

**Features**

- AEC-Q101 Qualified
- Split Gate Trench MOSFET Technology
- Moisture Sensitivity Level 1
- Halogen Free."Green" Device<sup>(Note1)</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 +175°C
- Storage Temperature Range: -55°C to +175°C
- Thermal Resistance:40°C/W Junction to Ambient<sup>(Note2)</sup>
- Thermal Resistance:1.2°C/W Junction to Case

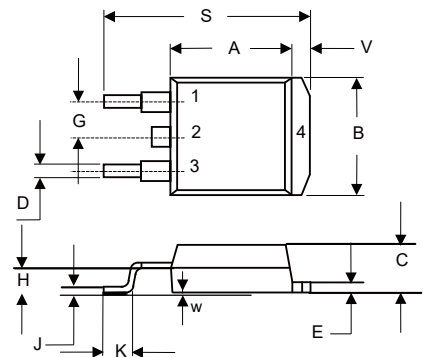
Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	$T_C=25^\circ C$	80
		$T_C=100^\circ C$	57
Pulsed Drain Current <sup>(Note3)</sup>	$I_{DM}$	320	A
Total Power Dissipation <sup>(Note4)</sup>	$P_D$	125	W
Single Pulse Avalanche Energy <sup>(Note5)</sup>	$E_{AS}$	145	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  $T_A=25^\circ C$ .
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.  $T_J=25^\circ C$ ,  $V_{DD}=40V$ ,  $V_{GS}=10V$ ,  $R_g=25\Omega$ ,  $L=1mH$ .

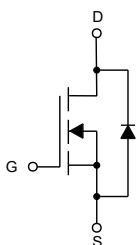
**N-CHANNEL MOSFET**

**D2-PAK**

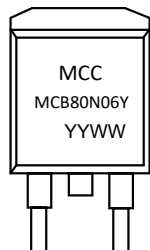


DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.331	0.370	8.40	9.40	
B	0.378	0.417	9.60	10.60	
C	0.165	0.189	4.20	4.80	
D	0.027	0.037	0.68	0.94	
E	0.045	0.055	1.14	1.40	
G	0.010		2.54		TYP.
H	0.096	0.134	2.43	3.40	
J	0.011	0.025	0.28	0.64	
K	0.071	0.131	1.80	3.32	
S	0.575	0.625	14.60	15.87	
V	0.042	0.058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

**Internal Structure and Marking Code**

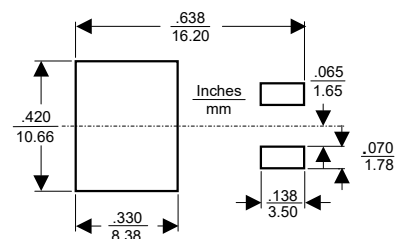


- 1.GATE
- 2.DRAIN
- 3.SOURCE
- 4.DRAIN



YYWW: 4 codes in total  
YY is the year  
WW is the week

**Suggested Solder Pad Layout**



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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=48V, V_{GS}=0V$			1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.6	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		4.1	5.5	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$		4.8	6.5	
Gate Resistance	$R_g$	f=1 MHz, Open drain		1.6		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				80	A
Body Diode Voltage	$V_{SD}$	$I_S=20A, V_{GS}=0V$			1.3	V
Reverse Recovery Time	$t_{rr}$	$I_F=20A, di/dt=100A/\mu s$		32.4		ns
Reverse Recovery Charge	$Q_{rr}$			23.3		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		1677		pF
Output Capacitance	$C_{oss}$			760		
Reverse Transfer Capacitance	$C_{rss}$			72		
Total Gate Charge	$Q_g$	$V_{DS}=30V, V_{GS}=10V, I_D=30A$		31		nC
Gate-Source Charge	$Q_{gs}$			4.5		
Gate-Drain Charge	$Q_{gd}$			7.7		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=30V, I_D=30A$ $V_{GS}=10V, R_G=3\Omega$		8.8		ns
Turn-On Rise Time	$t_r$			57.6		
Turn-Off Delay Time	$t_{d(off)}$			24.7		
Turn-Off Fall Time	$t_f$			10.7		

**Curve Characteristics**

Fig. 1 - Typical Output Characteristics

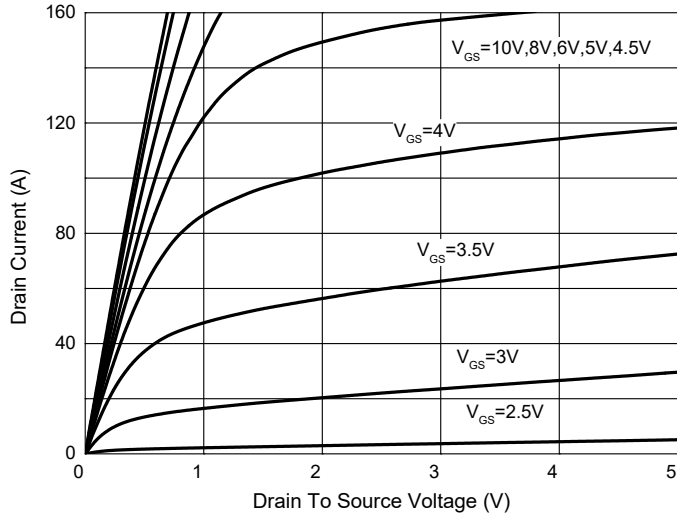


Fig. 2 - Transfer Characteristics

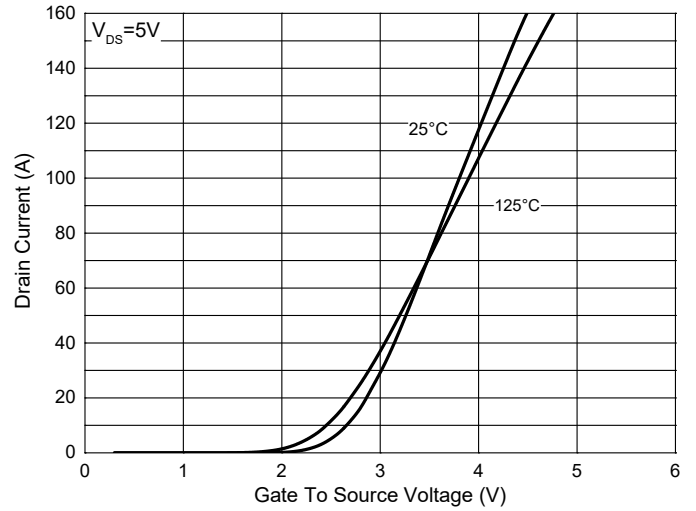


Fig. 3 -  $R_{DS(ON)} - V_{GS}$

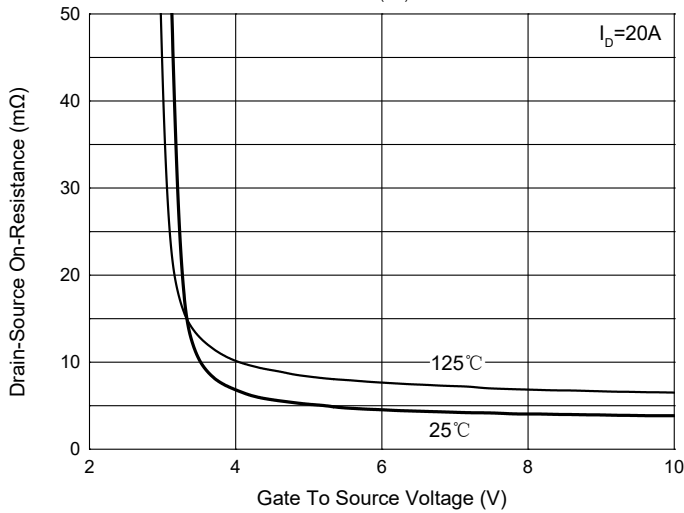


Fig. 4 -  $R_{DS(ON)} - I_D$

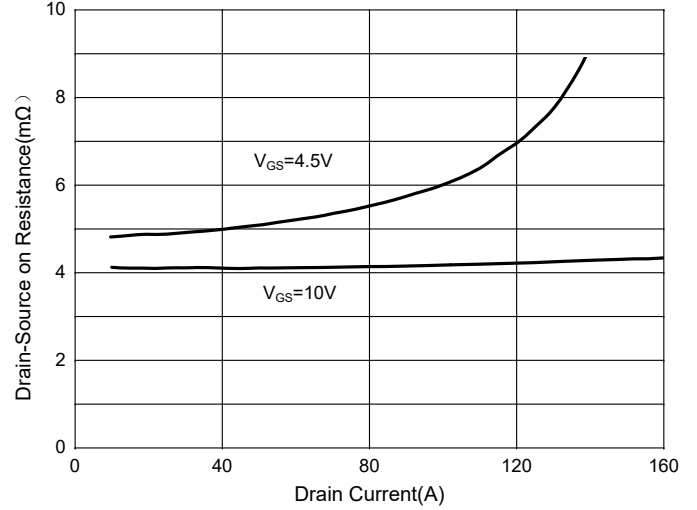


Fig. 5 - Capacitance Characteristics

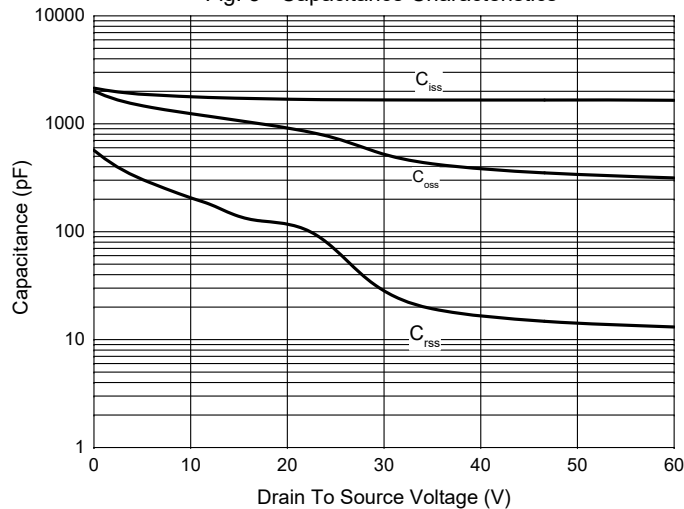
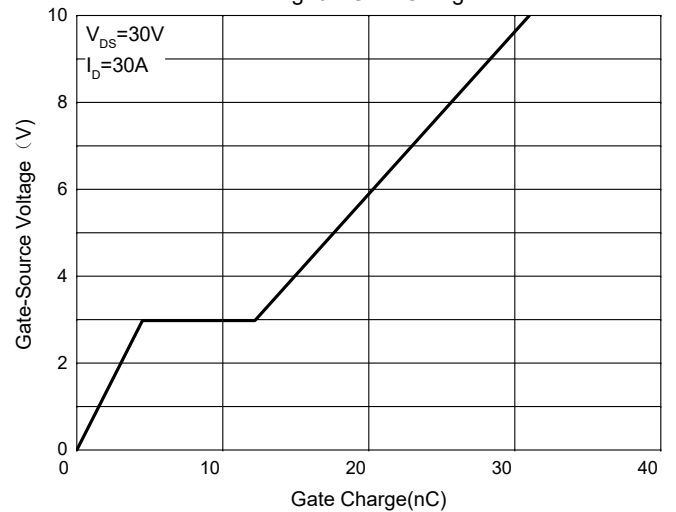


Fig. 6 - Gate Charge



**Curve Characteristics**

Fig. 7 - Normalized Threshold Voltage

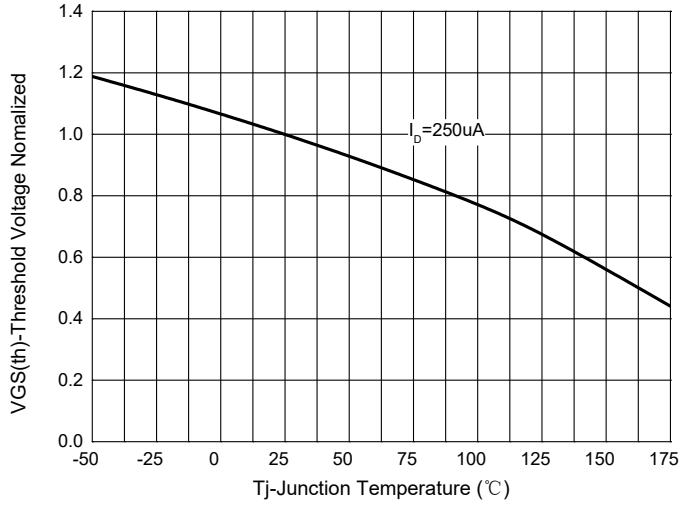


Fig.8-Normalized On Resistance Characteristics

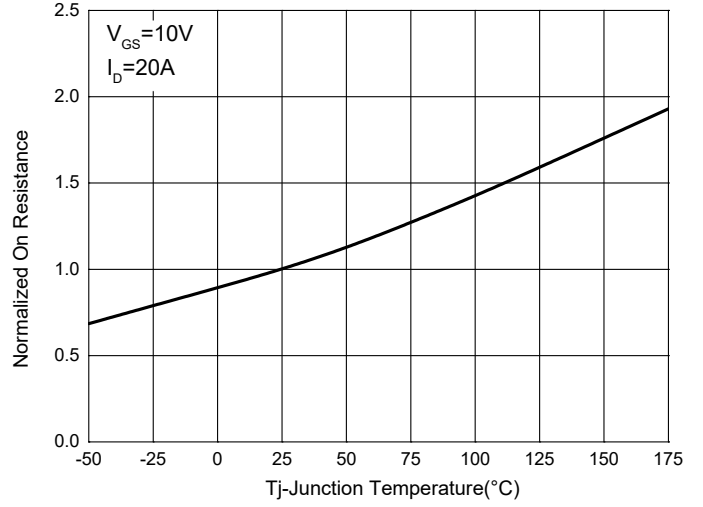


Fig.9 -  $I_s - V_{SD}$

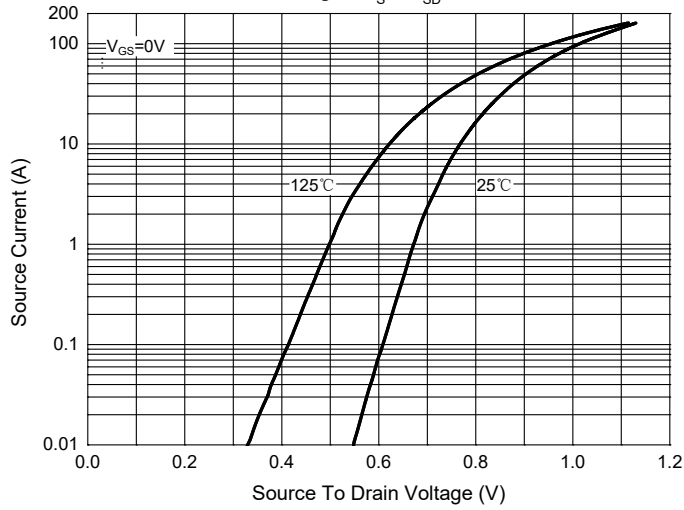


Fig. 10 - Drain Current

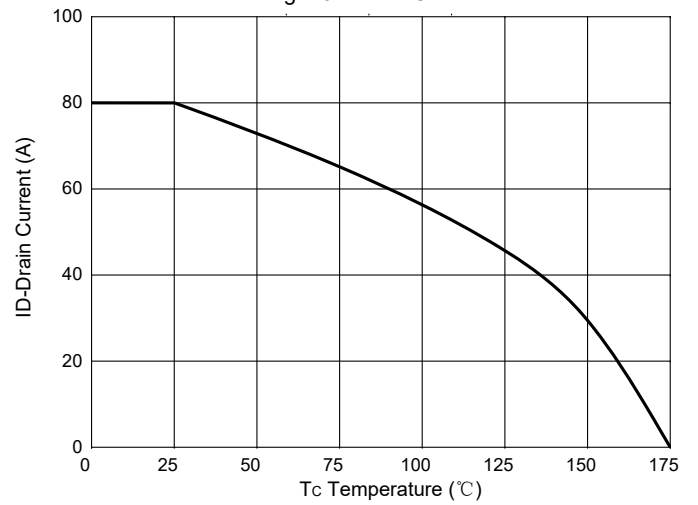
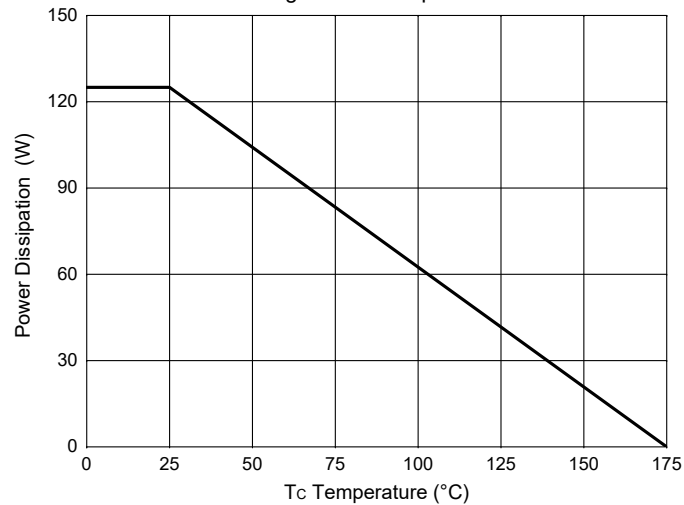


Fig.11-PD Dissipation



**Curve Characteristics**

Fig. 12 - Safe Operation Area

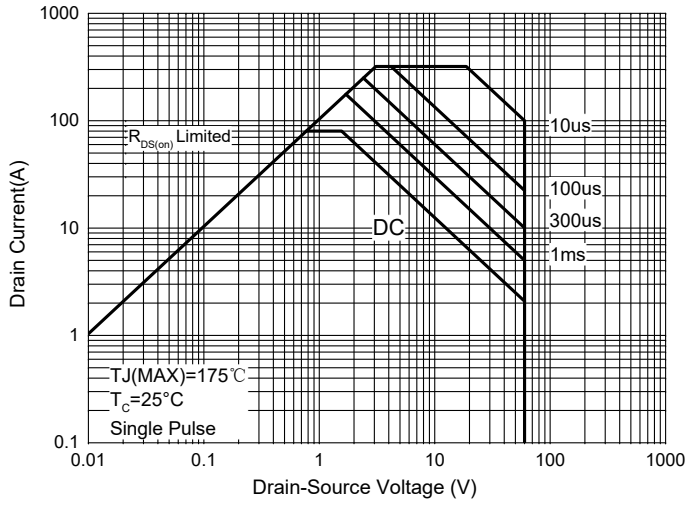
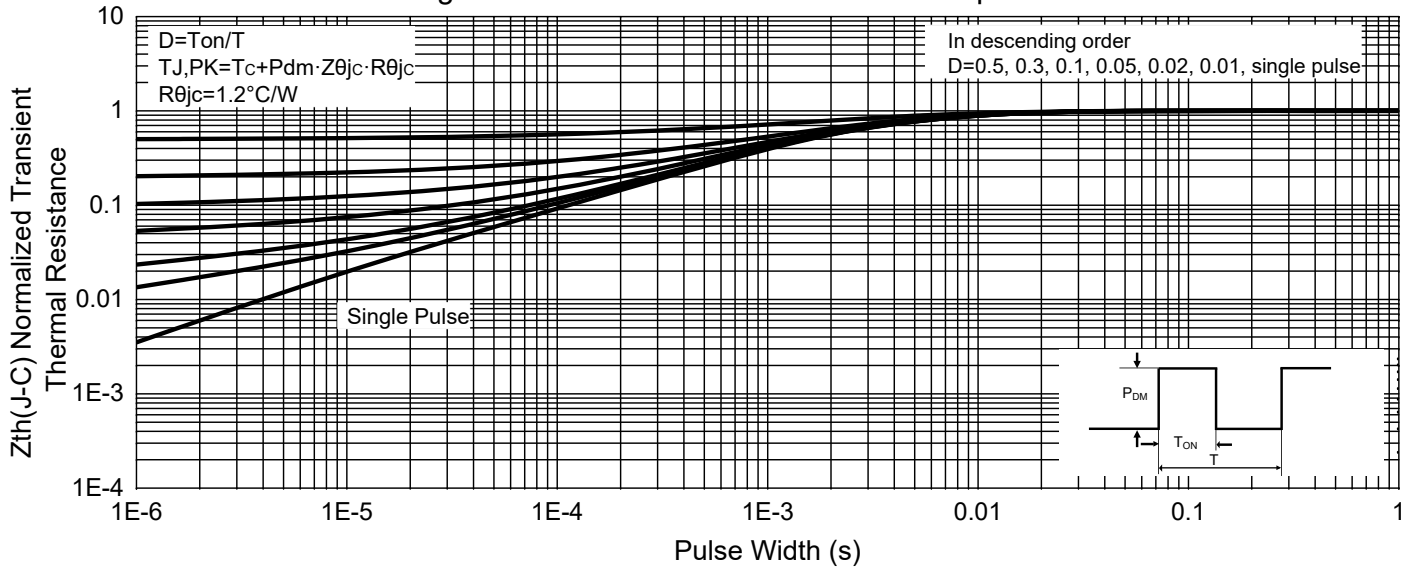


Fig. 13 - Normalized Transient Thermal Impedance



## Ordering Information

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

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