

### Features

- Split Gate Trench MOSFET Technology
- High Density Cell Design for Low  $R_{DS(on)}$
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free. "Green" Device (Note 1)
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)
- Moisture Sensitivity Level 1

### Maximum Ratings

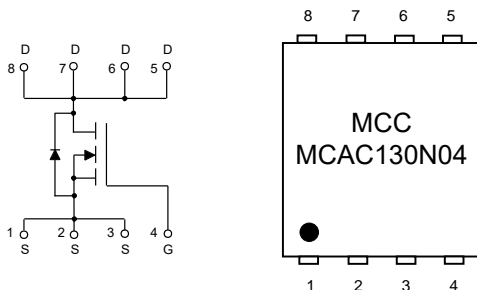
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 50°C/W Junction to Ambient (Note 2)
- Thermal Resistance: 1.08°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	40	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current (Note 3)	$I_D$	130	A
Pulsed Drain Current (Note 4)	$I_{DM}$	390	A
Single Pulse Avalanche Energy (Note 5)	$E_{AS}$	720	mJ
Total Power Dissipation (Note 6)	$P_D$	115	W

Notes:

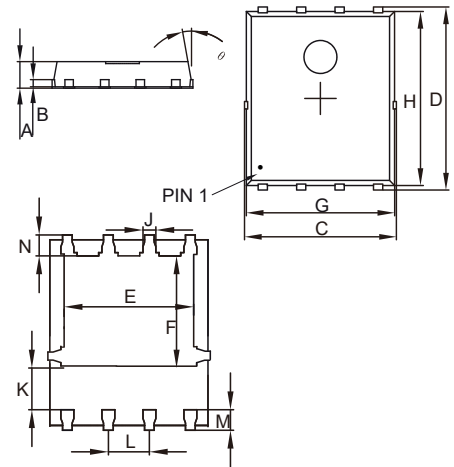
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The Value of  $R_{\theta JA}$  is Measured with the Device Mounted on 1 in<sup>2</sup> FR-4 Board with 2oz. Copper, in a Still Air Environment with  $T_A=25^\circ C$ .
3. Calculated Continuous Current Based on Maximum Allowable Junction Temperature.
4. Repetitive Rating; Pulse Width Limited by Max. Junction Temperature.
5.  $V_{DD}=25V$ ,  $R_G=25\Omega$ ,  $L=3mH$ , Starting  $T_J=25^\circ C$ .
6.  $P_d$  is Based on Max. Junction Temperature, Using Junction-Case Thermal Resistance.

### 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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	40			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=40V, V_{GS}=0V$			1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Gate-Threshold Voltage <sup>(Note7)</sup>	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.8	2.5	V
Drain-Source On-Resistance <sup>(Note7)</sup>	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		1.45	1.75	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$		1.9	2.5	
Diode Forward Voltage <sup>(Note7)</sup>	$V_{SD}$	$V_{GS}=0V, I_S=20A$			1.2	V
Maximum Body-Diode Continuous Current	$I_S$				130	A
Gate Resistance	$R_G$	f=1MHz, Open Drain		2.6		$\Omega$
<b>Dynamic Characteristics<sup>(Note8)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		7140		pF
Output Capacitance	$C_{oss}$			1909		
Reverse Transfer Capacitance	$C_{rss}$			53		
<b>Switching Characteristics<sup>(Note8)</sup></b>						
Total Gate Charge	$Q_g$	$V_{GS}=10V, V_{DS}=20V, I_D=20A$		135		nC
Gate-Source Charge	$Q_{gs}$			26.8		
Gate-Drain Charge	$Q_{gd}$			24.5		
Reverse Recovery Charge	$Q_{rr}$	$I_F=20A, di/dt=100A/\mu s$		65.7		ns
Reverse Recovery Time	$t_{rr}$			59		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=20V, I_{DS}=20A, R_{GEN}=2.2\Omega$		22.5		ns
Turn-On Rise Time	$t_r$			86		
Turn-Off Delay Time	$t_{d(off)}$			114.2		
Turn-Off Fall Time	$t_f$			97		

Notes:

 7. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$ .

8. Guaranteed by Design, Not Subject to Production Testing.

**Curve Characteristics**

Fig. 1 - Output Characteristics

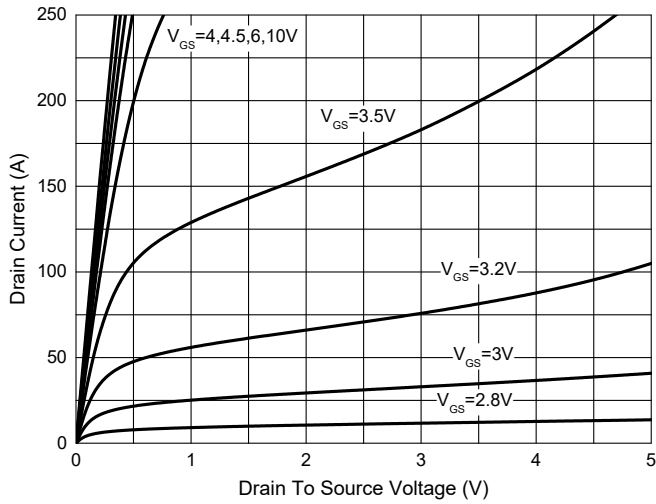


Fig. 2 - Transfer Characteristics

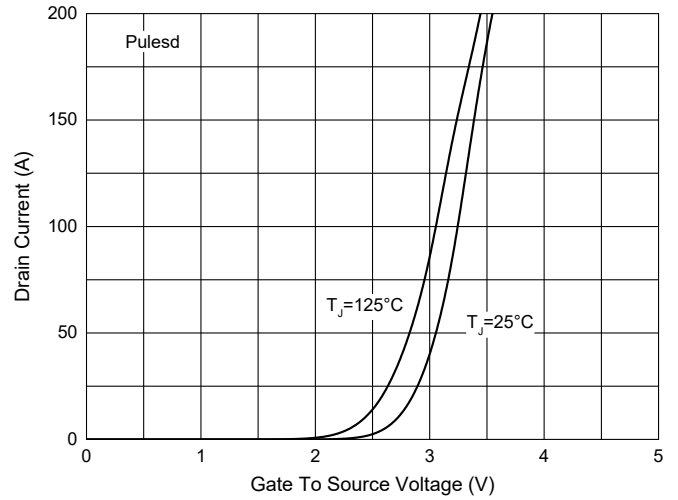


Fig. 3 -  $R_{DS(on)} - V_{GS}$

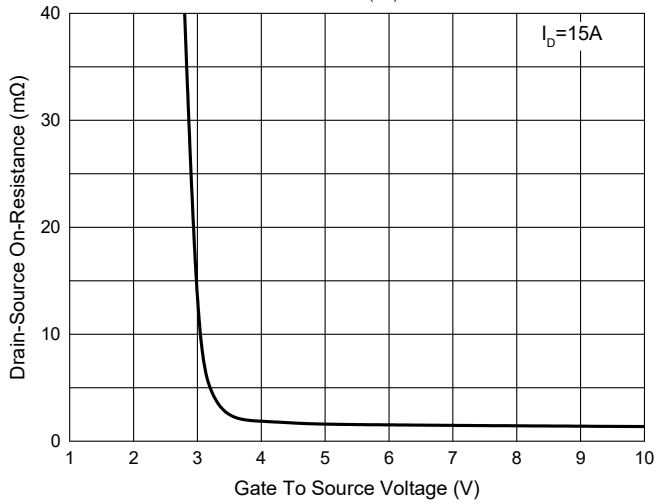


Fig. 4 - Capacitance Characteristics

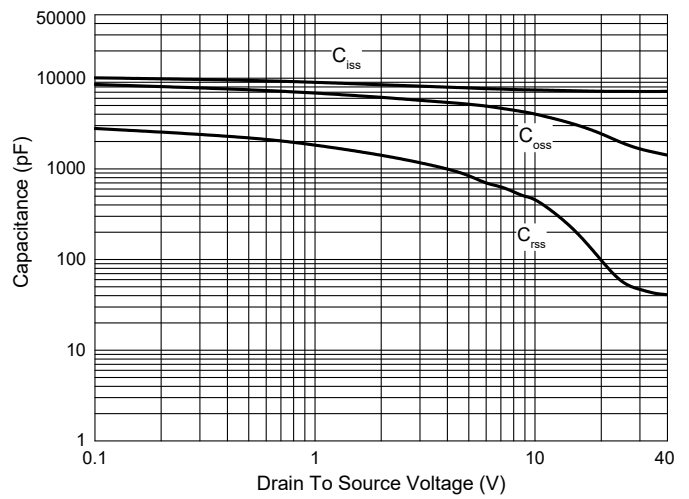


Fig. 5 - Gate Charge

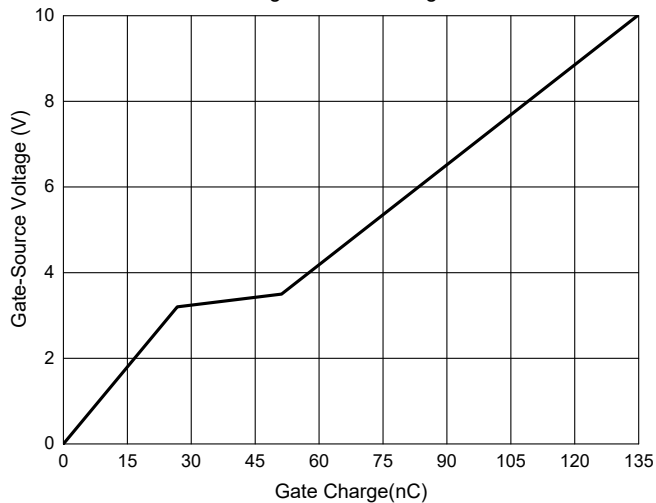
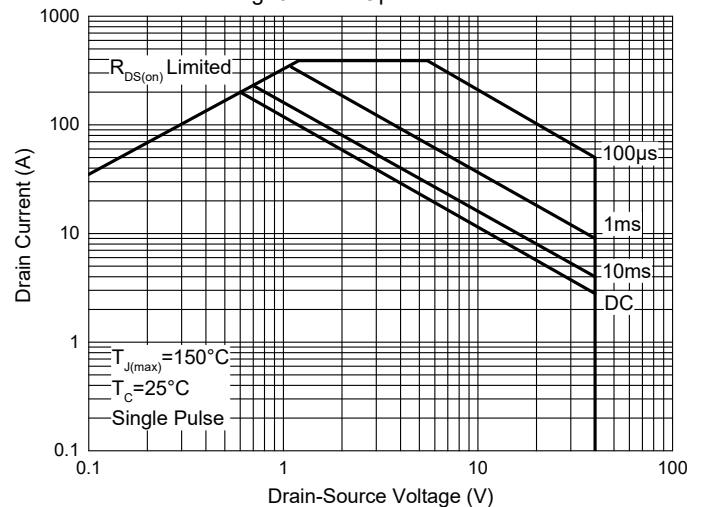


Fig. 6 - Safe Operation Area



## Ordering Information

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

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