

Features

- Trench Power LV MOSFET Technology
- High Speed Switching
- 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

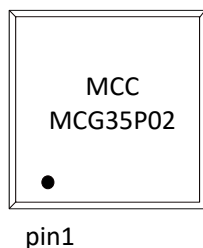
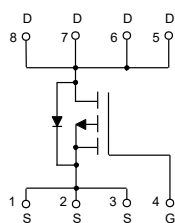
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 122°C/W Junction to Ambient (Note 2)
- Thermal Resistance: 1.8°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±10	V
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$	A
		$T_C=100^\circ\text{C}$	
Pulsed Drain Current (Note 3)	I_{DM}	-140	A
Total Power Dissipation (Note 4)	P_D	69	W
Single Pulse Avalanche Energy (Note 5)	E_{AS}	98	mJ

Note:

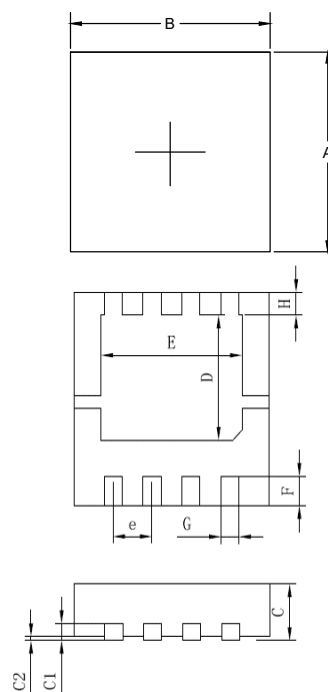
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in² pad of 2oz copper.
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. $T_J=25^\circ\text{C}$, $V_{DD}=-25\text{V}$, $V_{GS}=-10\text{V}$, $L=1\text{mH}$, $I_{AS}=-14\text{A}$

Internal Structure and Marking Code



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 _{(BR)DSS}	V _{GS} =0V, I _D =-250μA	-20			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±10V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V			-1.0	uA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.4	-0.64	-1.0	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-4.5V, I _D =-20A		10	14	mΩ
		V _{GS} =-2.5V, I _D =-15A		13	18	
		V _{GS} =-1.8V, I _D =-10A		19	29	
Gate Resistance	R _g	F=1 MHz, Open drain		14		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				-35	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-20A			-1.2	V
Reverse Recovery Time	t _{rr}	I _F =-17A, dI _F /dt=100A/μs		80		ns
Reverse Recovery Charge	Q _{rr}			76		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =-10V, V _{GS} =0V, f=1MHz		2100		pF
Output Capacitance	C _{oss}			270		
Reverse Transfer Capacitance	C _{rss}			241		
Total Gate Charge	Q _g	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-17A		23.5		nC
Gate-Source Charge	Q _{gs}			3.3		
Gate-Drain Charge	Q _{gd}			5.9		
Turn-On Delay Time	t _{d(on)}	V _{DS} =-10V, V _{GS} =-4.5V, R _G =6Ω, I _{DS} =-17A		9		ns
Turn-On Rise Time	t _r			15		
Turn-Off Delay Time	t _{d(off)}			147		
Turn-Off Fall Time	t _f			87		

Curve Characteristics

Fig. 1 - Typical Output Characteristics

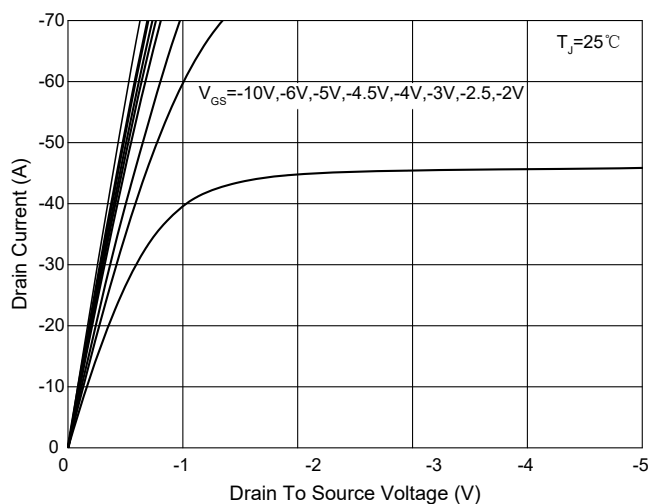


Fig. 2 - Transfer Characteristics

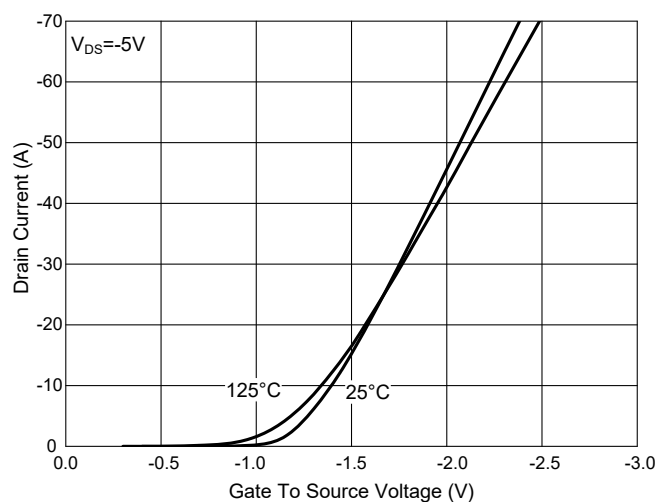


Fig. 3 - $R_{DS(ON)} - V_{GS}$

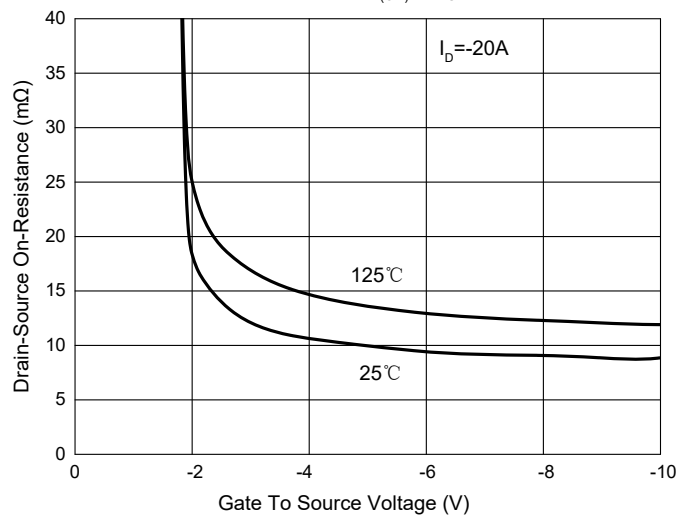


Fig. 4 - Normalized On Resistance Characteristics

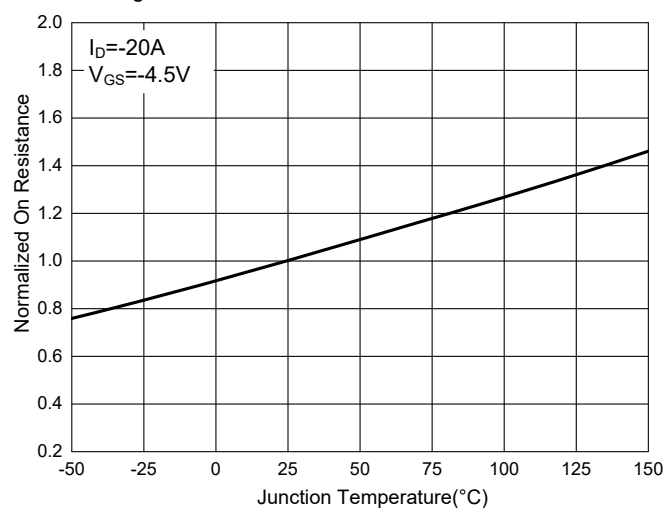


Fig. 5 - Capacitance Characteristics

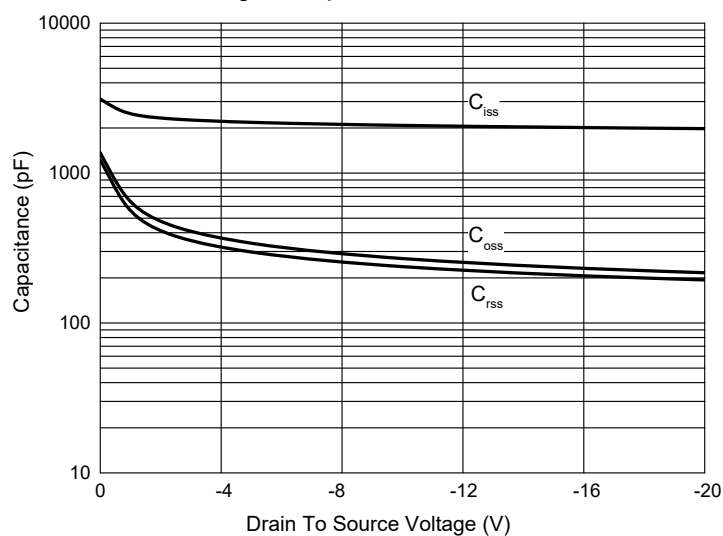
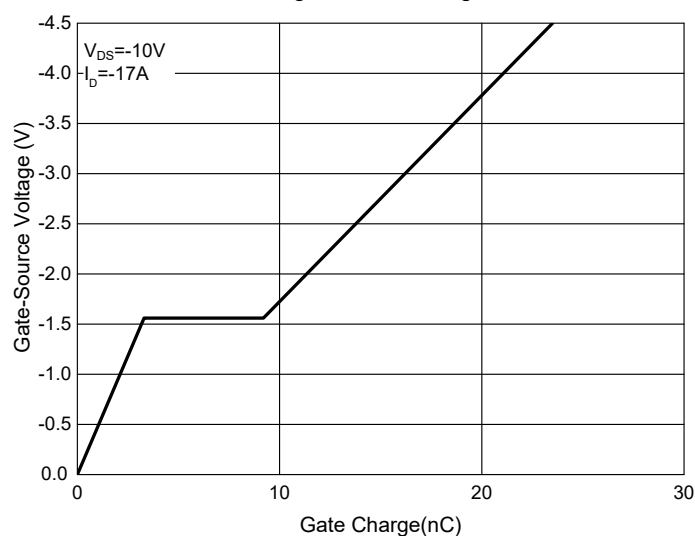


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - $R_{DS(ON)} - I_D$

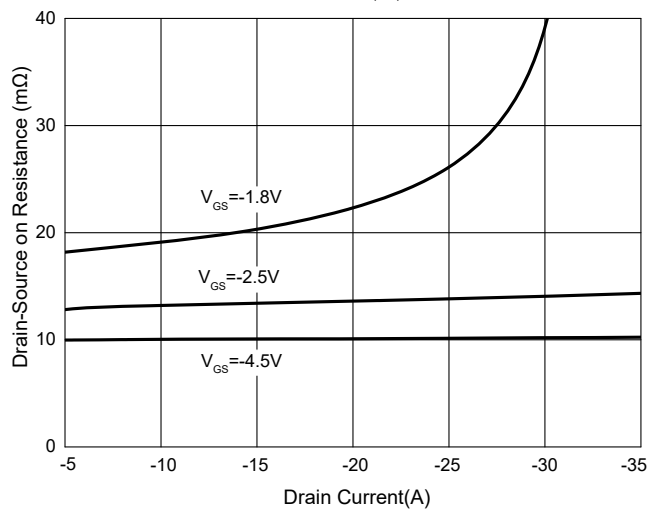


Fig. 8 - Normalized Threshold voltage

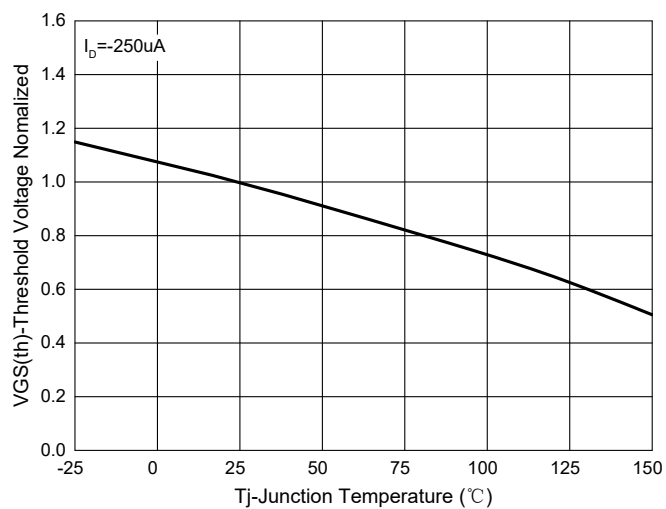


Fig. 9 - $I_S - V_{SD}$

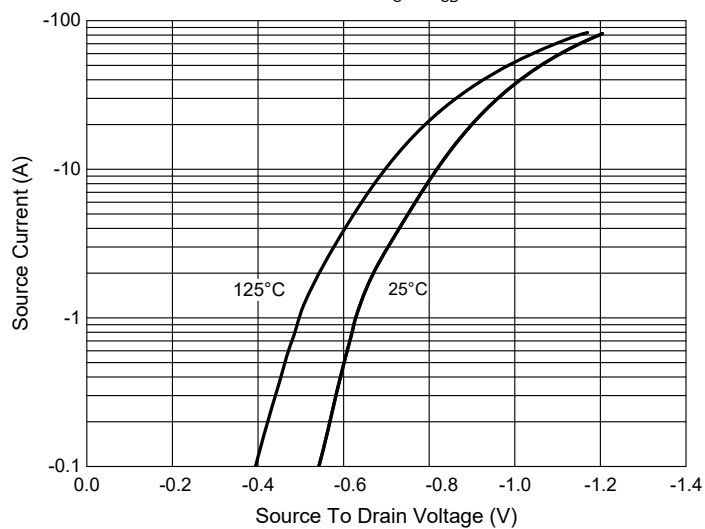


Fig. 10 - Current dissipation

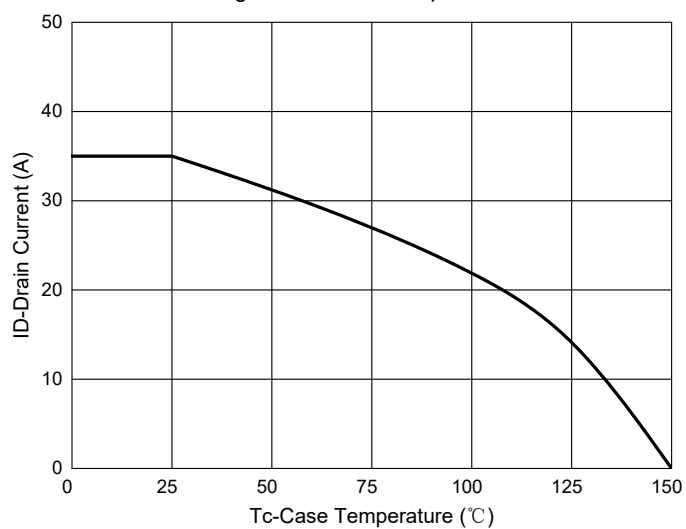
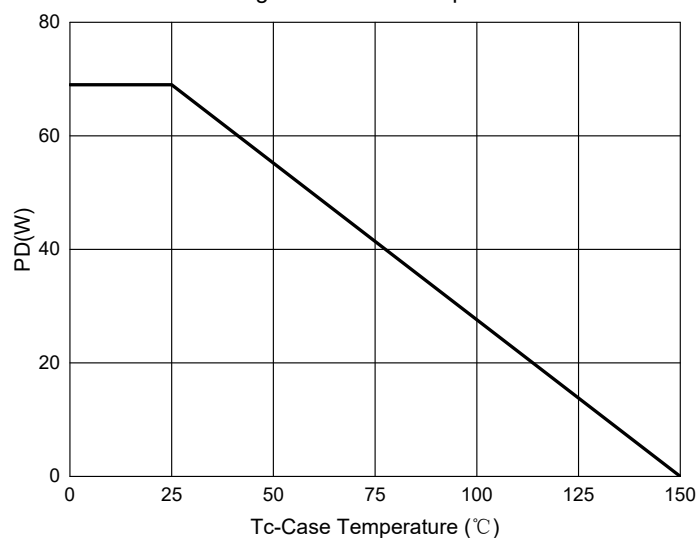


Fig. 11 - Power Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

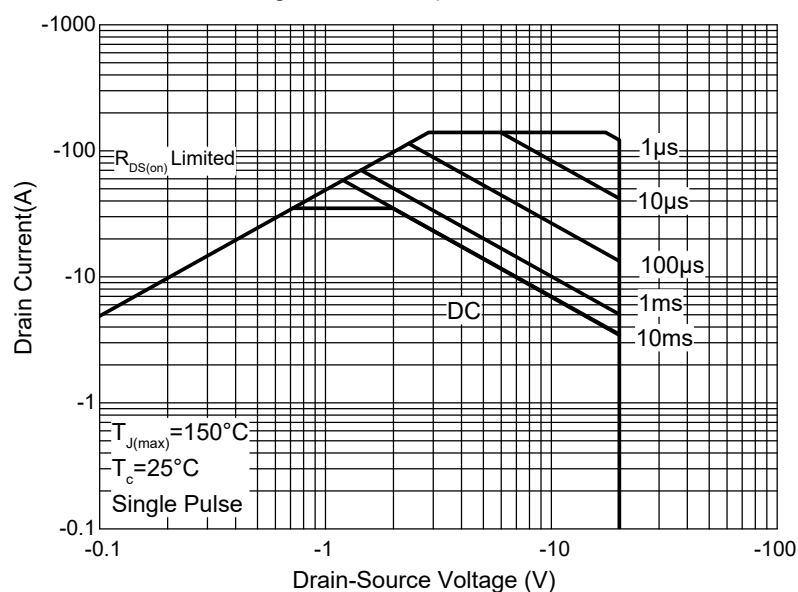
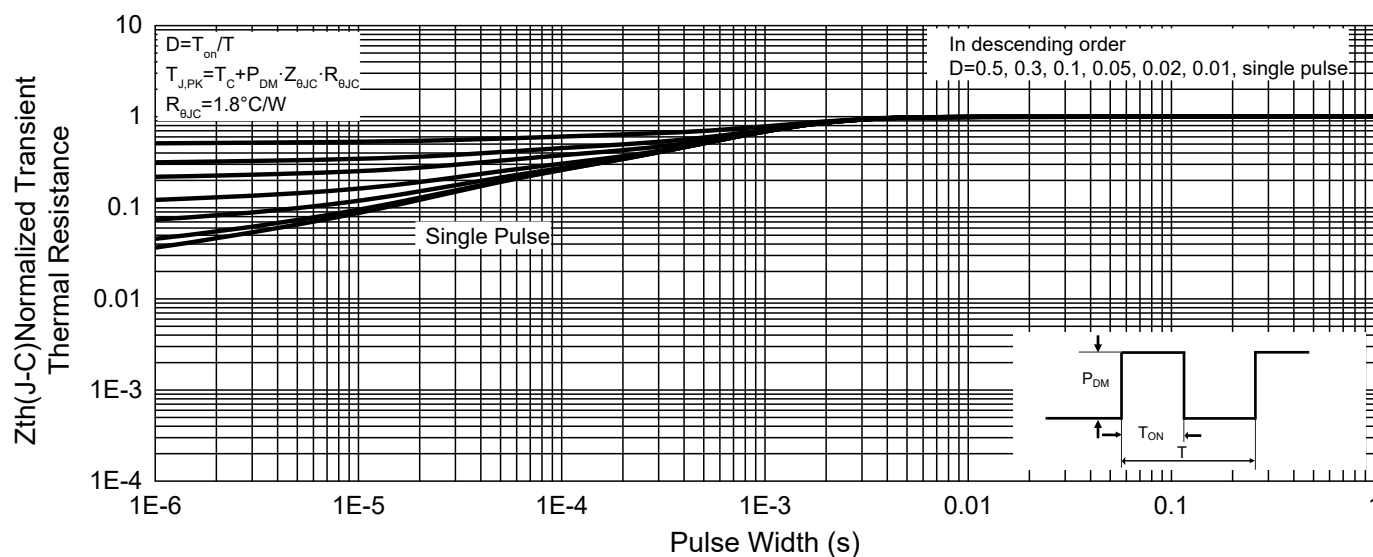


Fig. 13 - Normalized Transient Thermal Impedance



Ordering Information

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

Revision History

Datasheet status	Version No	Release date	Update content
New product datasheet	Rev4-1	20230103	

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