

## Features

- Split Gate Trench MOSFET Technology
- Fast Switching
- Moisture Sensitivity Level 1
- 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

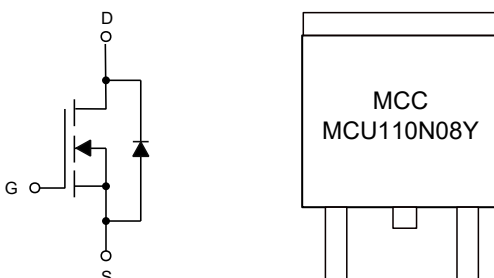
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 40°C/W Junction to Ambient (Note 2)
- Thermal Resistance: 1.5°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	80	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	$T_C=25^\circ\text{C}$	110
		$T_C=100^\circ\text{C}$	69
Pulsed Drain Current (Note 3)	$I_{DM}$	440	A
Total Power Dissipation (Note 4)	$P_D$	83	W
Single Pulse Avalanche Energy (Note 5)	$E_{AS}$	361	mJ

Note:

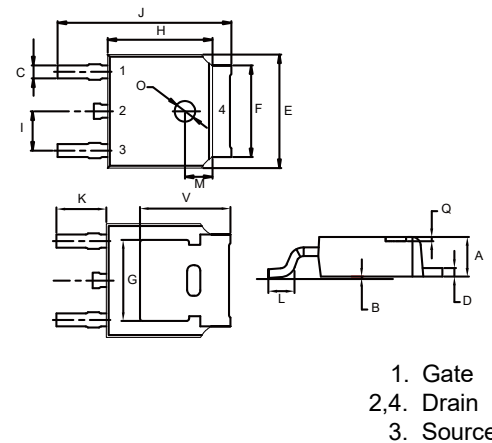
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ .
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.  $T_J=25^\circ\text{C}$ ,  $V_{DD}=50\text{V}$ ,  $V_{GS}=10\text{V}$ ,  $R_g=25\Omega$ ,  $L=0.5\text{mH}$ .

## Internal Structure and Marking Code



# N-CHANNEL MOSFET

## DPAK(TO-252)



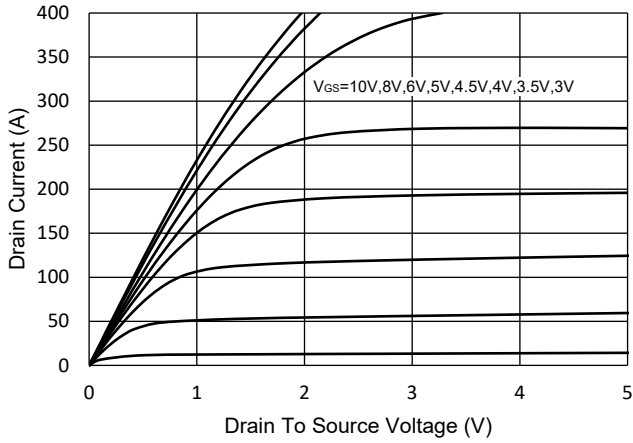
DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.087	0.094	2.20	2.40	
B	0.000	0.005	0.00	0.13	
C	0.026	0.034	0.66	0.86	
D	0.018	0.023	0.46	0.58	
E	0.256	0.264	6.50	6.70	
F	0.201	0.215	5.10	5.46	
G	0.190		4.83		TYP.
H	0.236	0.244	6.00	6.20	
I	0.086	0.094	2.18	2.39	
J	0.386	0.409	9.80	10.40	
K	0.114		2.90		TYP.
L	0.047	0.069	1.20	1.75	
M	0.063		1.60		TYP.
O	0.043	0.051	1.10	1.30	
Q	0.000	0.012	0.00	0.30	
V	0.211		5.35		TYP.

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

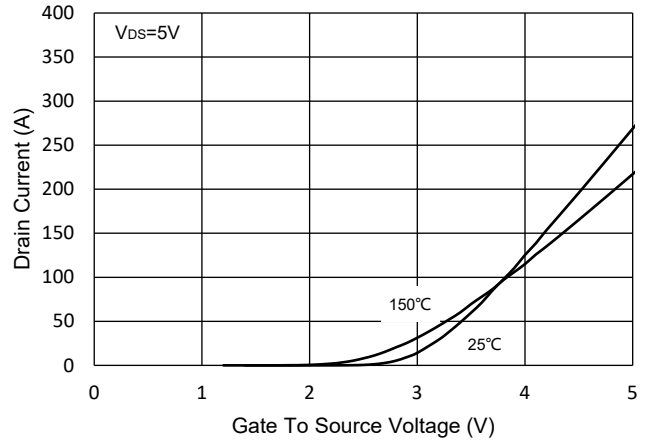
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	80			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$			1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.4	1.8	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=55A$		4.1	5.6	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$		5.1	7	
Gate resistance	$R_g$	f=1MHz, Open drain		1.9		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				110	A
Body Diode Voltage	$V_{SD}$	$I_{SD}=55A, V_{GS}=0V$		0.9	1.2	V
Reverse Recovery Time	$t_{rr}$	$I_F=55A, di/dt=380A/\mu s$		40		ns
Reverse Recovery Charge	$Q_{rr}$			110		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=40V, V_{GS}=0V, f=1MHz$		5200		pF
Output Capacitance	$C_{oss}$			892		
Reverse Transfer Capacitance	$C_{riss}$			29		
Total Gate Charge	$Q_g$	$V_{DS}=40V, V_{GS}=10V, I_D=55A$		88		nC
Gate-Source Charge	$Q_{gs}$			21		
Gate-Drain Charge	$Q_{gd}$			19		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=40V, I_D=55A, V_{GS}=10V, R_G=2.2\Omega$		12		ns
Turn-On Rise Time	$t_r$			126		
Turn-Off Delay Time	$t_{d(off)}$			57		
Turn-Off Fall Time	$t_f$			18		

## Curve Characteristics

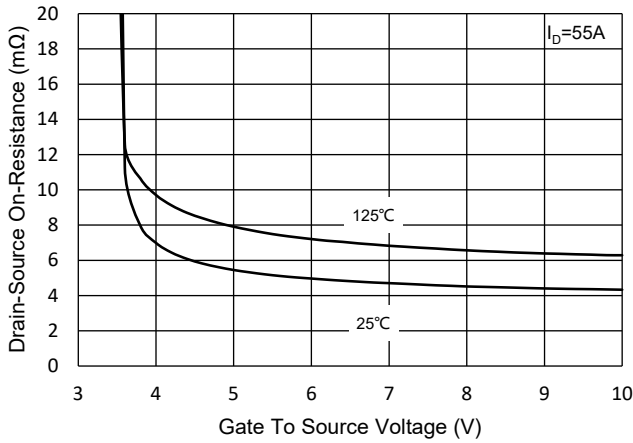
**Fig. 1 - Typical Output Characteristics**



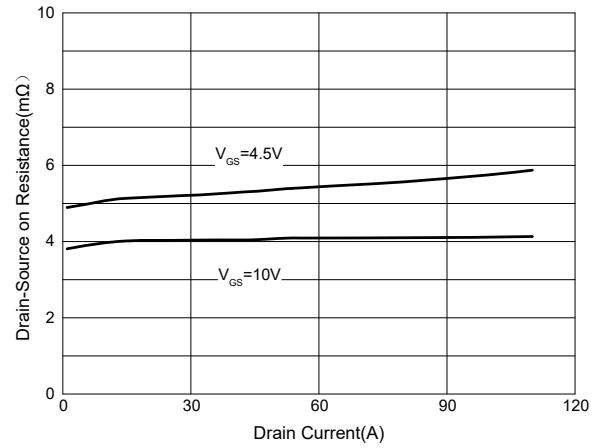
**Fig.2 - Transfer Characteristic**



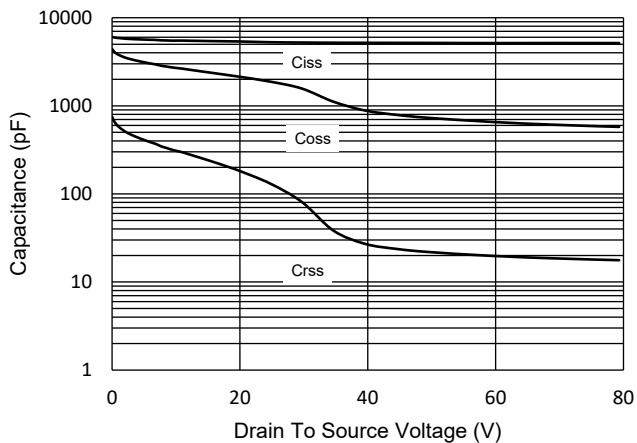
**Fig.3 -  $R_{DS(ON)}$  -  $V_{GS}$**



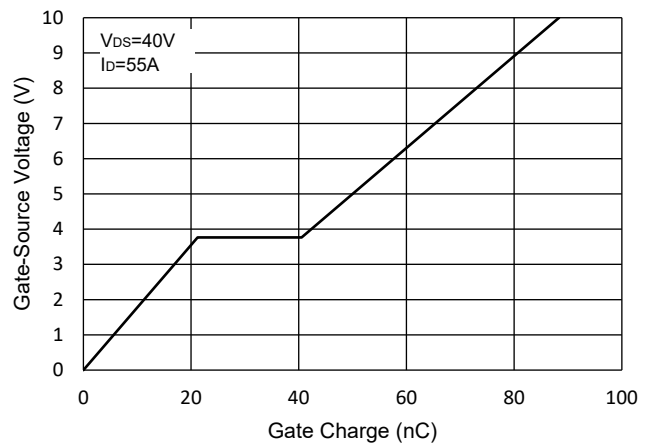
**Fig.4 -  $R_{DS(ON)}$  -  $I_D$**



**Fig.5 - Capacitance Characteristics**

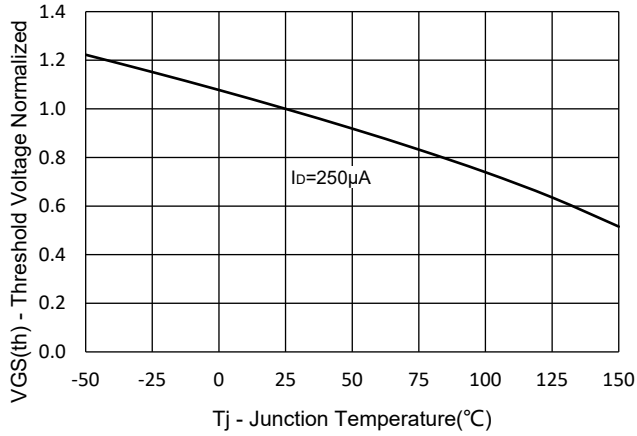


**Fig.6 - Gate Charge**

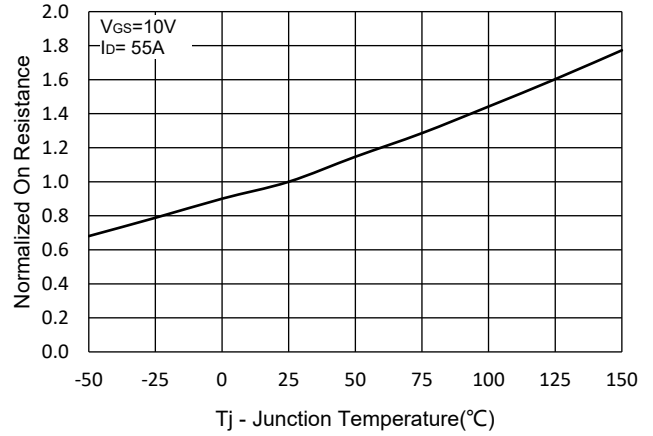


**Curve Characteristics**

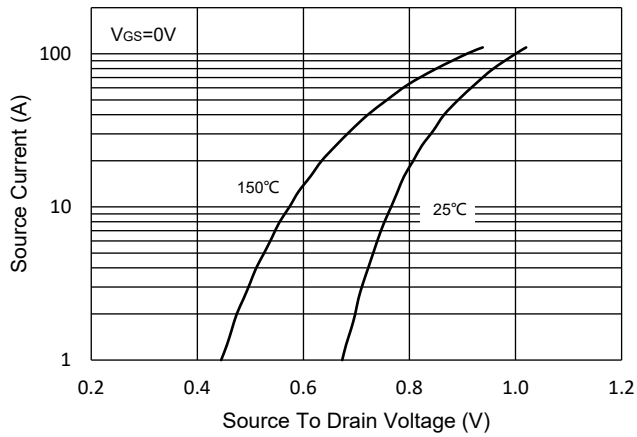
**Fig.7 - Normalized Threshold Voltage**



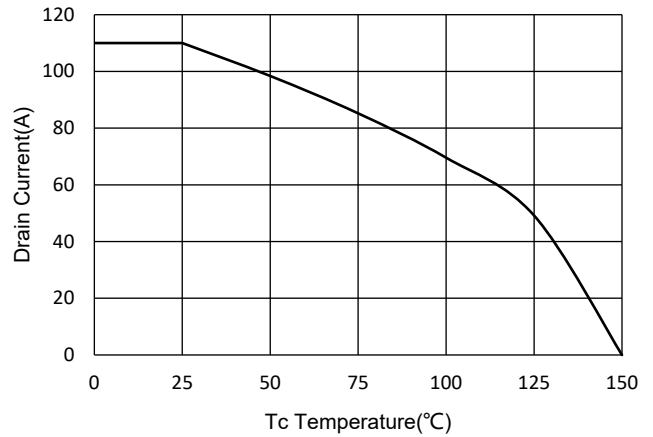
**Fig.8 - Normalized On Resistance Characteristics**



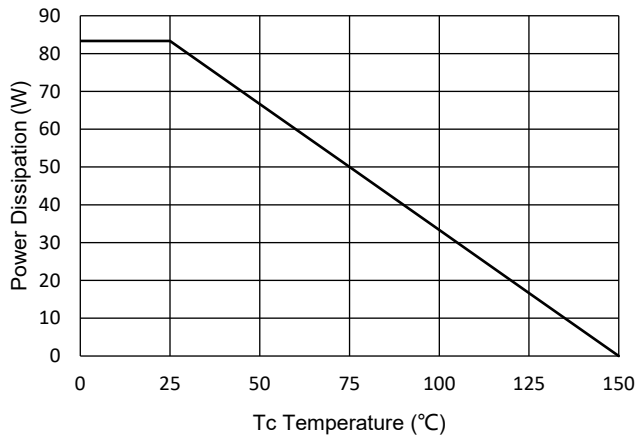
**Fig.9 -  $I_S - V_{SD}$**



**Fig.10 - Drain Current**



**Fig.11 - PD Dissipation**



## Curve Characteristics

Fig.12 - Safe Operation Area

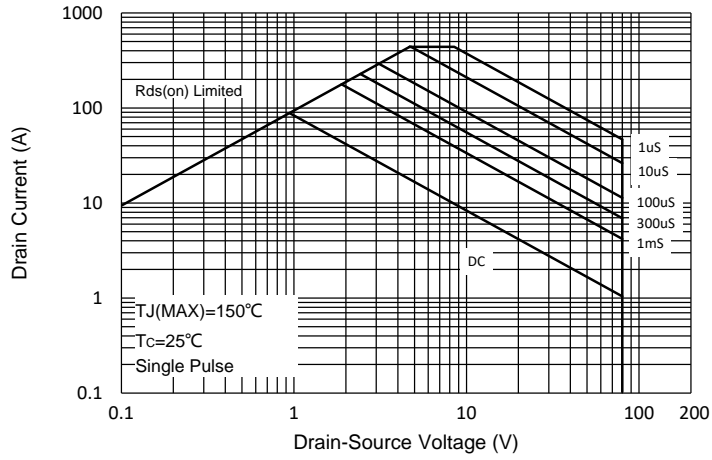
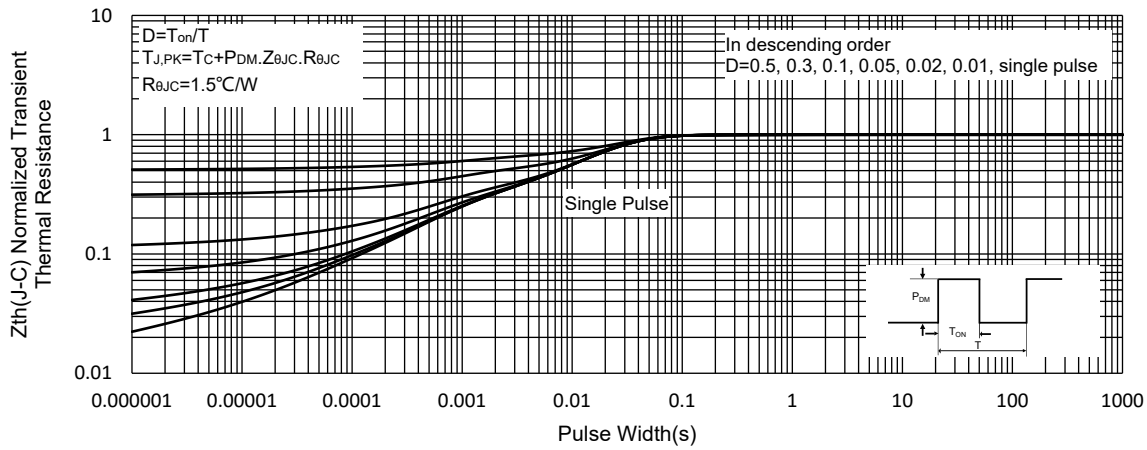


Fig.13 - Normalized Transient Thermal Impedance



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 2.5Kpcs/Reel

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