

## Features

- Split Gate Trench MOSFET Technology
- Excellent Package for Heat Dissipation
- High Density Cell Design for Low  $R_{DS(ON)}$
- 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)
- Moisture Sensitivity Level 1

## Maximum Ratings

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 20°C/W Junction to Ambient( $t \leq 10S$ )<sup>(2)</sup>
- Thermal Resistance: 50°C/W Junction to Ambient(Steady-State)<sup>(2)</sup>
- Thermal Resistance: 1.04°C/W Junction to Case(Steady-State)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	120	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	88	A
Pulsed Drain Current <sup>(3)</sup>	$I_{DM}$	352	A
Total Power Dissipation	$P_D$	120	W
Single Pulsed Avalanche Energy <sup>(4)</sup>	$E_{AS}$	400	mJ

Note:

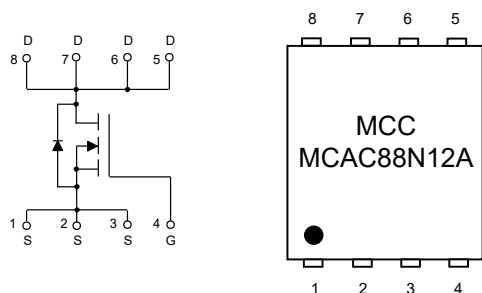
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

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  $T_A = 25^\circ C$ . 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. Repetitive rating; pulse width limited by max. junction temperature.

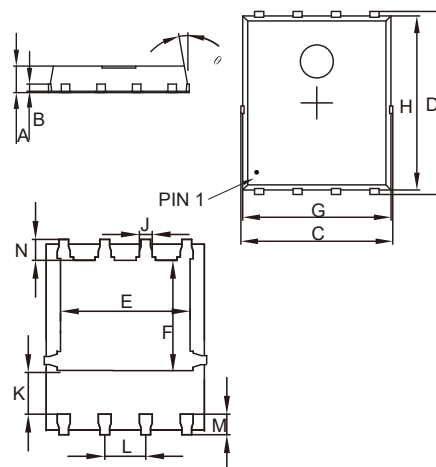
4.  $T_J = 25^\circ C$ ,  $V_{DD} = 50V$ ,  $R_G = 25\Omega$ ,  $L = 2mH$ .

## 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
Static Characteristics						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	120			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> =120V, 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	1	2	3	V
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		6.4	7.6	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A		7.6	9.6	
Gate Resistance	R <sub>G</sub>	f=1MHz, Open drain		0.9		Ω
Diode Characteristics						
Continuous Body Diode Current	I <sub>S</sub>				88	A
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =20A			1.3	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =20A, dI <sub>F</sub> /dt=100A/μs		77		ns
Reverse Recovery Charge	Q <sub>rr</sub>			151		nC
Dynamic Characteristics						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz		4249		pF
Output Capacitance	C <sub>oss</sub>			1381		
Reverse Transfer Capacitance	C <sub>rss</sub>			34		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =20A		71		nC
Gate-Source Charge	Q <sub>gs</sub>			17.4		
Gate-Drain Charge	Q <sub>gd</sub>			10.6		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DS</sub> =50V, V <sub>GEN</sub> =10V, R <sub>G</sub> =2.2Ω, I <sub>DS</sub> =20A		17.3		ns
Turn-On Rise Time	t <sub>r</sub>			35.9		
Turn-Off Delay Time	t <sub>d(off)</sub>			43.9		
Turn-Off Fall Time	t <sub>f</sub>			69.6		

## Curve Characteristics

Fig. 1 - Typical Output Characteristics

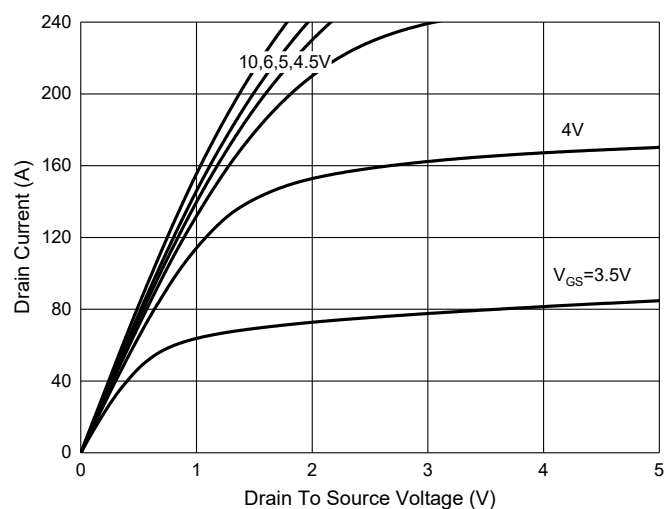


Fig. 2 - Transfer Characteristics

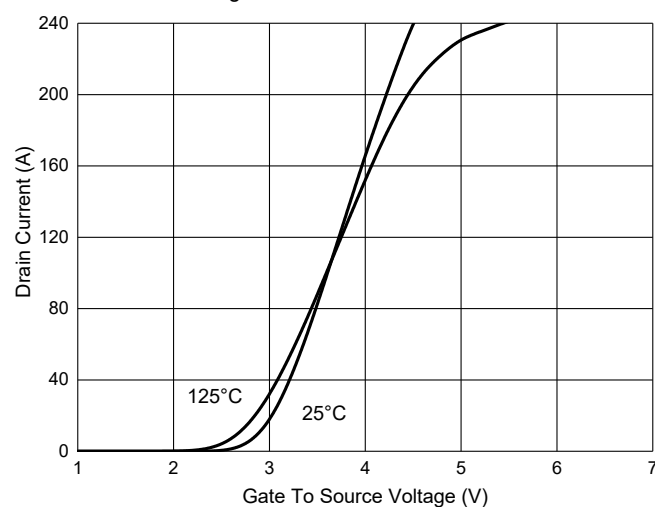


Fig. 3 -  $R_{DS(ON)}-V_{GS}$

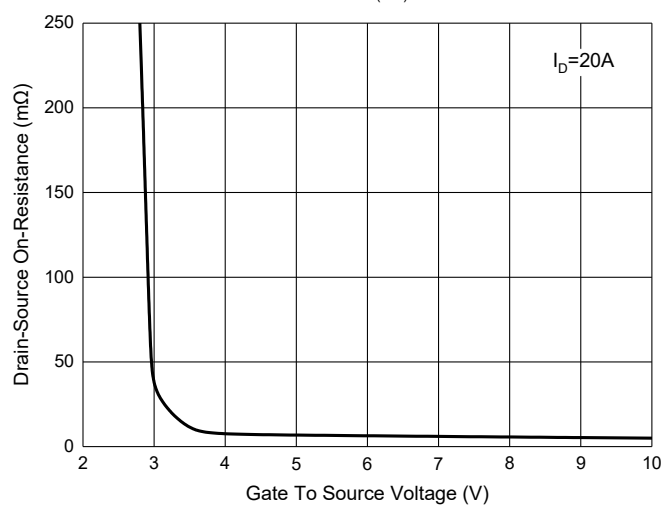


Fig. 4 - Normalized On Resistance Characteristics

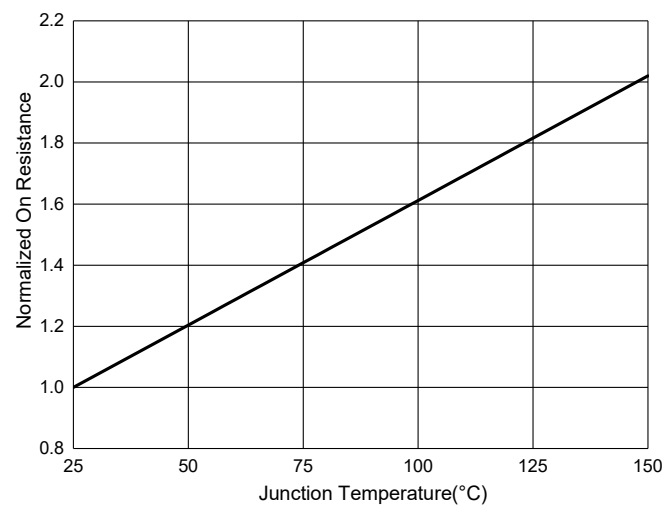


Fig. 5 - Capacitance Characteristics

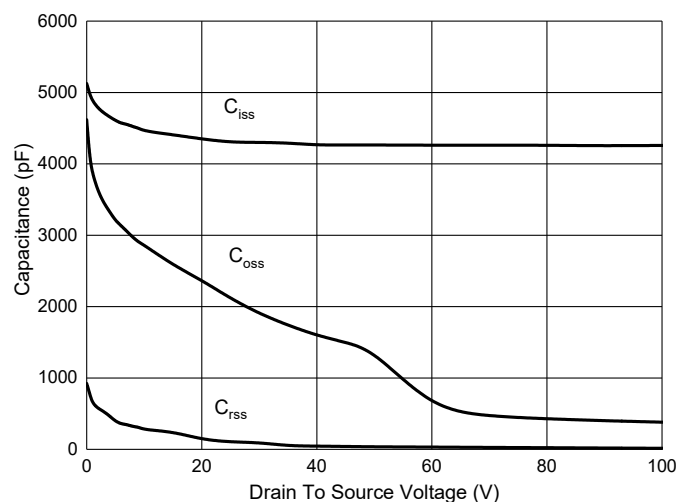
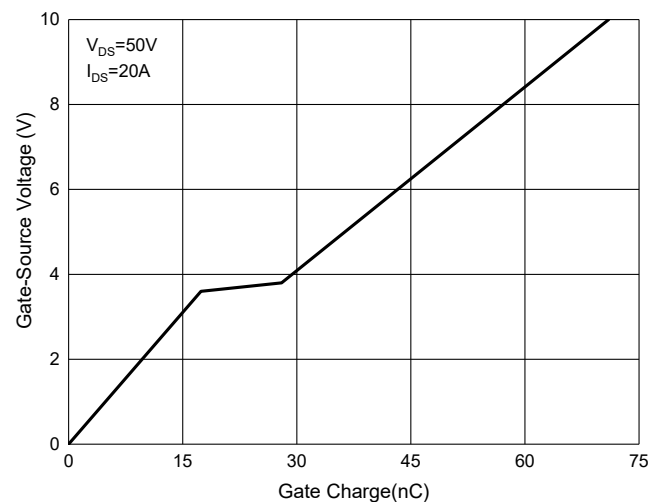
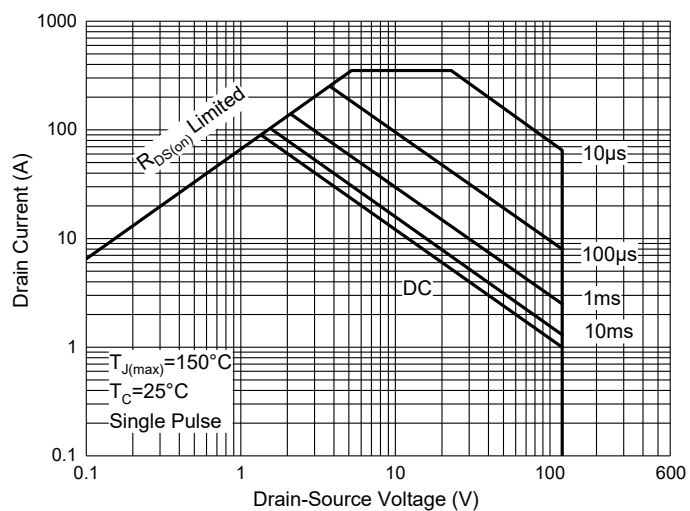


Fig. 6 - Gate Charge



## Curve Characteristics

Fig. 7 - Safe Operation Area



## Ordering Information

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

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