

### Features

- Trench Power MV MOSFET Technology
- Excellent Package for Heat Dissipation
- High Density Cell Design for Low  $R_{DS(on)}$
- 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)
- Moisture Sensitivity Level 3

### Maximum Ratings

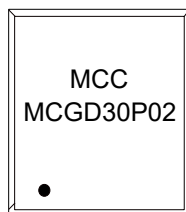
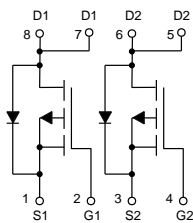
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 42°C/W Junction to Ambient <sup>(2)</sup>
- Thermal Resistance: 5.9°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	±10	V
Continuous Drain Current	$I_D$	$T_A=25^\circ\text{C}$	-30
		$T_A=100^\circ\text{C}$	-19
Pulsed Drain Current <sup>(3)</sup>	$I_{DM}$	-55	A
Total Power Dissipation	$P_D$	21	W
Single Pulsed Avalanche Energy	$E_{AS}$	31	mJ

Note:

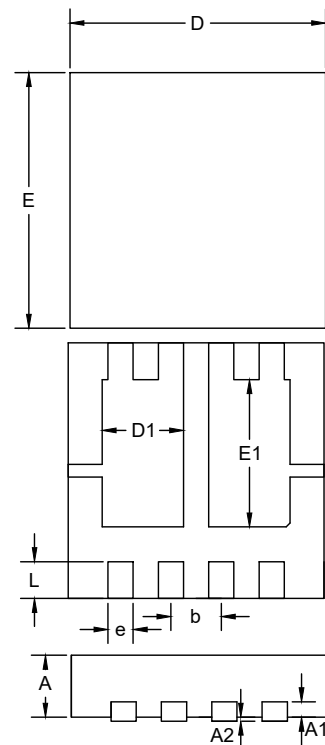
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Repetitive Rating: Pulse width limited by maximum junction temperature.

### Internal Structure and Marking Code



## Dual P-CHANNEL MOSFET

### DFN3333-D



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.030	0.033	0.750	0.850	
A1	0.008		0.200		TYP
A2	-	0.002	-	0.050	
D	0.128	0.132	3.250	3.350	
E	0.128	0.132	3.250	3.350	
D1	0.039	0.043	1.000	1.100	
E1	0.073	0.077	1.850	1.950	
b	0.026		0.650		BSC
e	0.012	0.014	0.300	0.350	
L	0.017	0.021	0.425	0.525	

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 10V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V$			-1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.62	-1.0	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-15A$		11	19	m $\Omega$
		$V_{GS}=-2.5V, I_D=-8A$		14	22	
		$V_{GS}=-1.8V, I_D=-6A$		20	30	
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				-30	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-30A$		-0.8	-1.2	V
Reverse Recovery Time	$t_{rr}$	$I_S=-6A, di/dt=100A/\mu s$		67		ns
Reverse Recovery Charge	$Q_{rr}$			34		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-10V, V_{GS}=0V, f=1MHz$		2992		pF
Output Capacitance	$C_{oss}$			330		
Reverse Transfer Capacitance	$C_{riss}$			272		
Total Gate Charge	$Q_g$	$V_{DS}=-15V, V_{GS}=-10V, I_D=-9.1A$		72.8		nC
Gate-Source Charge	$Q_{gs}$			6.6		
Gate-Drain Charge	$Q_{gd}$			10.1		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=-15V, V_{GS}=-10V, R_G=2.5\Omega, I_D=-6A$		7		ns
Turn-On Rise Time	$t_r$			33		
Turn-Off Delay Time	$t_{d(off)}$			130		
Turn-Off Fall Time	$t_f$			132		

**Curve Characteristics**

Fig. 1 - Typical Output Characteristics

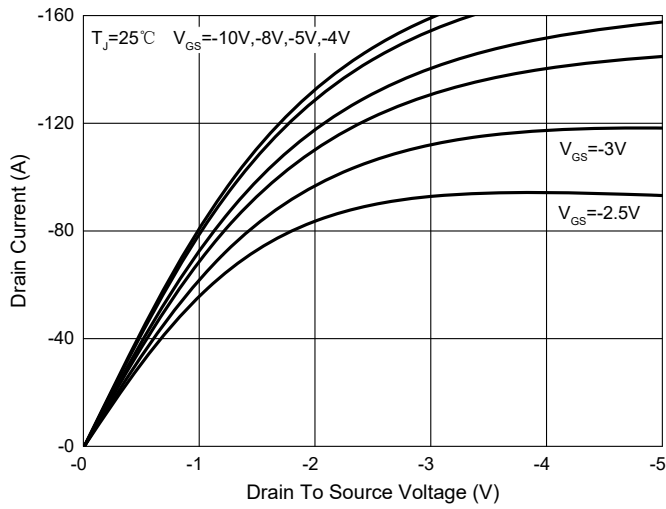


Fig. 2 - Transfer Characteristics

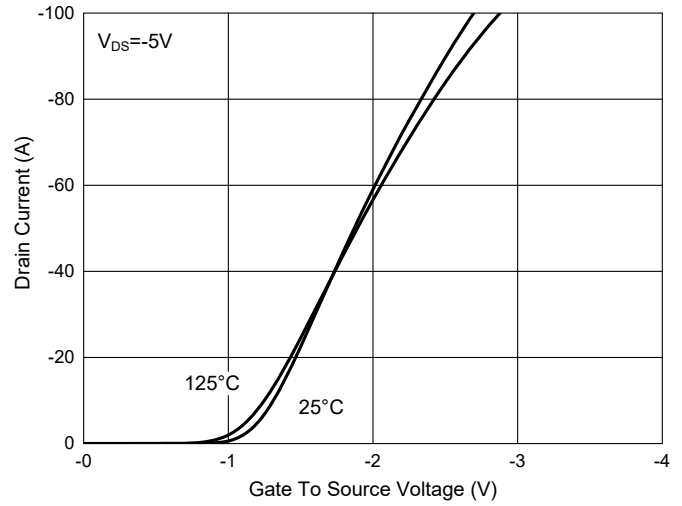


Fig. 3 -  $R_{DS(ON)} - I_D$

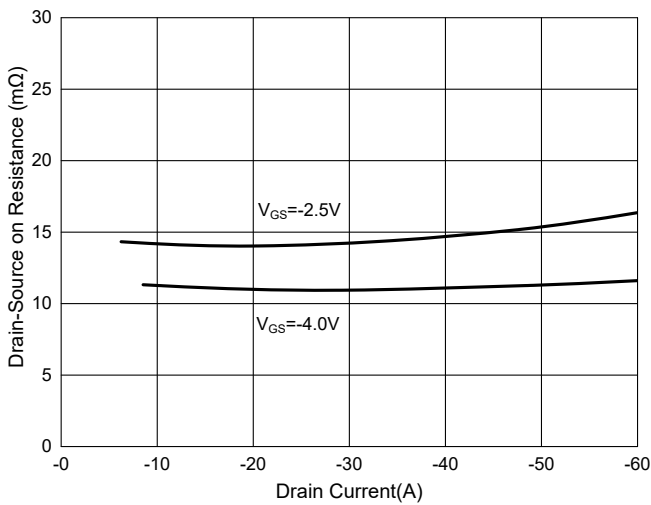


Fig. 4 - Normalized On Resistance Characteristics

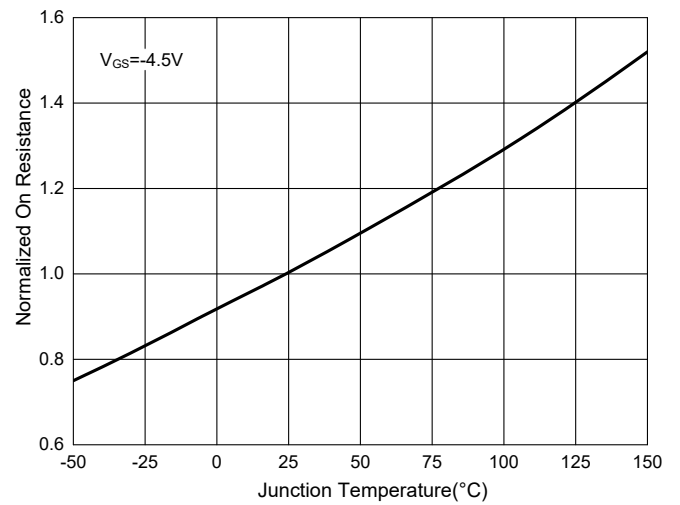


Fig. 5 - Capacitance Characteristics

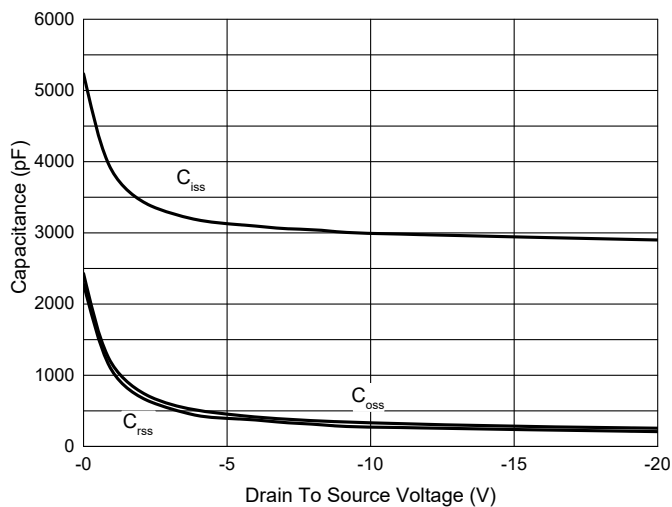
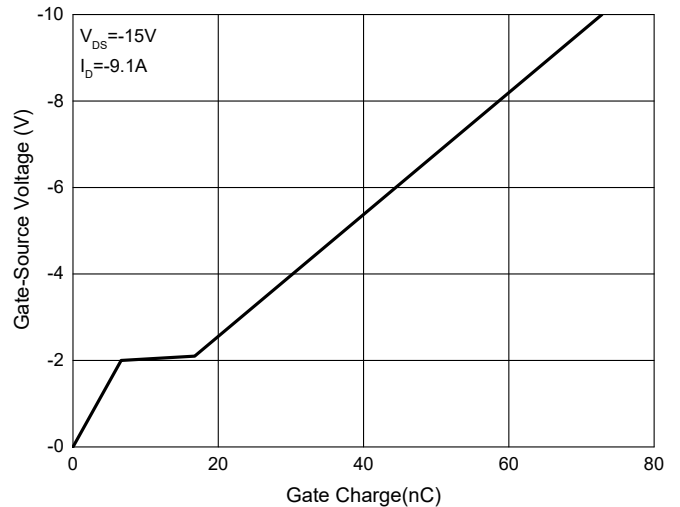


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - Safe Operation Area

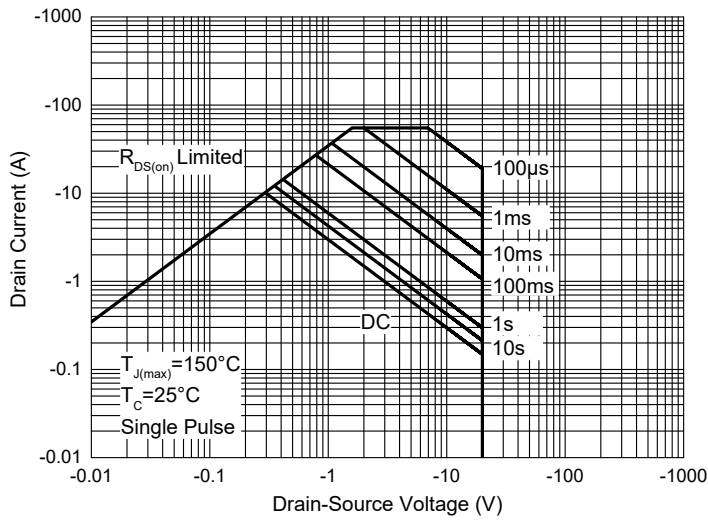
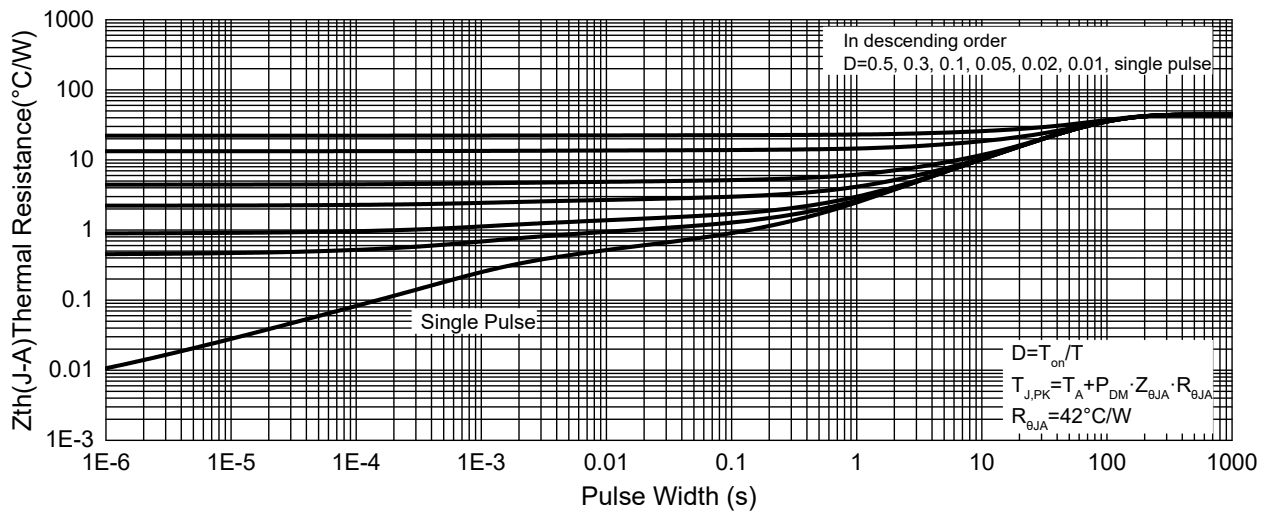


Fig. 8 - Maximum Transient Thermal Impedance



## Ordering Information

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

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