

## Features

- AEC-Q101 Qualified
- Split Gate Trench MOSFET Technology
- Low  $R_{DS(on)}$  & FOM
- 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

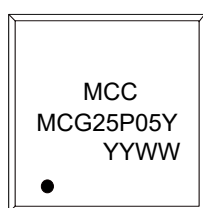
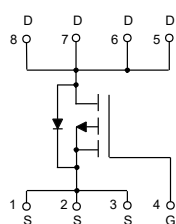
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 60°C/W Junction to Ambient (Steady-State) (Note 2)
- Thermal Resistance: 1.7°C/W Junction to Case (Steady-State)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-48	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	-25	A
		-16	
Pulsed Drain Current (Note 3)	$I_{DM}$	-100	A
Total Power Dissipation (Note 4)	$P_D$	74	W
Single Pulsed Avalanche Energy (Note 5)	$E_{AS}$	81	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.  $V_{GS} = -10\text{V}$ ,  $V_{DD} = -50\text{V}$ ,  $R_G = 25\Omega$ ,  $L = 0.5\text{mH}$ .

## Internal Structure and Marking Code

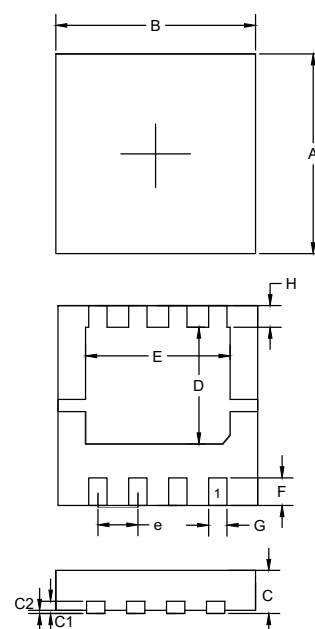


pin1

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

## P-CHANNEL MOSFET

### DFN3333



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.126	0.130	3.20	3.30	
B	0.126	0.130	3.20	3.30	
C	0.030	0.033	0.75	0.85	
C1	0.007	0.009	0.18	0.22	
C2	---	0.002	---	0.05	
D	0.071	0.079	1.80	2.00	
E	0.087	0.098	2.20	2.50	
F	0.016	0.020	0.40	0.50	
G	0.010	0.014	0.25	0.35	
H	0.012	0.016	0.30	0.40	
e	0.024	0.028	0.60	0.70	

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-48			V
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-48V, V <sub>GS</sub> =0V			-1	μA
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1.5	-2.1	-2.7	V
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A		35	45	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A		47	61	
Gate Resistance	R <sub>g</sub>	F=1 MHz, Open drain		12		Ω
Diode Characteristics						
Continuous Body Diode Current	I <sub>S</sub>				-25	A
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-20A			-1.3	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =-20A, dI <sub>F</sub> /dt=100A/μs		28.3		ns
Reverse Recovery Charge	Q <sub>rr</sub>			20.2		nC
Dynamic Characteristics						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-30V,V <sub>GS</sub> =0V,f=1MHz		1024		pF
Output Capacitance	C <sub>oss</sub>			386		
Reverse Transfer Capacitance	C <sub>rss</sub>			22		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-30V,V <sub>GS</sub> =-10V,I <sub>D</sub> =-20A		17.4		nC
Gate-Source Charge	Q <sub>gs</sub>			3.8		
Gate-Drain Charge	Q <sub>gd</sub>			3.0		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =-30V, V <sub>GS</sub> =-10V , R <sub>GEN</sub> =6Ω		7.9		ns
Turn-On Rise Time	t <sub>r</sub>			4.6		
Turn-Off Delay Time	t <sub>d(off)</sub>			42.4		
Turn-Off Fall Time	t <sub>f</sub>			15.7		

## Curve Characteristics

Fig. 1 - Typical Output Characteristics

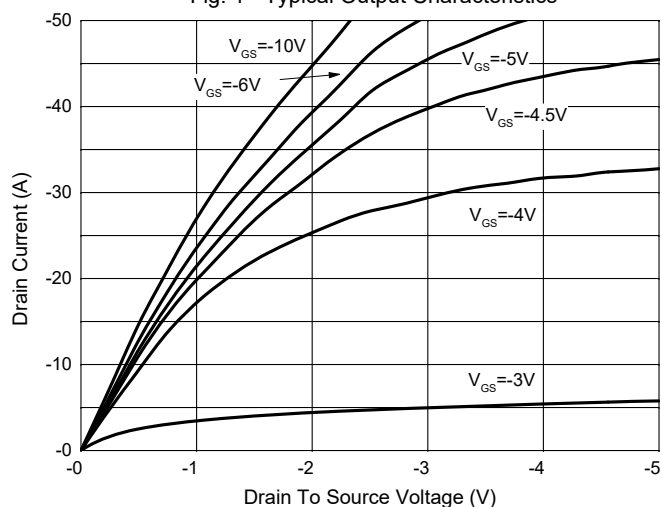


Fig. 2 - Transfer Characteristics

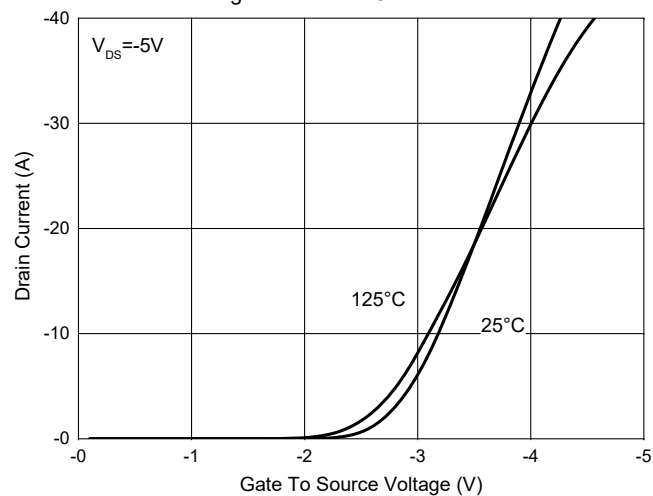


Fig. 3 -  $R_{DS(ON)}$  —  $V_{GS}$

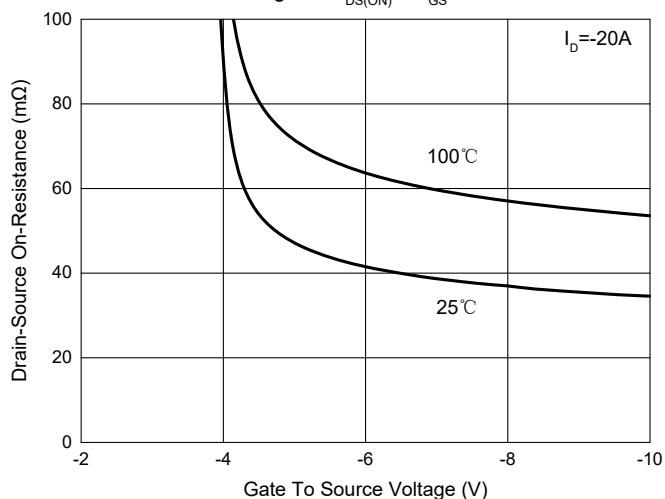


Fig. 4 -  $R_{DS(ON)}$  —  $I_D$

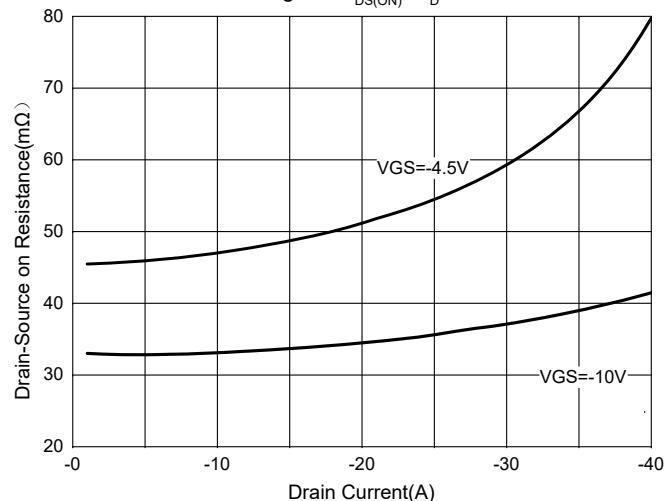


Fig. 5 - Capacitance Characteristics

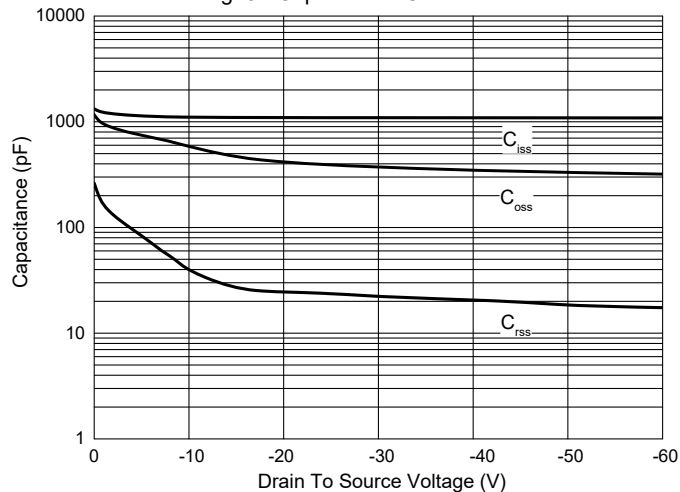
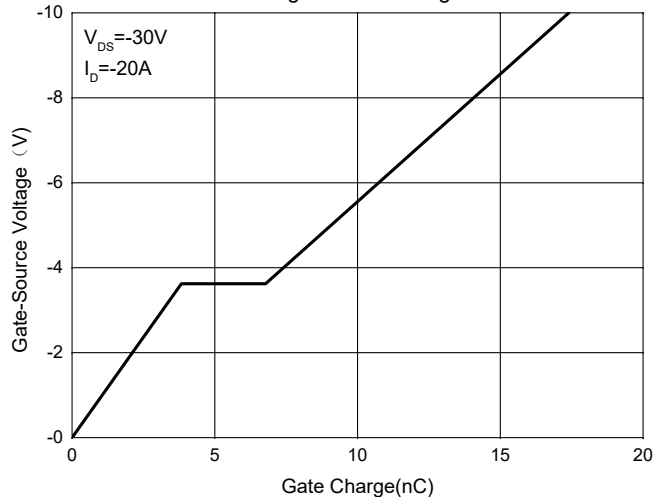


Fig. 6 - GateCharge



## Curve Characteristics

Fig. 7 - Normalized Threshold Voltage

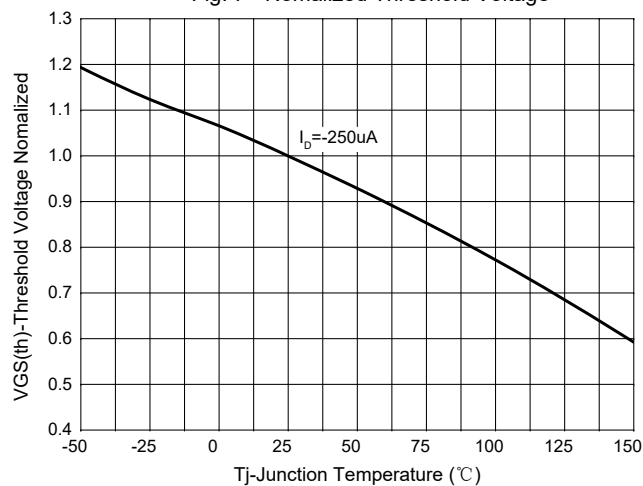


Fig.8-Normalized On Resistance Characteristics

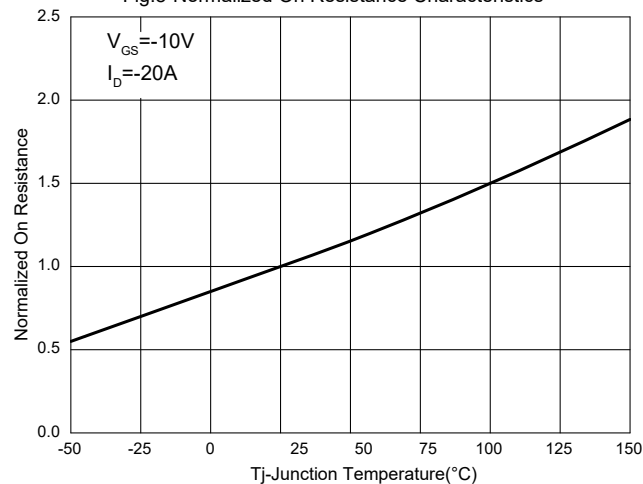


Fig. 9 -  $I_S - V_{SD}$

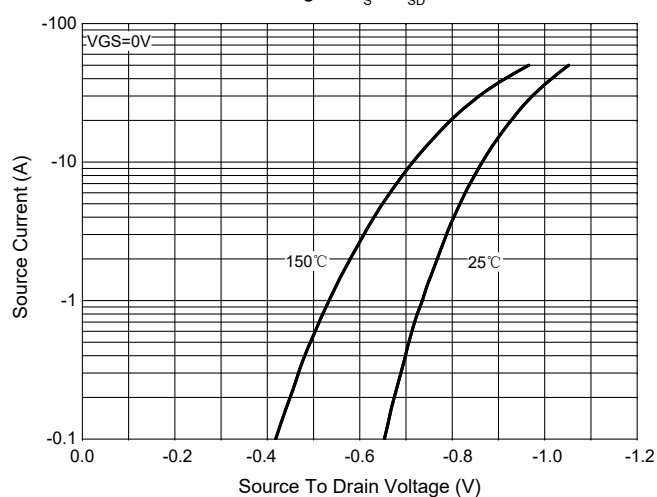


Fig. 10 - Drain Current

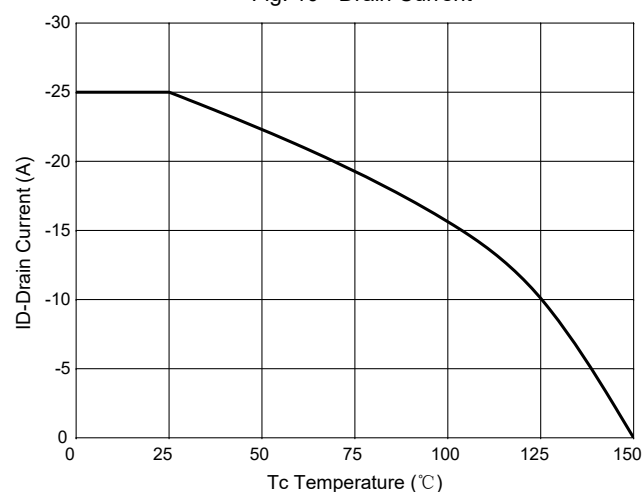
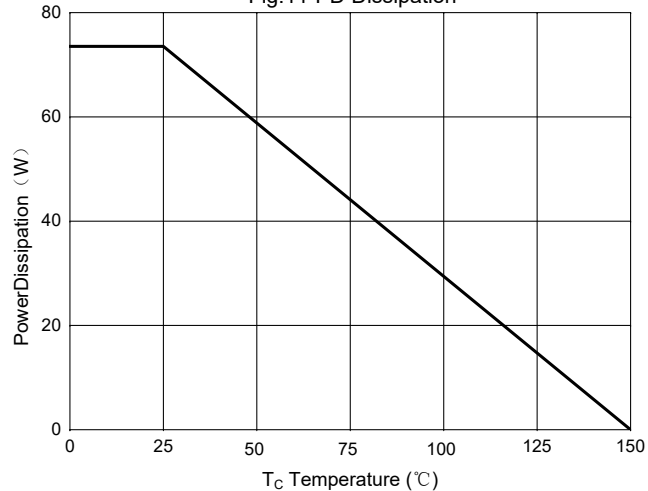


Fig.11-PD Dissipation



## Curve Characteristics

Fig. 12 - Safe Operation Area

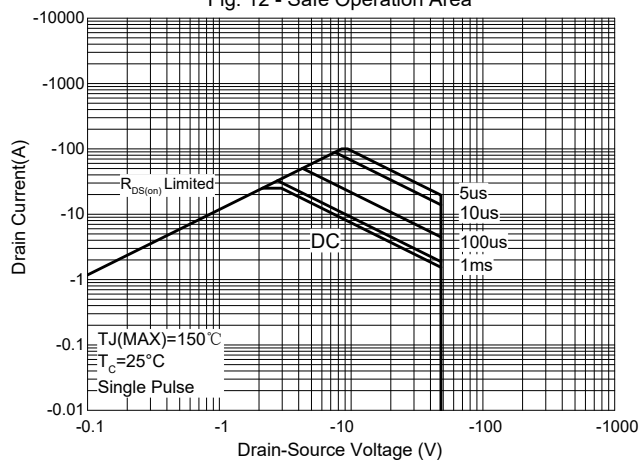
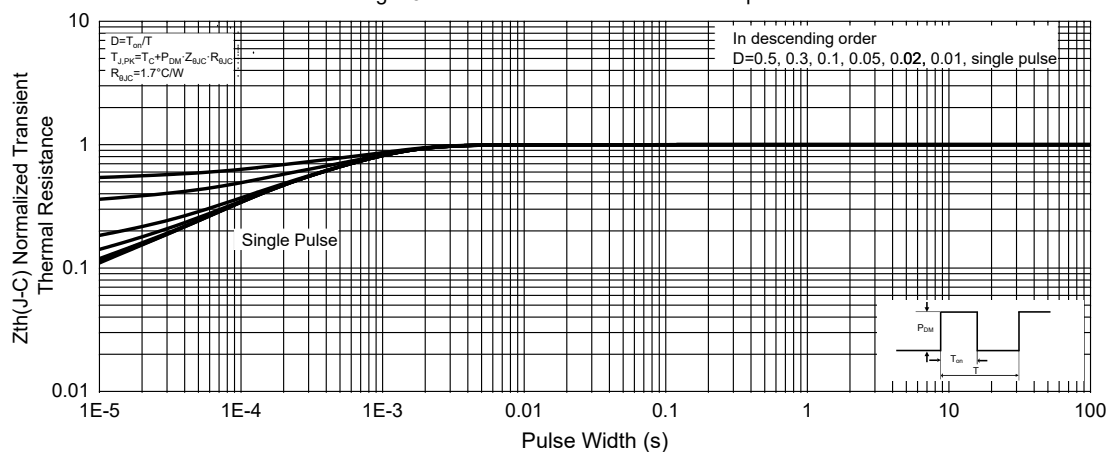


Fig. 13 - Normalized Transient Thermal Impedance



## Ordering Information

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

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