

**Features**

- Split Gate Trench Power MV MOSFET Technology
- Low Gate Charge
- 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**

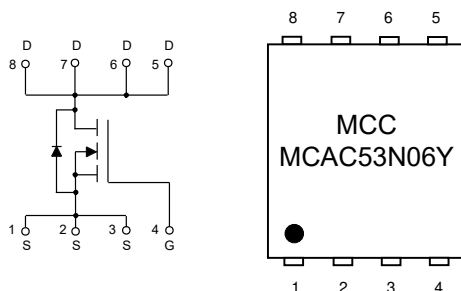
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 17°C/W Junction to Ambient( $t \leq 10s$ )<sup>(Note 2)</sup>
- Thermal Resistance: 55°C/W Junction to Ambient(Steady-State)<sup>(Note2,3)</sup>
- Thermal Resistance: 1.8°C/W Junction to Case(Steady-State)

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DS}$	60	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V	
Continuous Drain Current <sup>(Note 4)</sup>	$I_D$	$T_C=25^\circ C$	53	A
		$T_C=100^\circ C$	34	A
Pulsed Drain Current <sup>(Note 5)</sup>	$I_{DM}$	110	A	
Single Pulse Avalanche Energy <sup>(Note 5)</sup>	$E_{AS}$	195	mJ	
Total Power Dissipation <sup>(Note 2)</sup>	$P_D$	$T_C=25^\circ C$	70	W
		$T_C=100^\circ C$	28	W

**Note:**

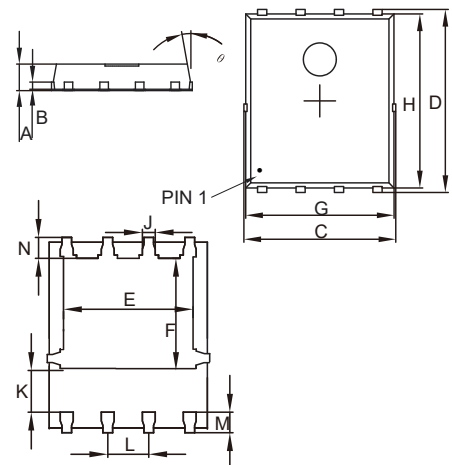
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The Value of  $R_{\theta JA}$  is Measured with the Device Mounted on 1in<sup>2</sup> FR - 4 Board with 2oz. Copper, in a Still Air Environment with  $T_A = 25^\circ C$ . The Power Dissipation  $P_{DSM}$  is Based on  $R_{\theta JA}$   $t \leq 10s$  and the Maximum Allowed Junction Temperature of 150°C. The Value in Any Given Application Depends on the User's Specific Board Design.
3. The  $R_{\theta JA}$  is the Sum of the Thermal Impedance from Junction to Case  $R_{\theta JC}$  and Case to Ambient.
4. The Maximum Current Rating is Package Limited.
5. Single Pulse Width Limited by Junction Temperature  $T_{J(MAX)} = 175^\circ C$ .

**Internal Structure and Marking Code**



**N-CHANNEL MOSFET**

**DFN5060**



**DIMENSIONS**

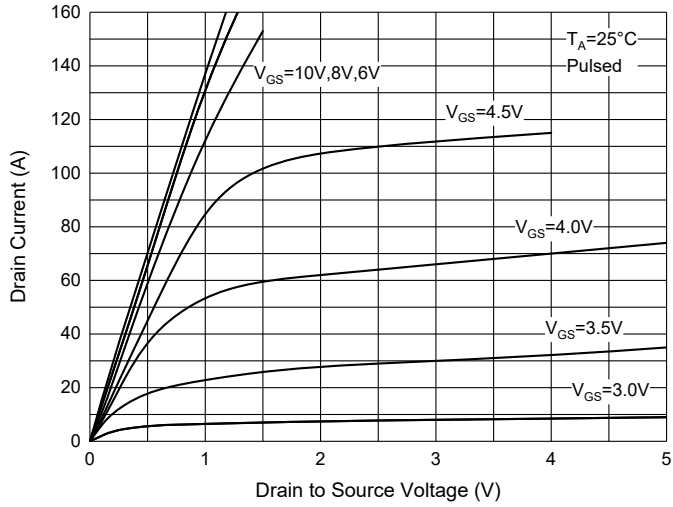
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.031	0.047	0.80	1.20	
B	0.010		0.254		TYP.
C	0.193	0.222	4.90	5.64	
D	0.232	0.250	5.90	6.35	
E	0.148	0.167	3.75	4.25	
F	0.126	0.154	3.20	3.92	
G	0.189	0.213	4.80	5.40	
H	0.222	0.239	5.65	6.06	
K	0.045	0.059	1.15	1.50	
J	0.012	0.020	0.30	0.50	
L	0.046	0.054	1.17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

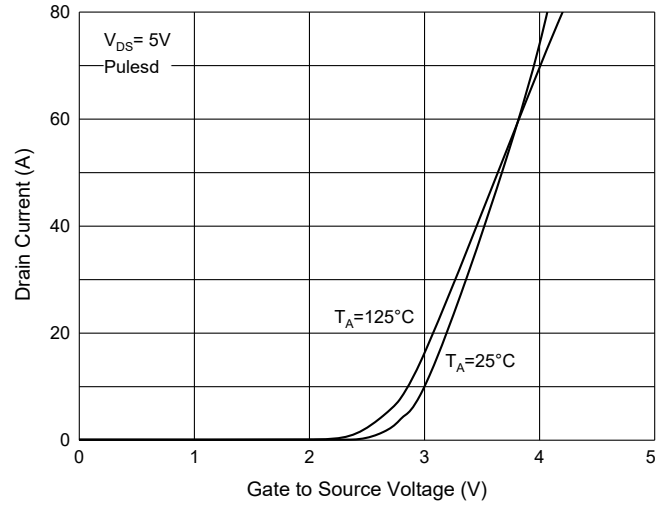
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	65		V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$			1	$\mu A$
		$V_{DS}=60V, V_{GS}=0V, T_J=55^\circ C$			5	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.1	1.7	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		5.3	7.5	m $\Omega$
		$V_{GS}=4.5V, I_D=10A$		6.9	9.5	
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=20A$	30			S
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=20A$		0.85	0.99	V
Continuous Body Diode Current	$I_S$				53	A
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=30V, V_{GS}=0V, f=1MHz$		1988		pF
Output Capacitance	$C_{oss}$			470		
Reverse Transfer Capacitance	$C_{rss}$			14		
Gate Resistance	$R_g$	$V_{DS}=0V, V_{GS}=0V, f=1MHz$		1.6		$\Omega$
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS}=30V, V_{GS}=4.5V, I_D=20A$		16		nC
Total Gate Charge	$Q_g$	$V_{DS}=30V, V_{GS}=10V, I_D=20A$		31		
Gate-Source Charge	$Q_{gs}$			6		
Gate-Drain Charge	$Q_{gd}$			5		
Reverse Recovery Charge	$Q_{rr}$	$I_S=20A, di/dt=500A/\mu s$		58		ns
Reverse Recovery Time	$t_{rr}$			17		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=15V, R_L=2.5\Omega, R_{GEN}=3\Omega$		10.5		
Turn-On Rise Time	$t_r$			4.5		
Turn-Off Delay Time	$t_{d(off)}$			29.5		
Turn-Off Fall Time	$t_f$			8		

**Curve Characteristics**

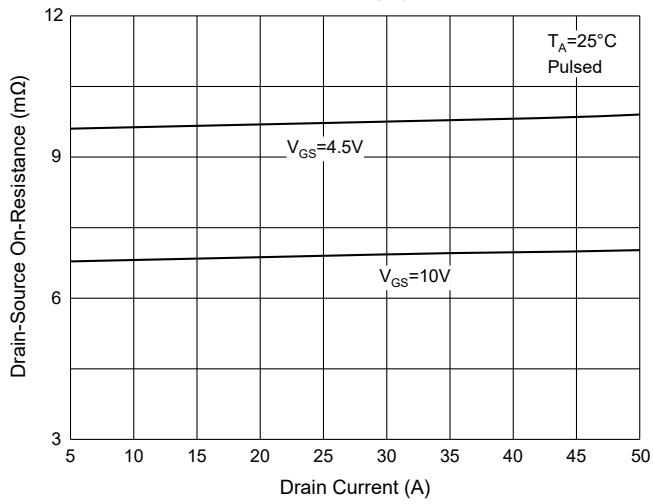
**Fig. 1 - Output Characteristics**



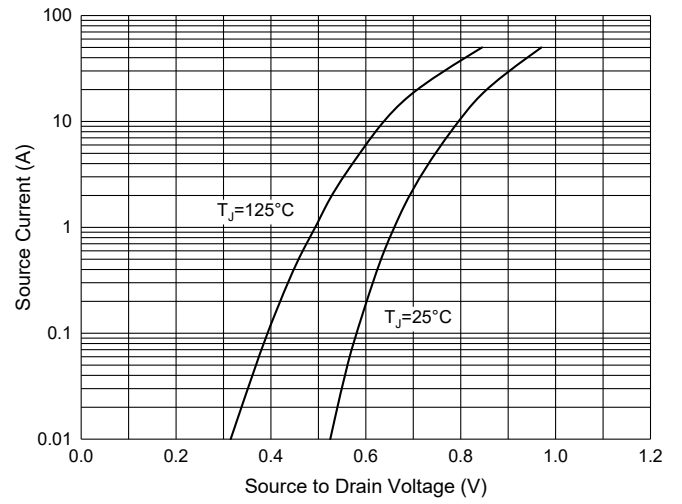
**Fig. 2 - Transfer Characteristics**



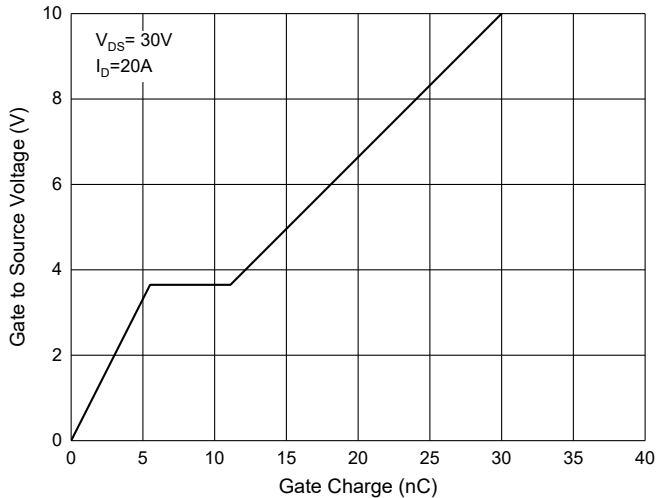
**Fig. 3 -  $R_{DS(ON)} - I_D$**



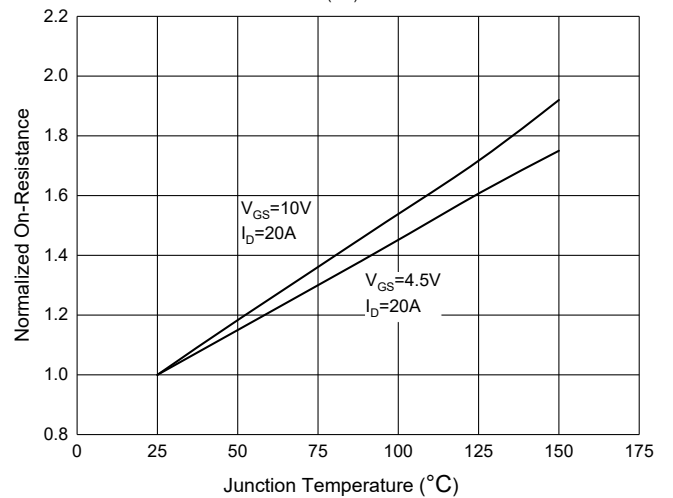
**Fig. 4 -  $I_S - V_{SD}$**



**Fig. 5 - Gate Charge**



**Fig. 6 -  $R_{DS(ON)} - \text{Temperature}$**



## Ordering Information

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

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