

## Features

- Split Gate Trench MOSFET Technology
- High Density Cell Design for Low  $R_{DS(ON)}$
- High Speed Switching
- Moisture Sensitivity Level 3
- 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

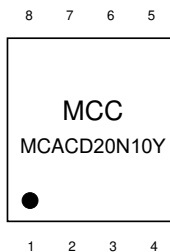
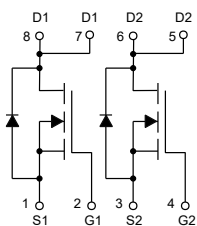
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 45°C/W Junction to Ambient (Note 2)
- Thermal Resistance: 4°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$T_C=25^\circ\text{C}$	20	A
	$T_C=100^\circ\text{C}$	12.6	
Pulsed Drain Current (Note 3)	$I_{DM}$	80	A
Total Power Dissipation (Note 4)	$P_D$	31	W
Avalanche Energy (Note 5)	$E_{AS}$	64	mJ

### Note:

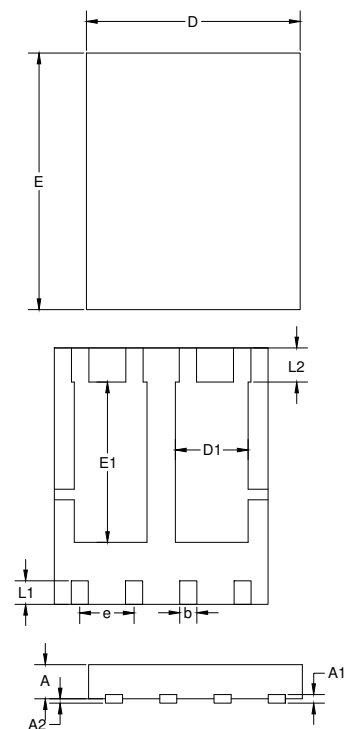
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. copper, in a still air environment with  $T_J=25^\circ\text{C}$ .
3. Repetitive rating; pulse width limited by max. junction temperature.
4.  $P_D$  is based on max. junction temperature, using junction-case thermal resistance.
5.  $V_{DD}=50\text{V}$ ,  $R_G=25\Omega$ ,  $V_G=10\text{V}$ ,  $L=0.5\text{mH}$ .

## Internal Structure and Marking Code



# Dual N-CHANNEL MOSFET

## DFN5060-8D



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
D	0.193	0.201	4.90	5.10	
E	0.232	0.240	5.90	6.10	
A	0.028	0.035	0.70	0.90	
A1	0.008		0.20		BSC
A2	0.000	0.004	0.00	0.10	
D1	0.063	0.071	1.60	1.80	
E1	0.144	0.152	3.65	3.85	
L1	0.018	0.026	0.45	0.65	
L2	0.031		0.80		BSC
b	0.012	0.020	0.30	0.50	
e	0.050		1.27		BSC

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=100V, V_{GS}=0V$			1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=15A$		17.6	22	m $\Omega$
		$V_{GS}=4.5V, I_D=7A$		21	27	
Gate Resistance	$R_g$	F=1 MHz, Open drain		2.0		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				20	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=10A$			1.2	V
Reverse Recovery Time	$t_{rr}$	$I_F=10A, di_F/dt=100A/\mu s$		27		ns
Reverse Recovery Charge	$Q_{rr}$			32		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		1202		pF
Output Capacitance	$C_{oss}$			632		
Reverse Transfer Capacitance	$C_{rss}$			30		
Total Gate Charge	$Q_g$	$V_{DS}=50V, V_{GS}=10V, I_D=10A$		15		nC
Gate-Source Charge	$Q_{gs}$			4.2		
Gate-Drain Charge	$Q_{gd}$			2.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=50V, V_{GS}=10V, I_{DS}=10A, R_{GEN}=3\Omega$		27		ns
Turn-On Rise Time	$t_r$			14		
Turn-Off Delay Time	$t_{d(off)}$			25		
Turn-Off Fall Time	$t_f$			12.8		

**Curve Characteristics**

Fig. 1 - Typical Output Characteristics

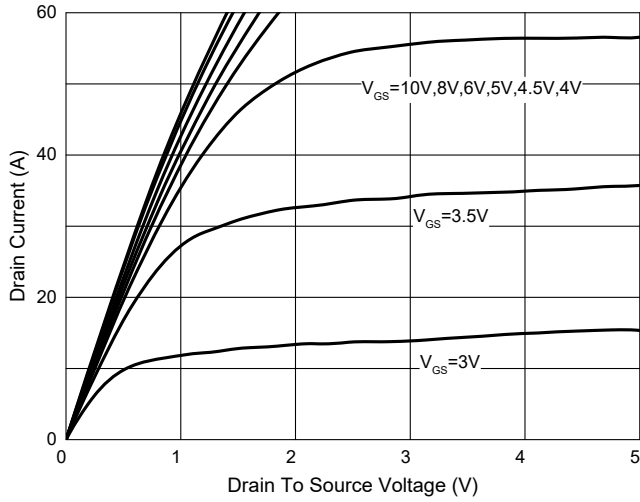


Fig. 2 - Transfer Characteristics

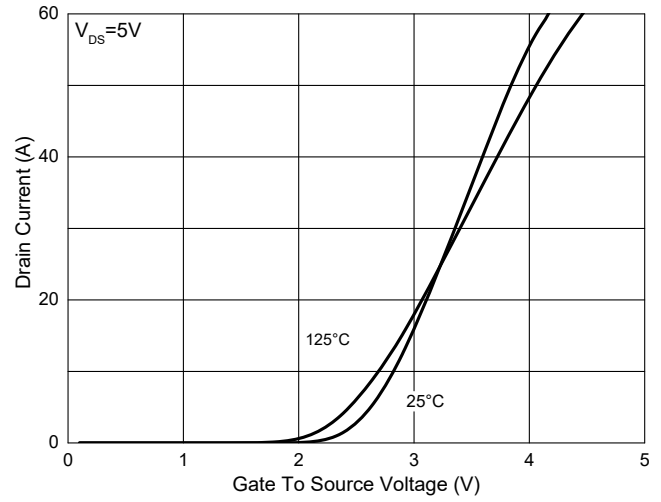


Fig. 3 -  $R_{DS(ON)} - V_{GS}$

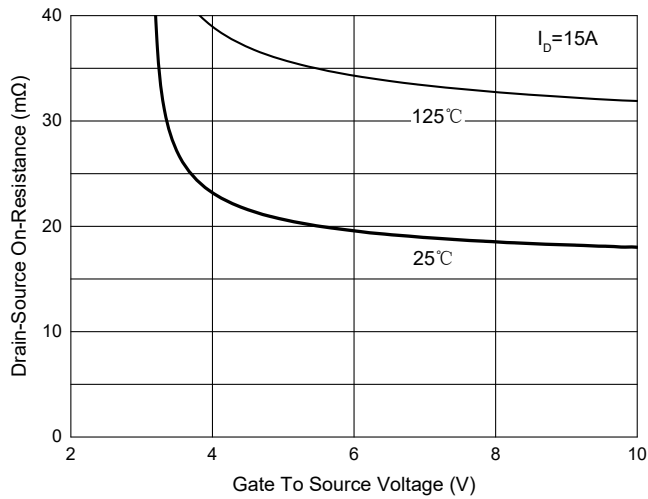


Fig. 4 -  $R_{DS(ON)} - I_D$

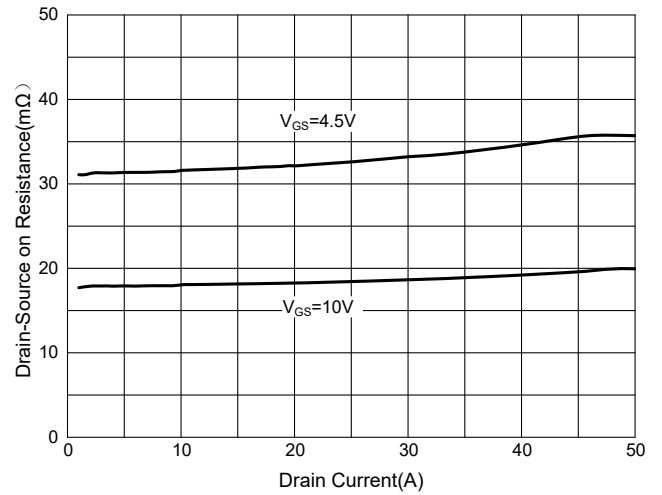


Fig. 5 - Capacitance Characteristics

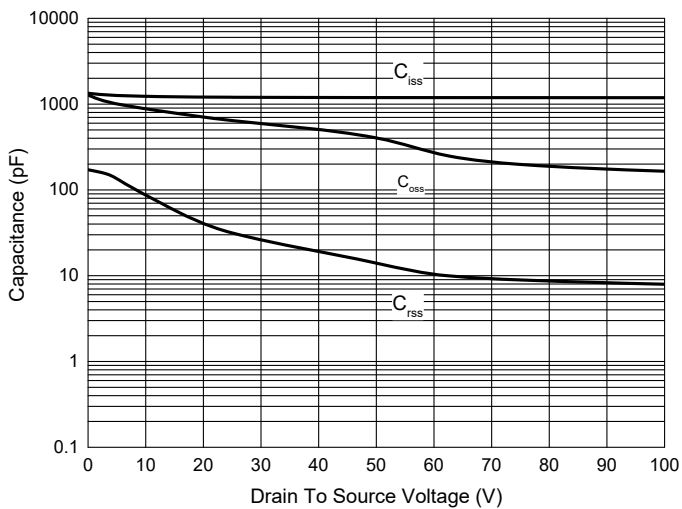
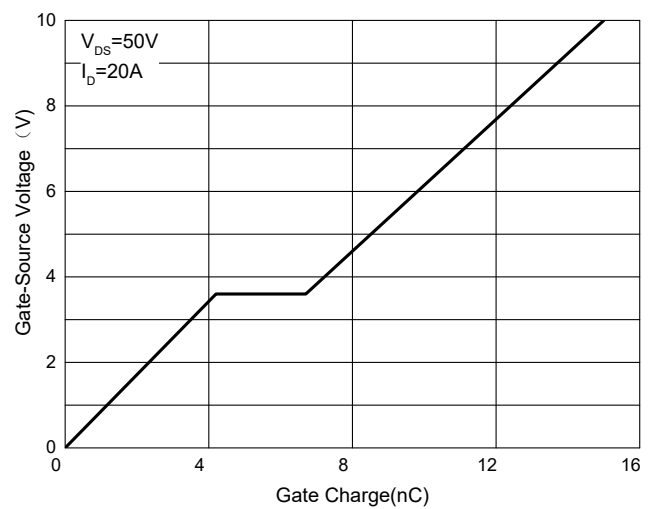


Fig. 6 - Gate Charge



**Curve Characteristics**

Fig. 7 - Normalized Threshold voltage

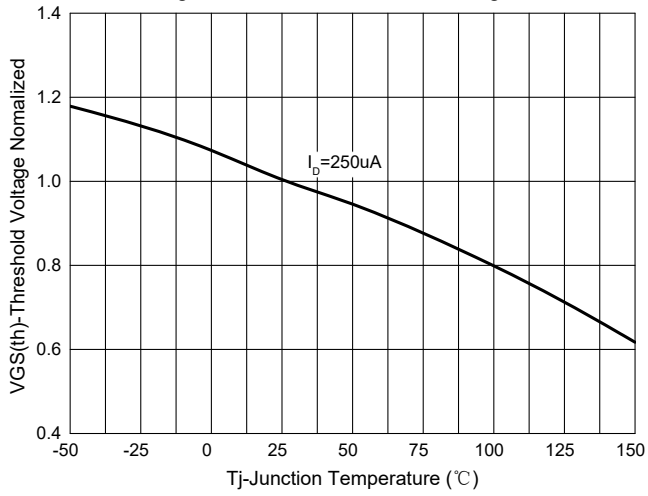


Fig.8-Normalized On Resistance Characteristics

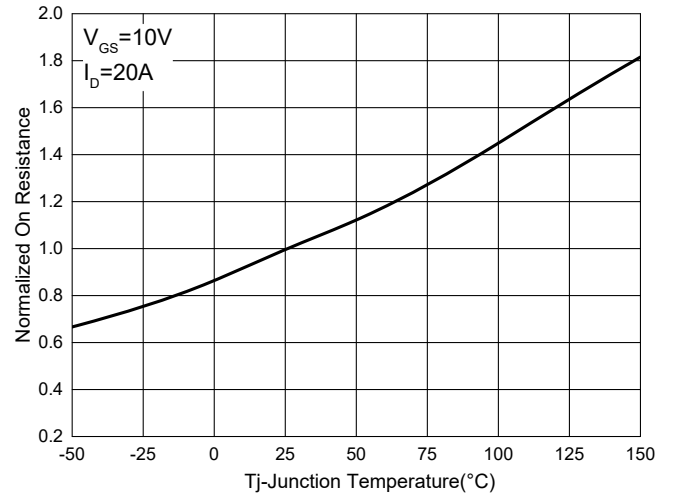


Fig.9 -  $I_s - V_{SD}$

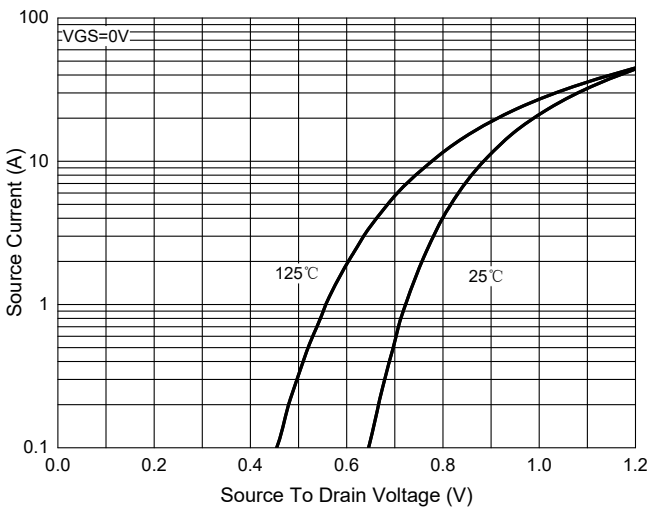


Fig. 10 - Drain Current

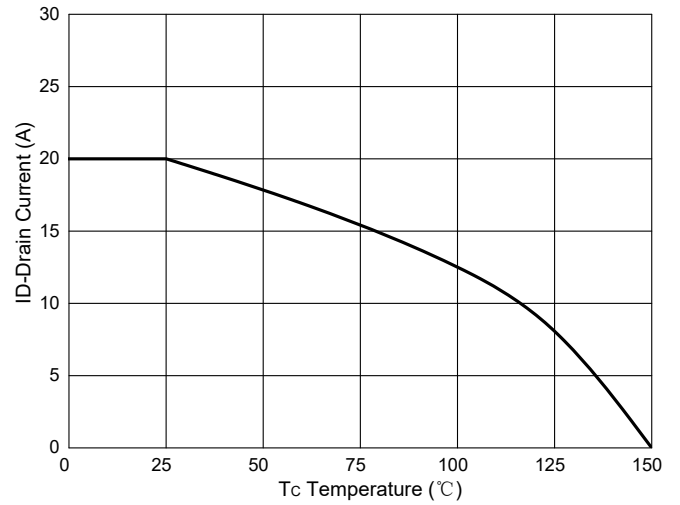
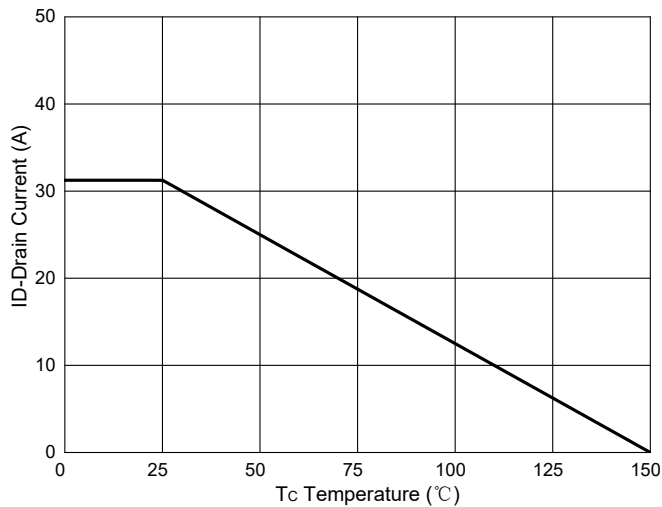


Fig. 10 - Drain Current



Curve Characteristics

Fig. 12 - Safe Operation Area

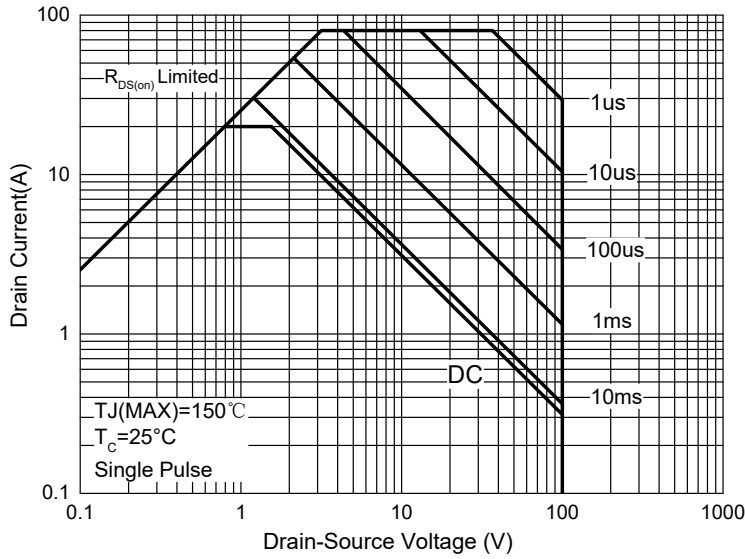
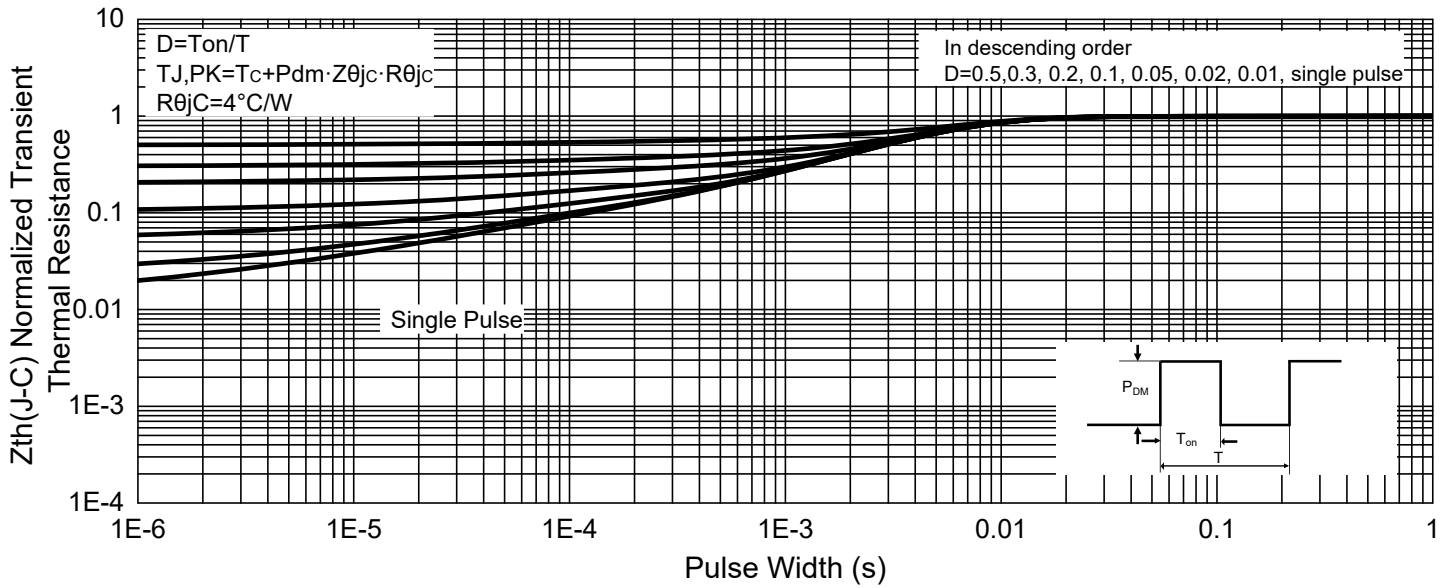


Fig. 13 - Normalized Transient Thermal Impedance



## Ordering Information

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

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