

## Features

- Split Gate Trench MOSFET Technology
- Excellent Package For Heat Dissipation
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

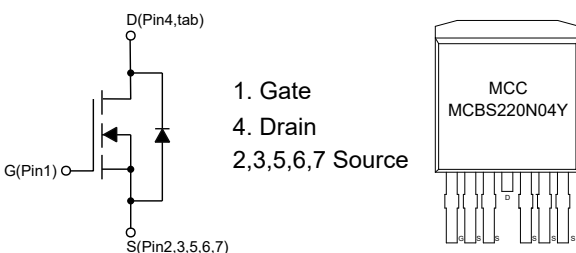
- Operating Junction Temperature Range : -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Thermal Resistance:40°C/W Junction to Ambient<sup>(Note2)</sup>
- Thermal Resistance:0.8°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	40	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	$T_C=25^\circ\text{C}$	220
		$T_C=100^\circ\text{C}$	156
Pulsed Drain Current <sup>(Note3)</sup>	$I_{DM}$	880	A
Total Power Dissipation <sup>(Note4)</sup>	$P_D$	188	W
Avalanche Energy <sup>(Note5)</sup>	$E_{AS}$	760	mJ

Note:

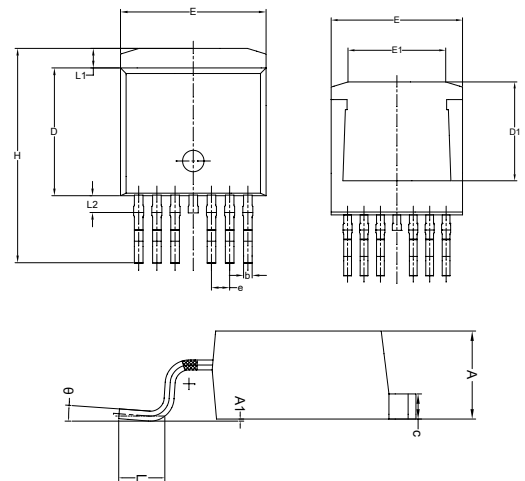
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The Power dissipation  $P_{DSM}$  is based on  $R_{\theta JA} t \leq 10s$  and the maximum allowed junction temperature of 175°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.  $P_D$  is based on max. junction temperature, using junction-case thermal resistance.
5.  $T_J=25^\circ\text{C}$ ,  $V_{DD}=30V$ ,  $V_{GS}=10V$ ,  $L=1mH$

## Internal Structure and Marking Code

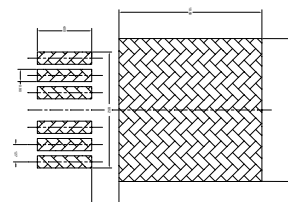


# N-CHANNEL MOSFET

## TO-263-7



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.167	0.183	4.24	4.64	
A1	0.000	0.010	0.00	0.25	
b	0.020	0.035	0.50	0.90	
c	0.045	0.055	1.15	1.40	
D	0.347	0.364	8.82	9.25	
D1	0.270		6.86		
E	0.392	0.408	9.96	10.36	
E1	0.256	0.310	6.50	7.89	
e	0.050		1.27		TYP.
H	0.575	0.625	14.61	15.88	
L	0.070	0.110	1.78	2.79	
L1	0.039	0.056	0.98	1.42	
L2		0.070		1.78	
$\theta$			0°	8°	



**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
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=40V, V_{GS}=0V$			1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.1	4.0	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		0.85	1.1	m $\Omega$
		$V_{GS}=6V, I_D=20A$		2	2.6	
Gate Resistance	$R_g$	f=1 MHz, Open drain		1.1		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				220	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=30A$			1.3	V
Reverse Recovery Time	$t_{rr}$	$I_S=50A, di/dt=100A/\mu s$		71		ns
Reverse Recovery Charge	$Q_{rr}$			96		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		7967		pF
Output Capacitance	$C_{oss}$			2402		
Reverse Transfer Capacitance	$C_{rss}$			277		
Total Gate Charge	$Q_g$	$V_{DS}=20V, V_{GS}=10V, I_D=50A$		132		nC
Gate-Source Charge	$Q_{gs}$			38		
Gate-Drain Charge	$Q_{gd}$			43		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=20V, V_{GS}=10V,$ $R_G=4.7\Omega, I_{DS}=50A$		32		ns
Turn-On Rise Time	$t_r$			153		
Turn-Off Delay Time	$t_{d(off)}$			47		
Turn-Off Fall Time	$t_f$			70		

### Curve Characteristics

Fig. 1 - Typical Output Characteristics

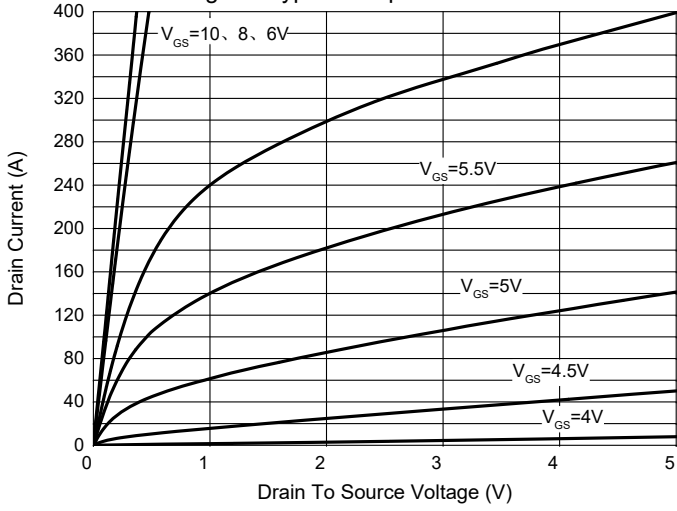


Fig. 2 - Transfer Characteristics

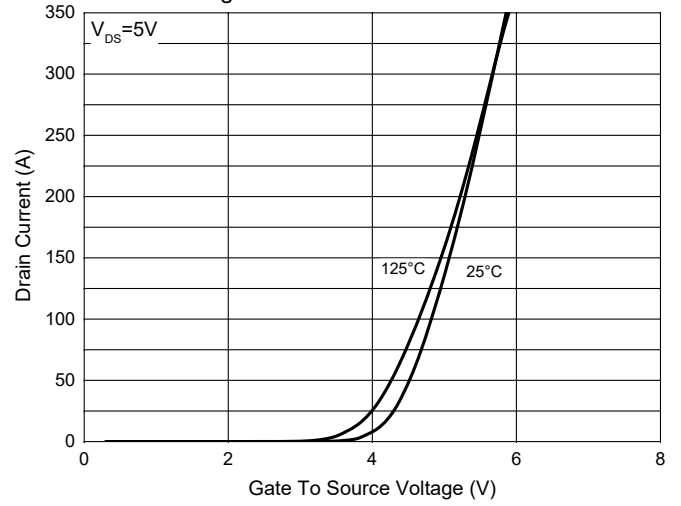


Fig. 3 -  $R_{DS(ON)} - V_{GS}$

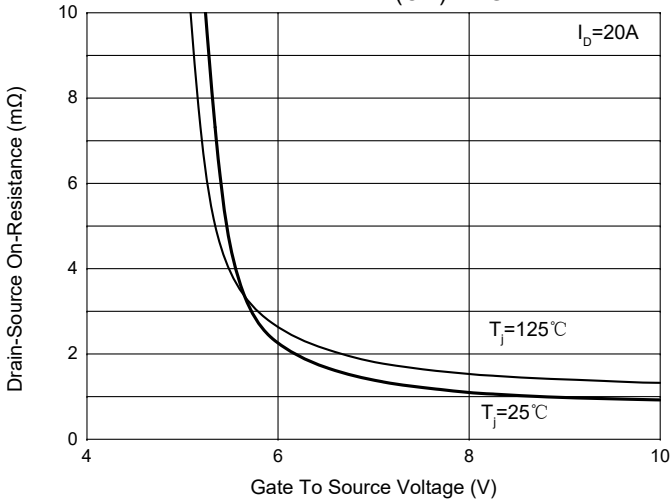


Fig. 4 -  $R_{DS(ON)} - I_D$

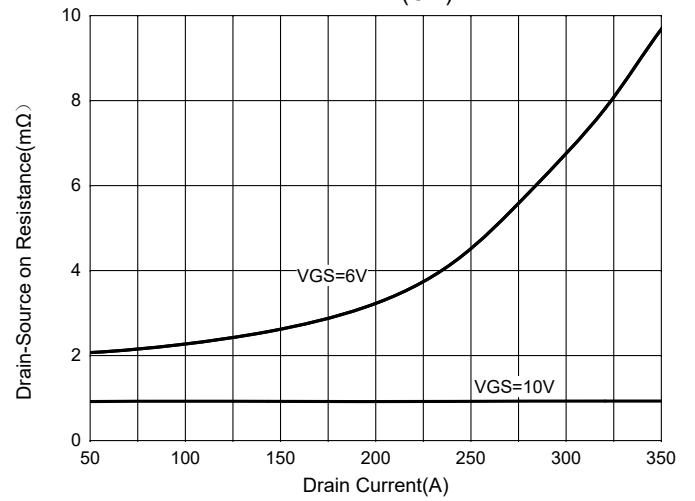


Fig. 5 - Capacitance Characteristics

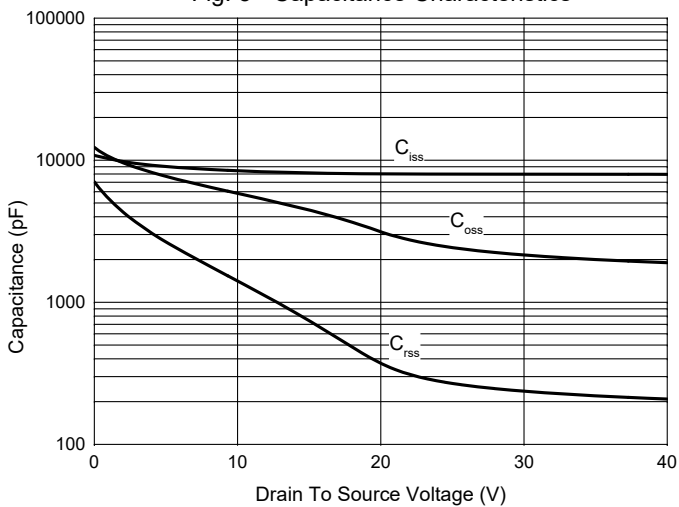
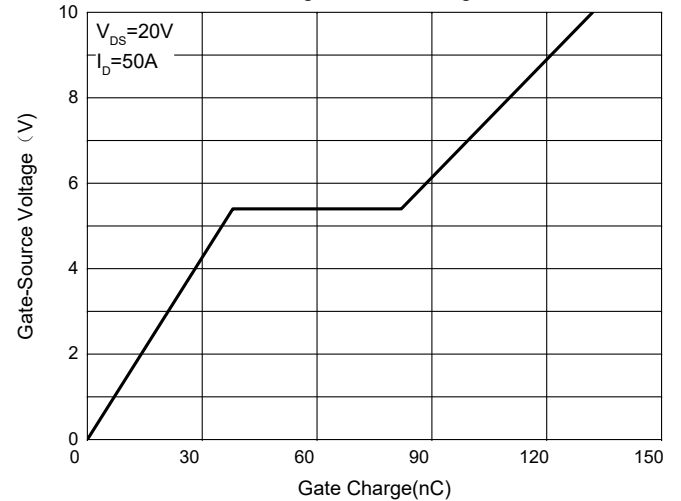


Fig. 6 - Gate Charge



**Curve Characteristics**

Fig. 7 - Normalized Threshold Voltage

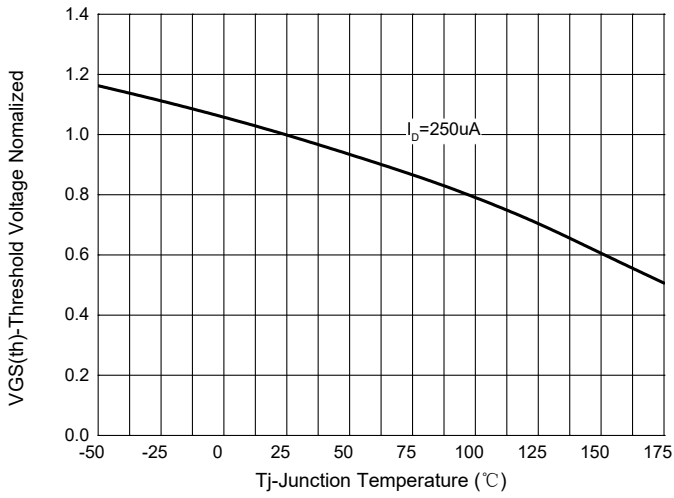


Fig.8-Normalized On Resistance Characteristics

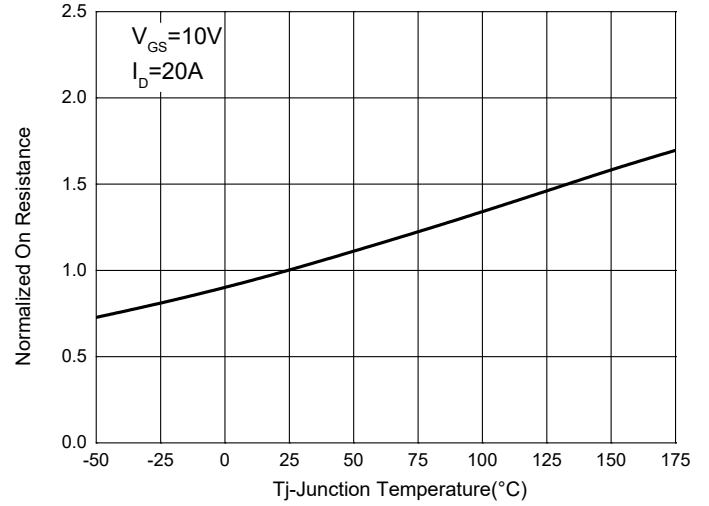


Fig.9- I<sub>S</sub>—V<sub>SD</sub>

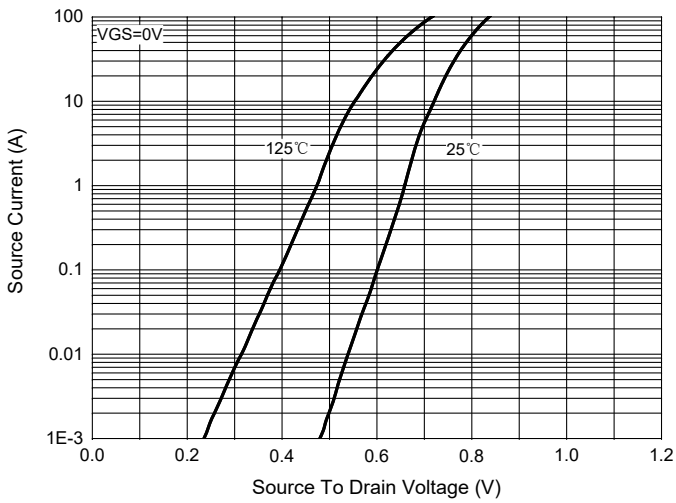


Fig. 10 - Drain Current

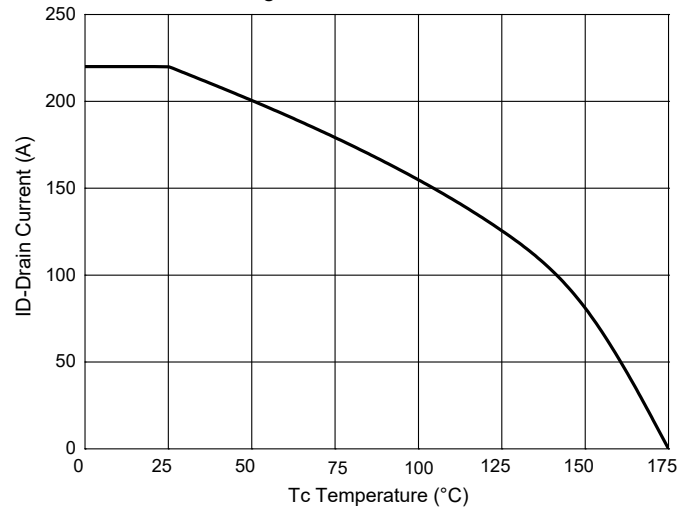
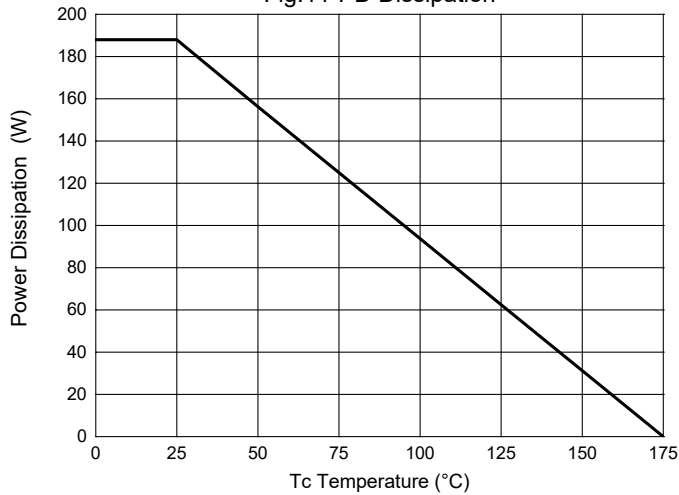


Fig.11-PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

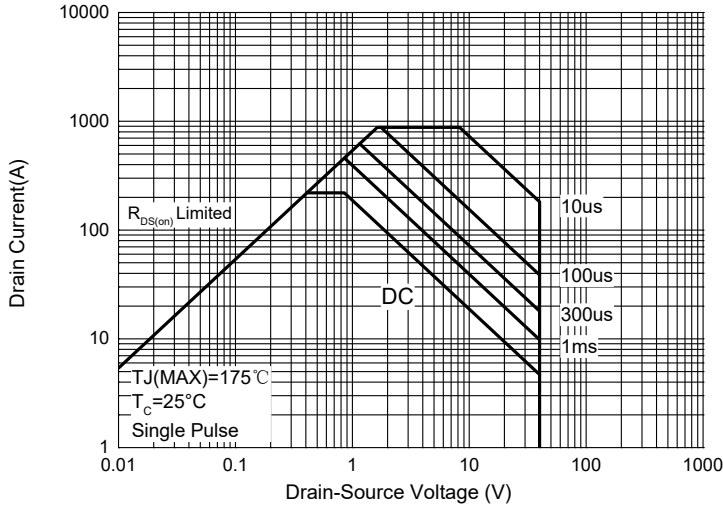
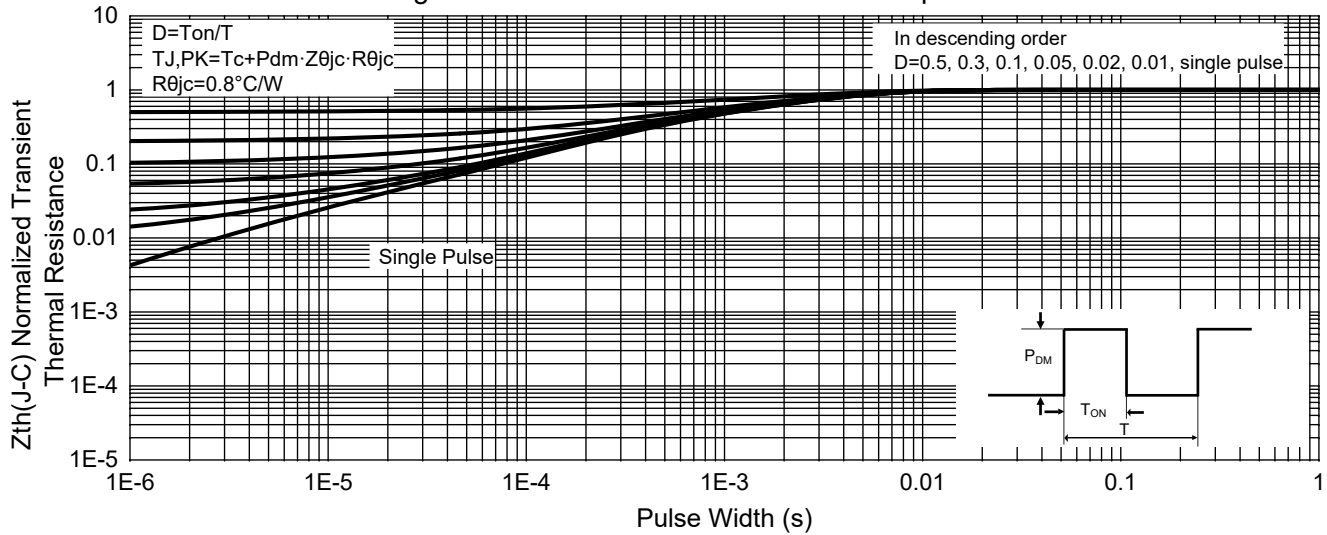


Fig. 13 - Normalized Transient Thermal Impedance



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 800pcs/Reel

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