

## Features

- Split Gate Trench MOSFET Technology
- Excellent Stability and Uniformity
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device<sup>(Note 1)</sup>
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

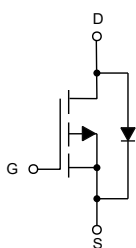
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 40°C/W Junction to Ambient <sup>(Note 2)</sup>
- Thermal Resistance: 1°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain -Source Voltage	$V_{DS}$	-60	V
Gate -Source Voltage	$V_{GS}$	±20	V
Drain Current-Continuous	$I_D$	$T_C=25^\circ\text{C}$	-110
		$T_C=100^\circ\text{C}$	-69
Drain Current-Pulse <sup>(Note 3)</sup>	$I_{DM}$	-440	A
Power Dissipation <sup>(Note 4)</sup>	$P_D$	125	W
Single Pulsed Avalanche Energy <sup>(Note 5)</sup>	$E_{AS}$	625	mJ

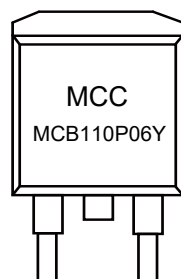
Note:

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.  $T_J=25^\circ\text{C}$ ,  $V_{DD}=-40\text{V}$ ,  $V_{GS}=-10\text{V}$ ,  $R_G=25\Omega$ ,  $L=2\text{mH}$ .

## Internal Structure and Marking Code

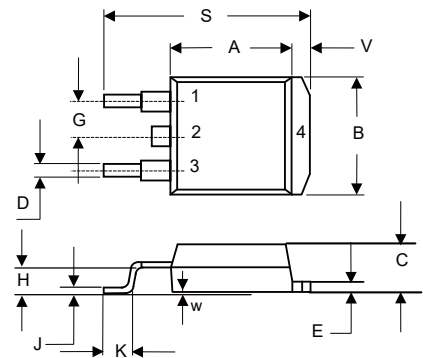


1. GATE
2. DRAIN
3. SOURCE



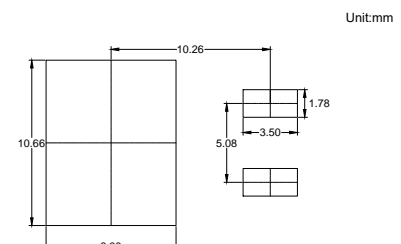
# P-CHANNEL MOSFET

## D<sup>2</sup>-PAK



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.331	0.370	8.40	9.40	
B	0.378	0.417	9.60	10.60	
C	0.165	0.189	4.20	4.80	
D	0.027	0.037	0.68	0.94	
E	0.045	0.055	1.14	1.40	
G	0.10		2.54		TYP.
H	0.096	0.134	2.43	3.40	
J	0.011	0.025	0.28	0.64	
K	0.071	0.131	1.80	3.32	
S	0.575	0.625	14.60	15.87	
V	0.042	0.058	1.07	1.47	
W	0.000	0.010	0.00	0.25	

### Suggested Solder Pad Layout

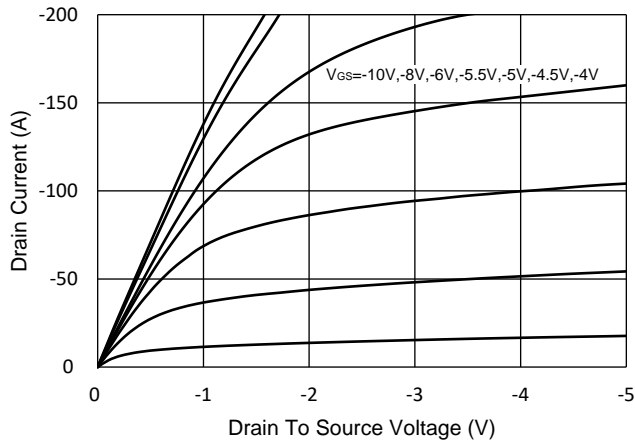


**Electrical Characteristics @ 25°C (Unless Otherwise Noted)**

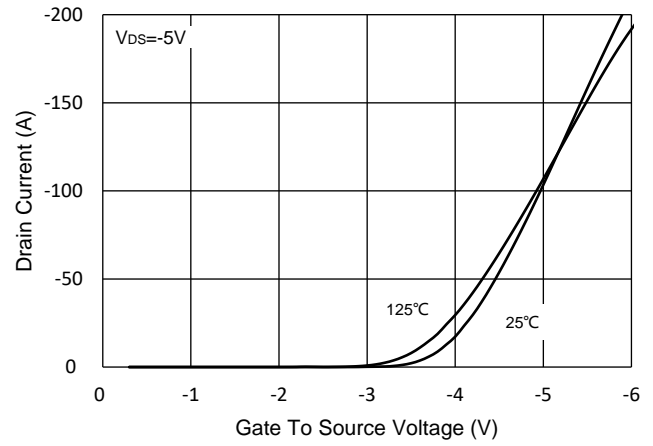
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-60			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-60V, V_{GS}=0V$			-1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-2.0	-2.6	-3.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-20A$		6.2	8.4	m $\Omega$
		$V_{GS}=-6V, I_D=-20A$		7.4	10	
Gate Resistance	$R_g$	f=1MHz, Open drain		8		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				-110	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-20A$			-1.2	V
Reverse Recovery Time	$t_{rr}$	$I_S=-40A, di/dt=100A/\mu s$		59		ns
Reverse Recovery Charge	$Q_{rr}$			88		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-30V, V_{GS}=0V, f=1MHz$		5352		pF
Output Capacitance	$C_{oss}$			926		
Reverse Transfer Capacitance	$C_{rss}$			44		
Total Gate Charge	$Q_g$	$V_{DS}=-30V, V_{GS}=-10V, I_D=-3A$		83		nC
Gate-Source Charge	$Q_{gs}$			16		
Gate-Drain Charge	$Q_{gd}$			18		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-30V, V_{GS}=-10V, R_G=6\Omega, I_D=-3A$		15		ns
Turn-On Rise Time	$t_r$			26		
Turn-Off Delay Time	$t_{d(off)}$			200		
Turn-Off Fall Time	$t_f$			83		

## Curve Characteristics

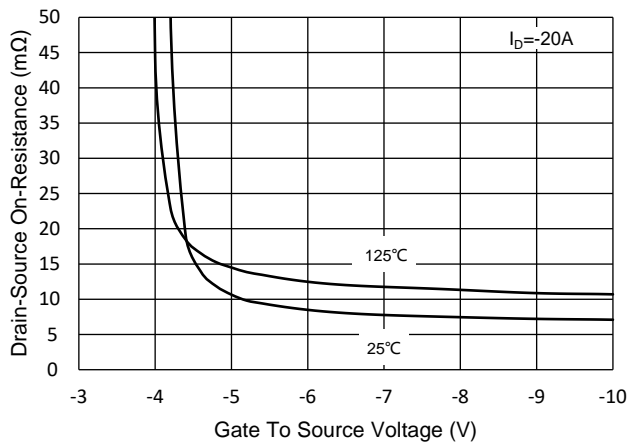
**Fig.1 - Typical Output Characteristics**



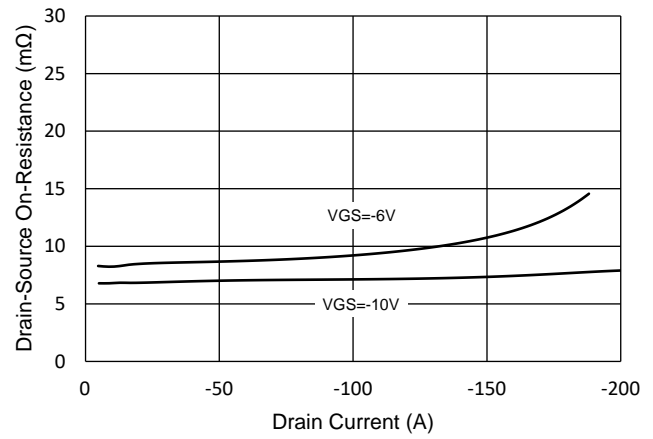
**Fig.2 - Transfer Characteristic**



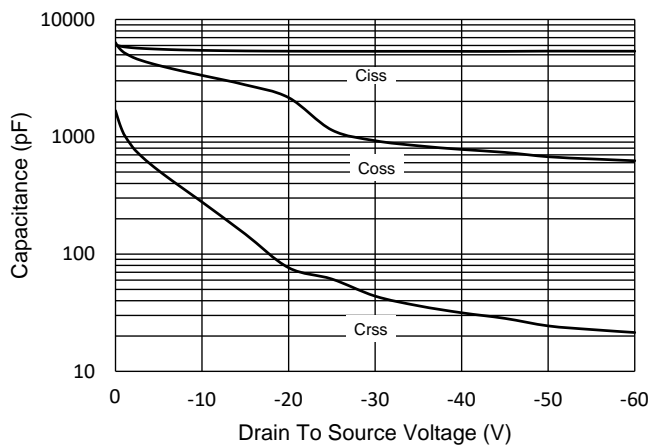
**Fig.3 -  $R_{DS(ON)}$  -  $V_{GS}$**



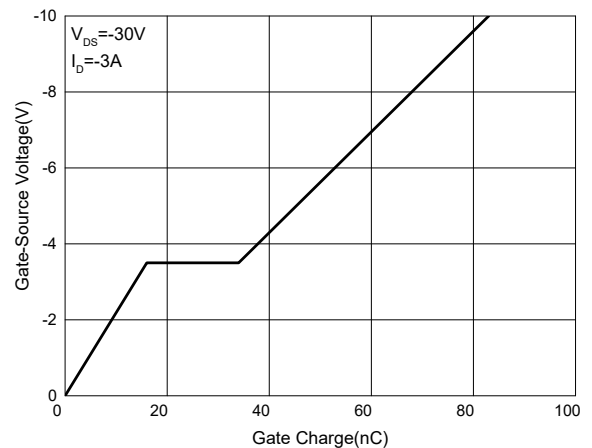
**Fig.4 -  $R_{DS(ON)}$  -  $I_D$**



**Fig.5 - Capacitance Characteristics**

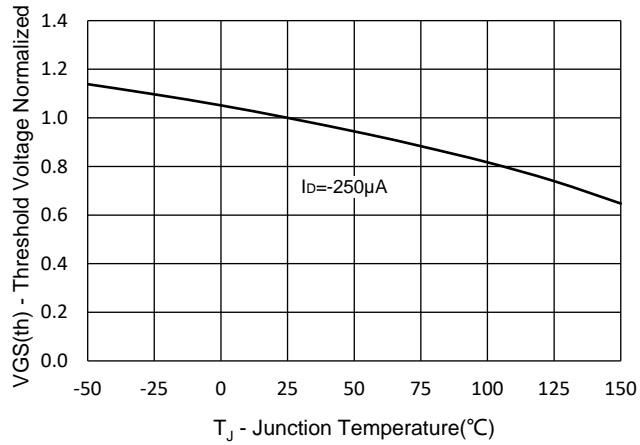


**Fig.6 - Gate Charge**

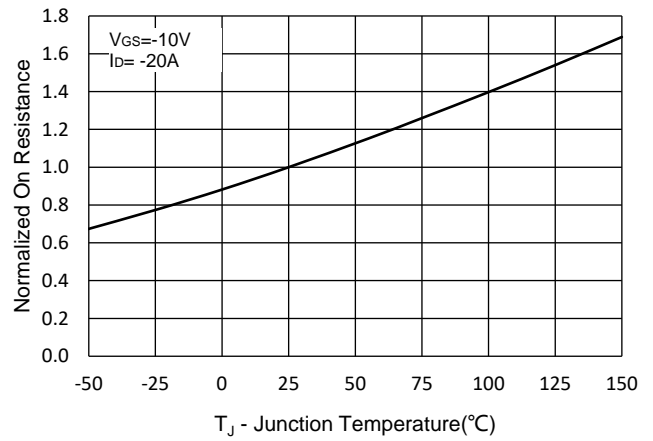


## Curve Characteristics

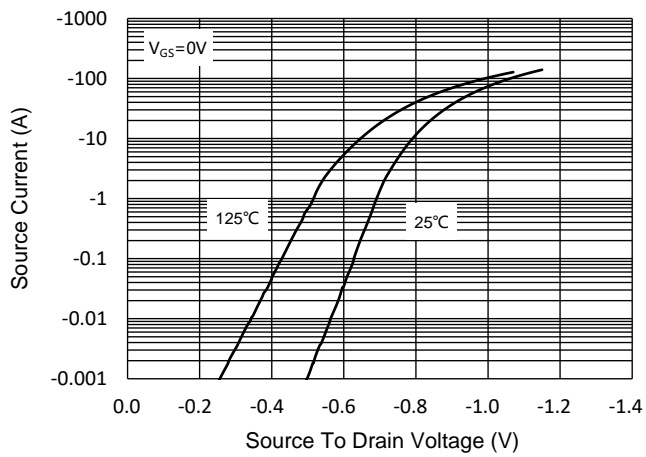
**Fig.7 - Normalized Threshold Voltage**



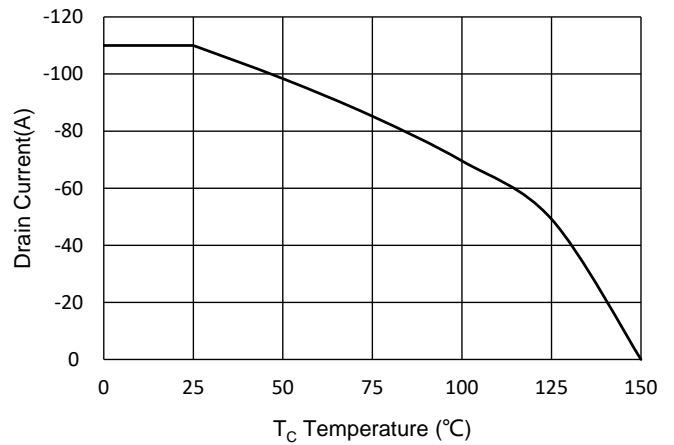
**Fig.8 - Normalized On Resistance Characteristics**



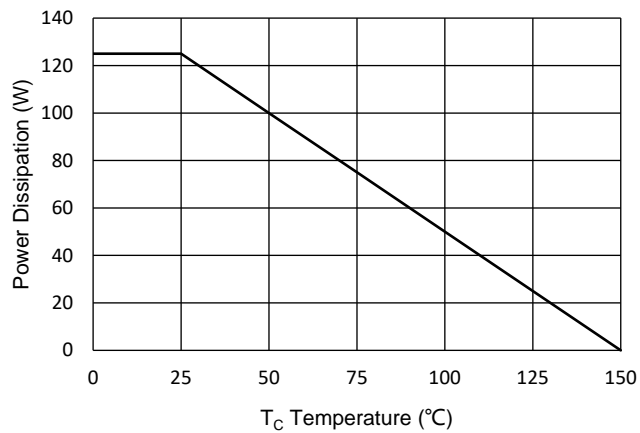
**Fig.9 - I<sub>S</sub> - V<sub>SD</sub>**



**Fig.10 - Drain Current**



**Fig.11 - PD Dissipation**



## Curve Characteristics

Fig.12 - Safe Operation Area

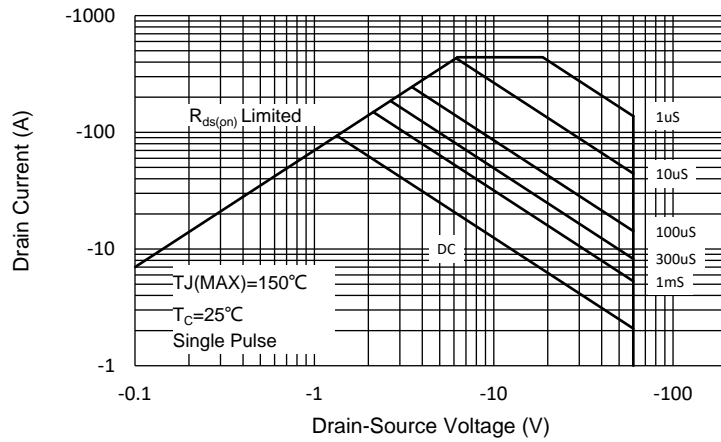
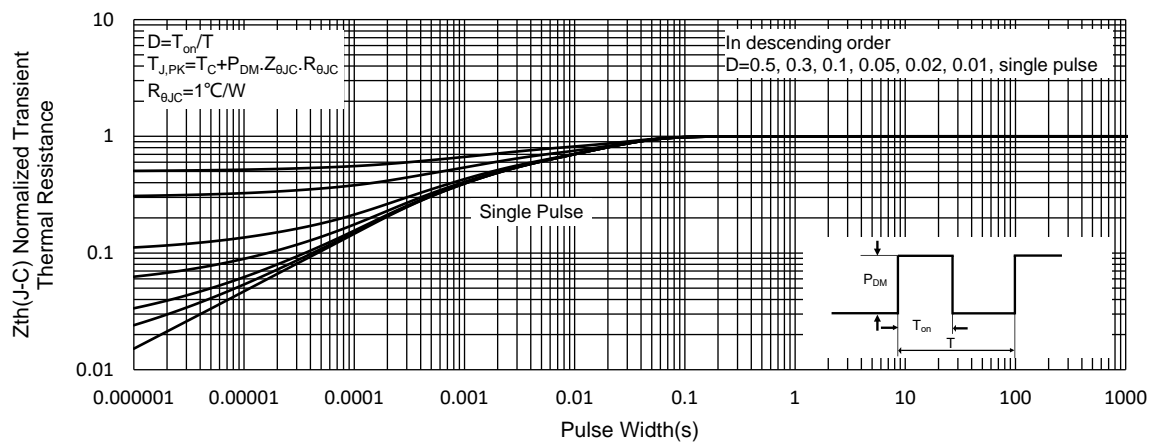


Fig.13 - Normalized Transient Thermal Impedance



## Ordering Information

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

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