

Features

- Split Gate Trench MOSFET Technology
- Excellent Package For Heat Dissipation
- 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

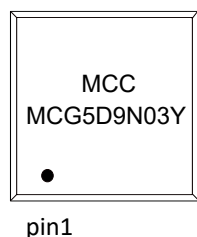
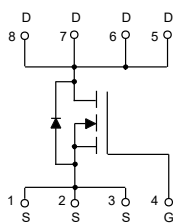
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 60°C/W Junction to Ambient (Note 2)
- Thermal Resistance: 5.6°C/W Junction to Case

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	45	A
	$T_C = 100^\circ\text{C}$		28	
Pulsed Drain Current (Note 3)		I_{DM}	180	A
Total Power Dissipation (Note 4)		P_D	22	W
Single Pulsed Avalanche Energy (Note 5)		E_{AS}	30	mJ

Note:

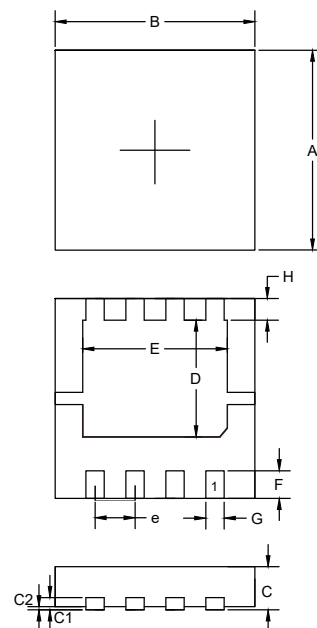
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.
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. $T_J = 25^\circ\text{C}$, $V_{DD} = 15\text{V}$, $V_{GS} = 10\text{V}$, $R_G = 25\Omega$, $L = 0.5\text{mH}$.

Internal Structure and Marking Code



N-CHANNEL MOSFET

DFN3333



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 _{(BR)DSS}	V _{GS} =0V, I _D =250μA	30			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =24V, V _{GS} =0V			1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.2	1.8	2.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		4.5	5.9	mΩ
		V _{GS} =4.5V, I _D =10A		8.0	11	
Gate Resistance	R _g	f=1 MHz, Open drain		1.0		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				45	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =20A			1.2	V
Reverse Recovery Time	t _{rr}	I _F =10A, dI _F /dt=100A/μs		22		ns
Reverse Recovery Charge	Q _{rr}			9		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1MHz		594		pF
Output Capacitance	C _{oss}			491		
Reverse Transfer Capacitance	C _{rss}			43		
Total Gate Charge	Q _g	V _{DS} =15V, V _{GS} =10V, I _D =15A		12.4		nC
Gate-Source Charge	Q _{gs}			2		
Gate-Drain Charge	Q _{gd}			3.5		
Turn-On Delay Time	t _{d(on)}	V _{DD} =15V, V _{GS} =10V, I _{DS} =15A, R _G =2.7Ω		7.4		ns
Turn-On Rise Time	t _r			59		
Turn-Off Delay Time	t _{d(off)}			14.7		
Turn-Off Fall Time	t _f			3.6		

Curve Characteristics

Fig.1 - Typical Output Characteristics

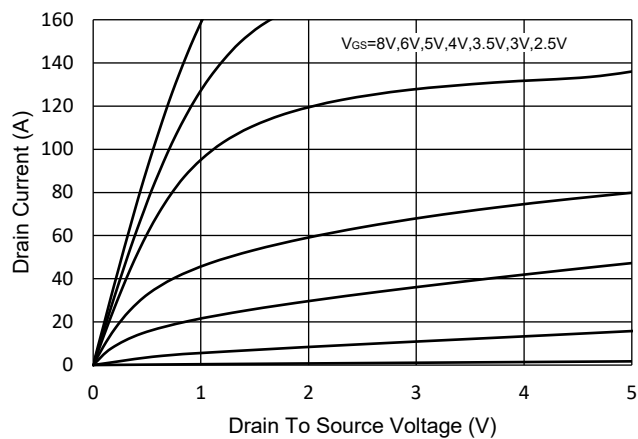


Fig.2 - Transfer Characteristic

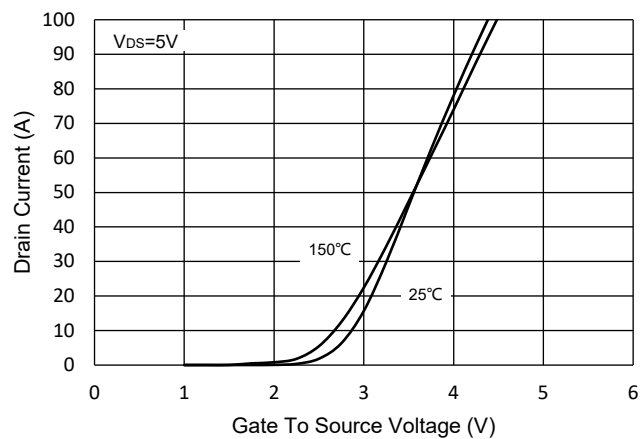


Fig.3 - $R_{DS(ON)}$ - V_{GS}

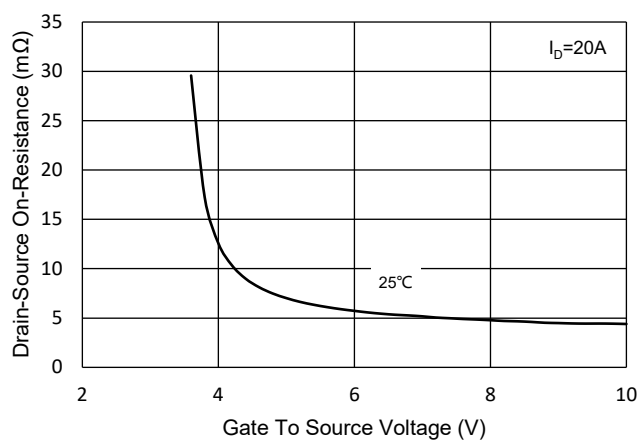


Fig.4 - $R_{DS(ON)}$ - I_D

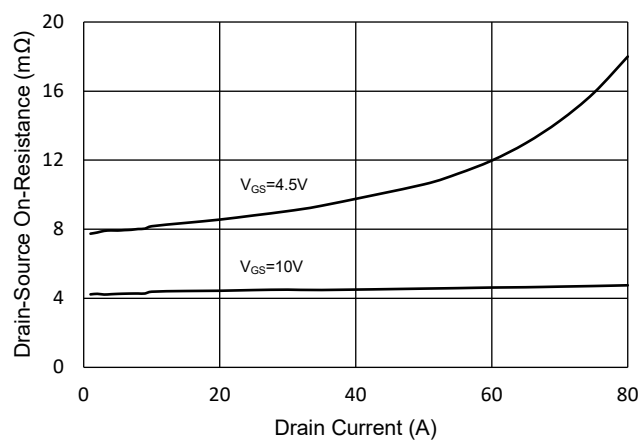


Fig.5 - Capacitance Characteristics

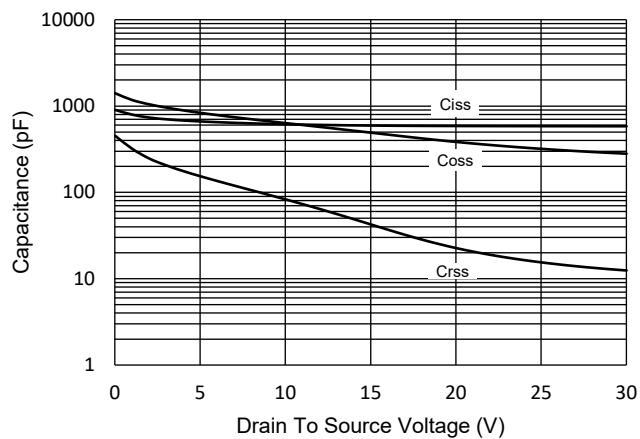
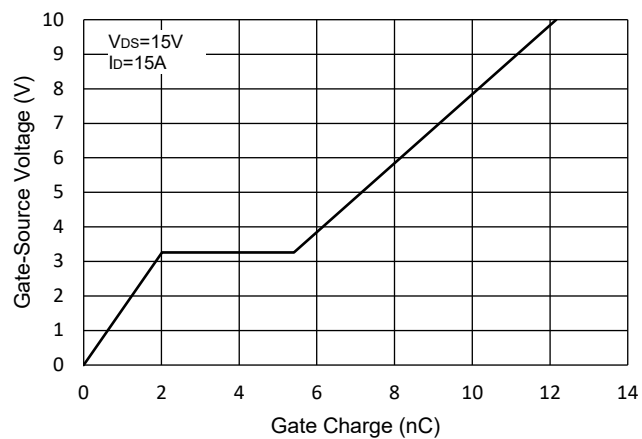


Fig.6 - Gate Charge



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

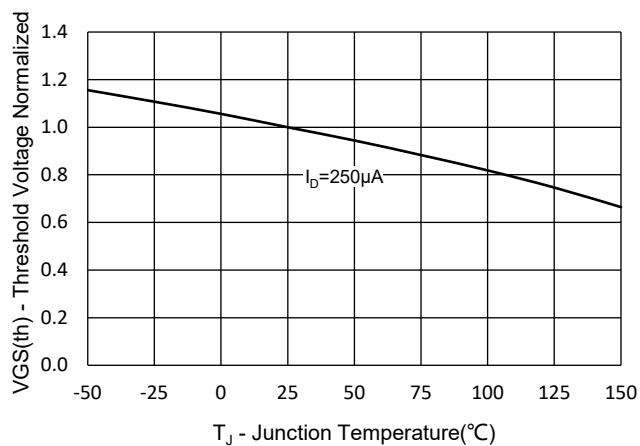


Fig.8 - Normalized On Resistance Characteristics

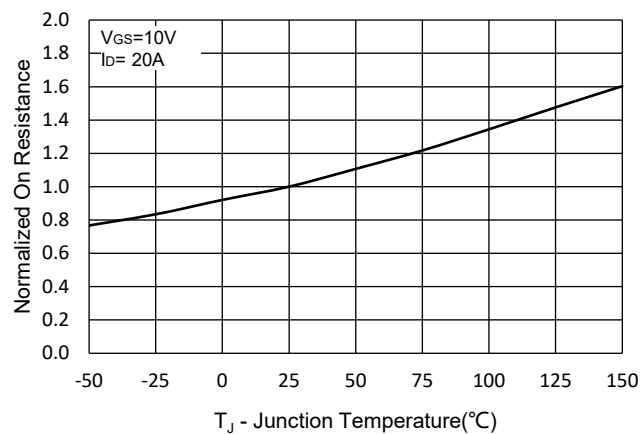


Fig.9 - $I_S - V_{SD}$

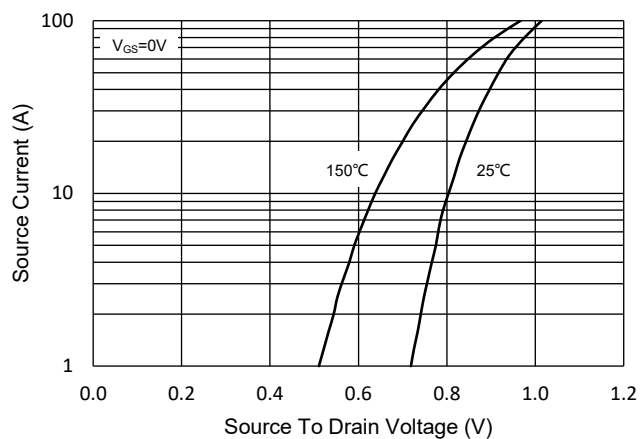


Fig.10 - Drain Current

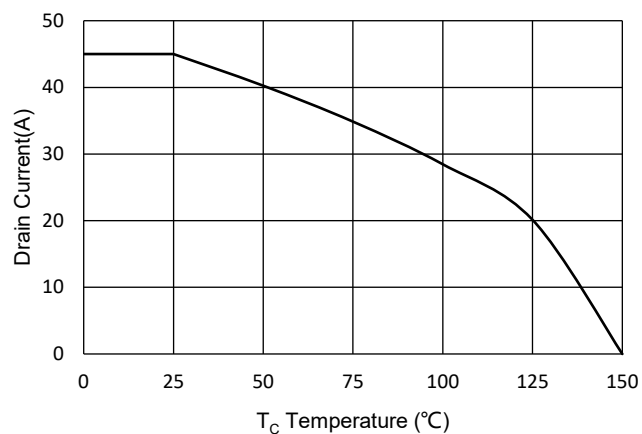
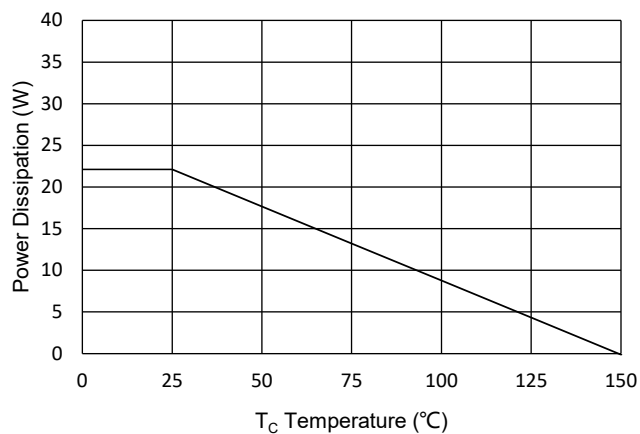


Fig.11 - PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

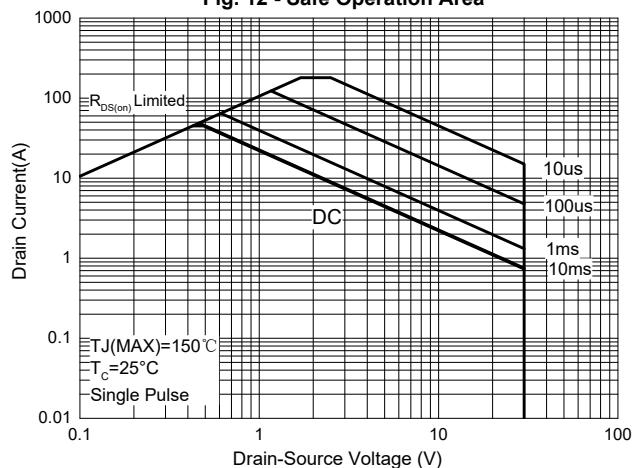
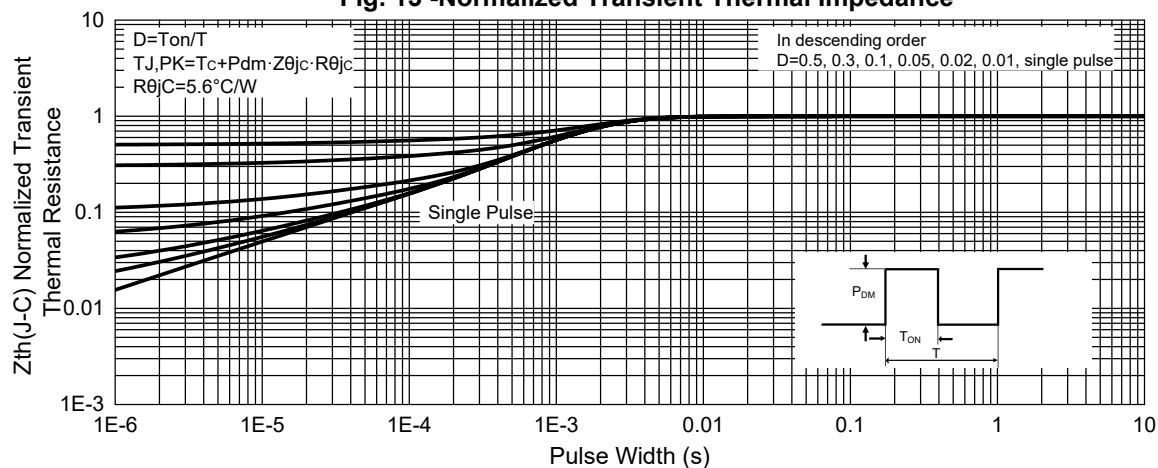


Fig. 13 - Normalized Transient Thermal Impedance



Ordering Information

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

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