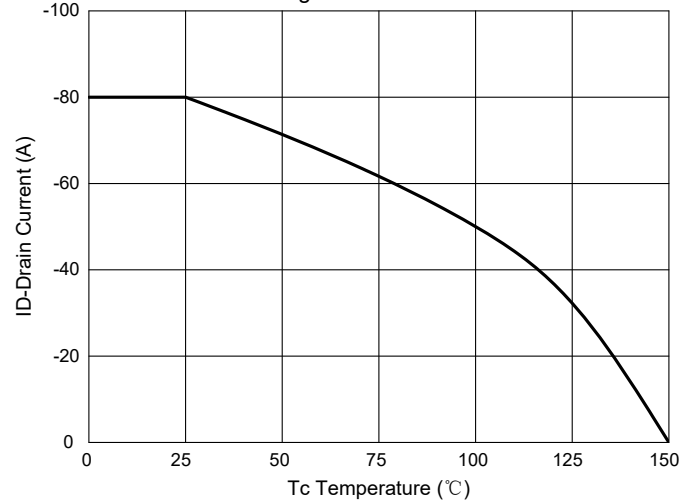
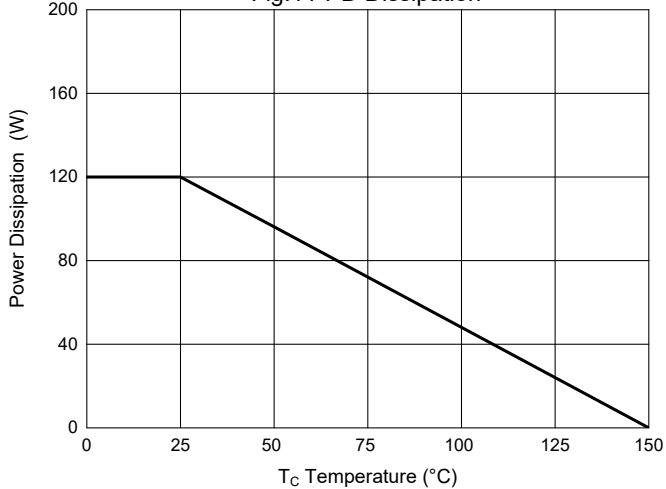


Fig.11-PD Dissipation



**Curve Characteristics**

Fig. 12 - Safe Operation Area

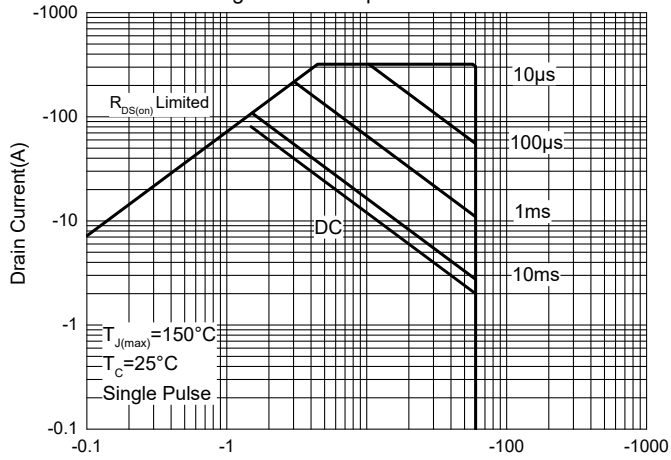
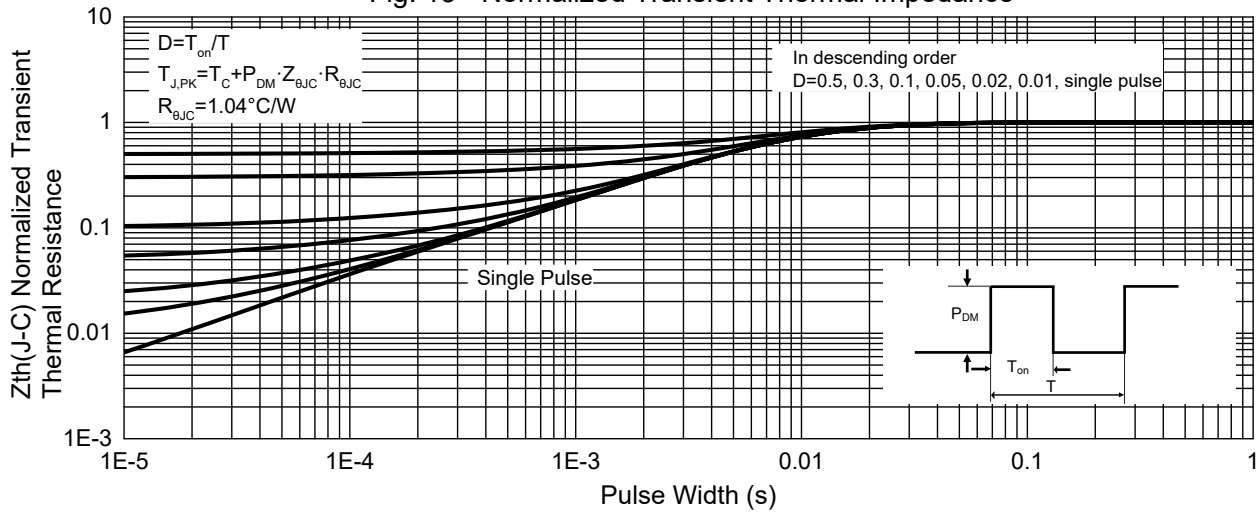


Fig. 13 - Normalized Transient Thermal Impedance



## Ordering Information

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

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