

Features

- ESD Protected Up To 2KV (HBM)
- Low Threshold Voltage
- 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

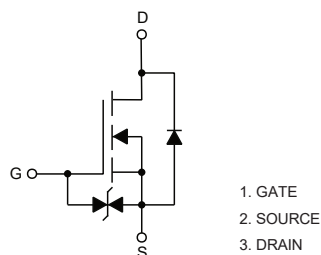
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature: -55°C to +150°C
- Maximum Thermal Resistance: 382°C/W Junction to Ambient (Note 2)

Parameter	Symbol	Rating	Unit
Drain -source Voltage	V_{DS}	60	V
Gate -Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	$T_A=25^\circ\text{C}$	A
		$T_A=70^\circ\text{C}$	
Pulsed Drain Current	I_{DM}	1.04	A
Power Dissipation	P_D	0.33	W

Note:

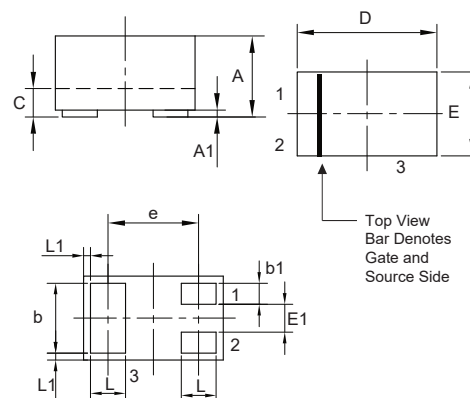
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. P_D is based on max. junction temperature, using junction-ambient thermal resistance.

Internal Structure and Marking Code



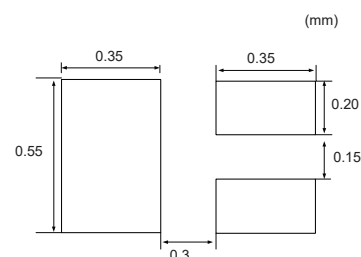
N-Channel MOSFET

DFN1006-3



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.017	0.022	0.42	0.55	
A1	0.000	0.002	0.00	0.05	
b	0.018	0.022	0.45	0.55	
b1	0.004	0.008	0.10	0.20	
c	0.005	0.007	0.12	0.18	
D	0.037	0.041	0.95	1.05	
E	0.022	0.026	0.55	0.65	
E1	0.006	0.010	0.15	0.25	
e	0.026 BSC		0.65BSC		
L	0.008	0.012	0.20	0.30	
L1	0.0002 REF		0.05 REF		

Suggested Solder Pad Layout



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	60			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±10	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =300mA		1.8	2.5	Ω
		V _{GS} =4.5V, I _D =200mA		2.0	3.0	
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =200mA		300		mS
Gate Resistance	R _g	f=1 MHz, Open drain		100		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				0.26	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =300mA			1.2	V
Reverse Recovery Time	t _{rr}	I _F =0.3A, dI _F /dt=100A/μs		10		ns
Reverse Recovery Charge	Q _{rr}			2.6		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz		15		pF
Output Capacitance	C _{oss}			3		
Reverse Transfer Capacitance	C _{rss}			2		
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =10V, I _D =0.3A		0.9		nC
Gate-Source Charge	Q _{gs}			0.15		
Gate-Drain Charge	Q _{gd}			0.25		
Turn-On Delay Time	t _{d(on)}	V _{DD} =50V, V _{GS} =10V , R _G =50Ω, I _D =0.3A		3		ns
Turn-On Rise Time	t _r			3.8		
Turn-Off Delay Time	t _{d(off)}			10		
Turn-Off Fall Time	t _f			30		

Curve Characteristics

Fig.1 - Typical Output Characteristics

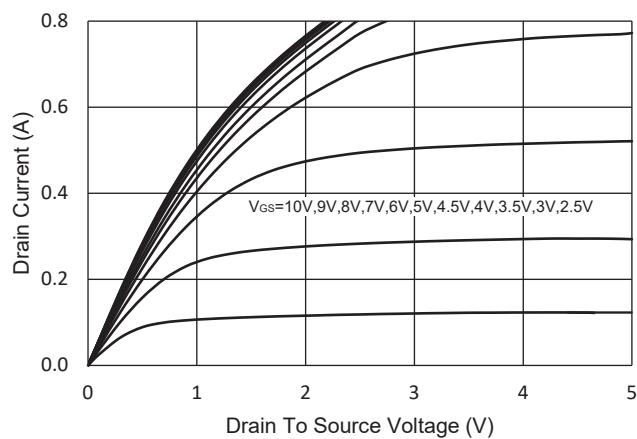


Fig. 2 - Transfer Characteristics

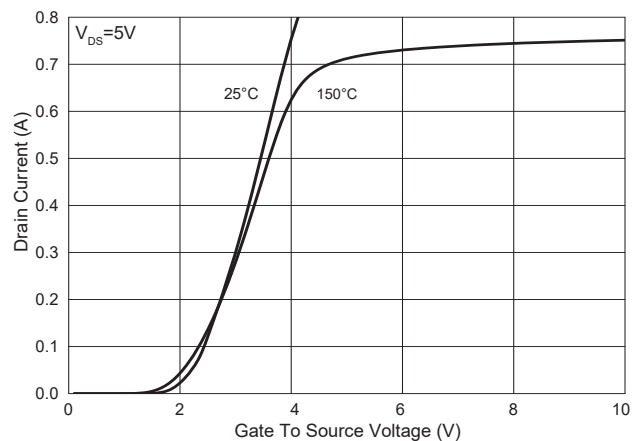


Fig. 3 - $R_{DS(ON)} - V_{GS}$

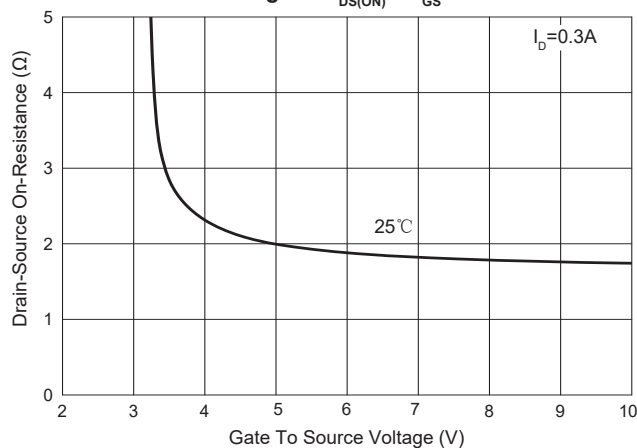


Fig. 4 - $R_{DS(ON)} - I_D$

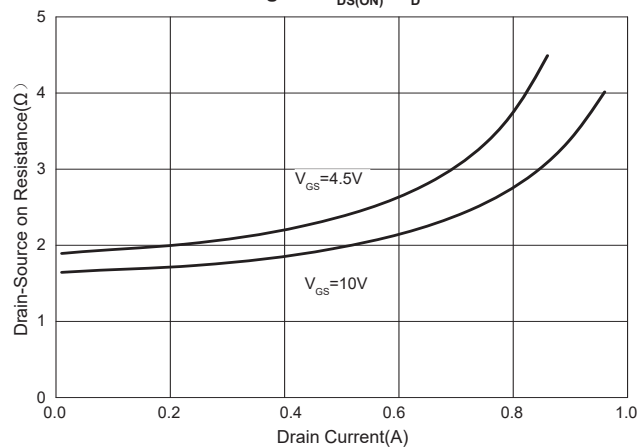


Fig. 5 - Capacitance Characteristics

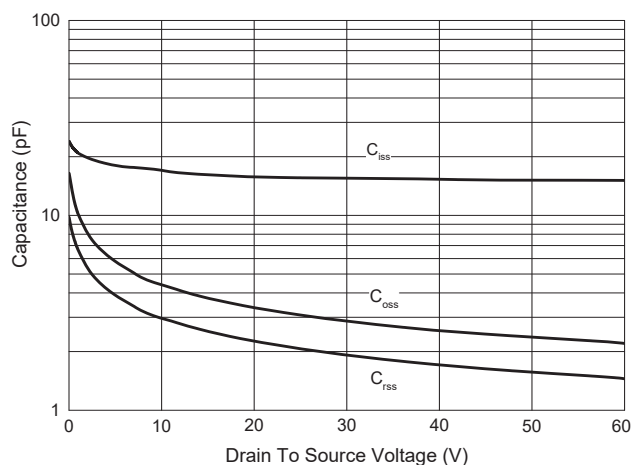
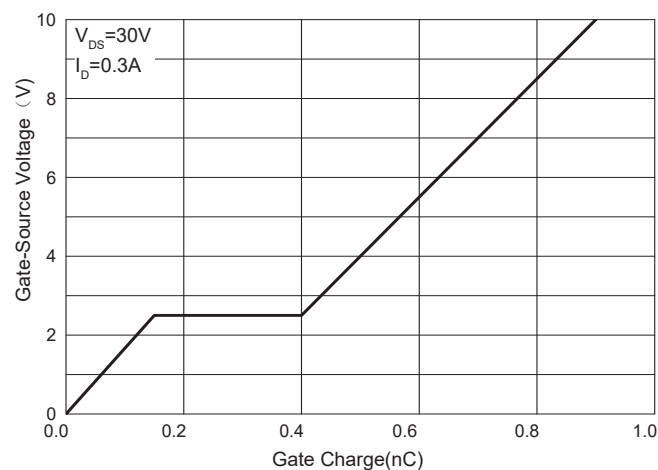


Fig. 6 - Gate Charge



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

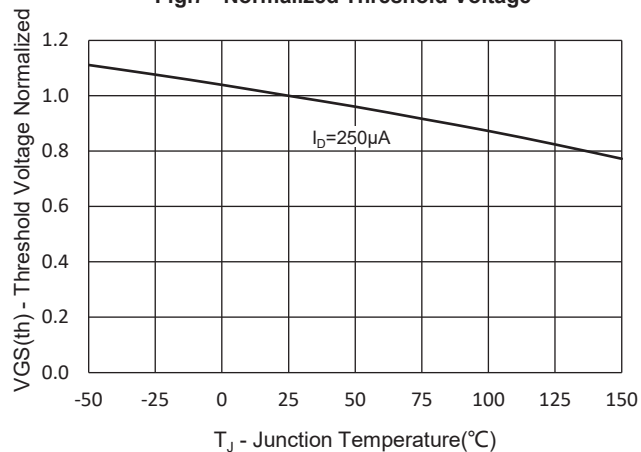


Fig.8 - Normalized On Resistance Characteristics

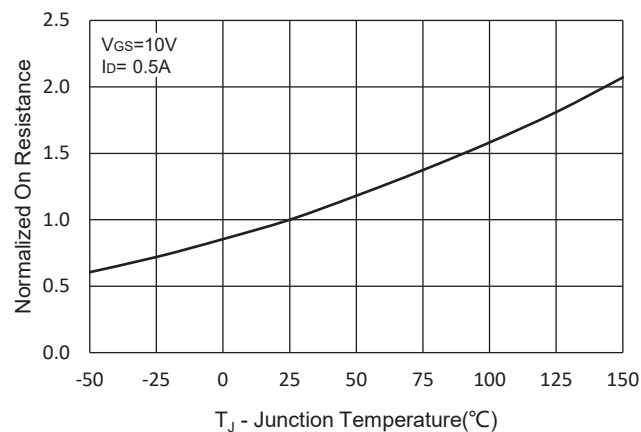


Fig.9 - $I_S - V_{SD}$

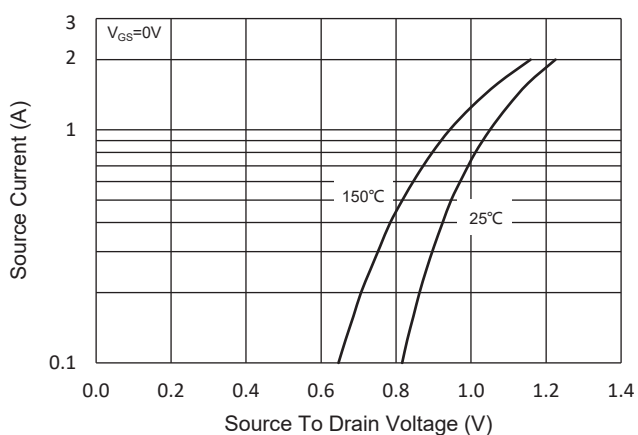


Fig. 10 - Drain Current

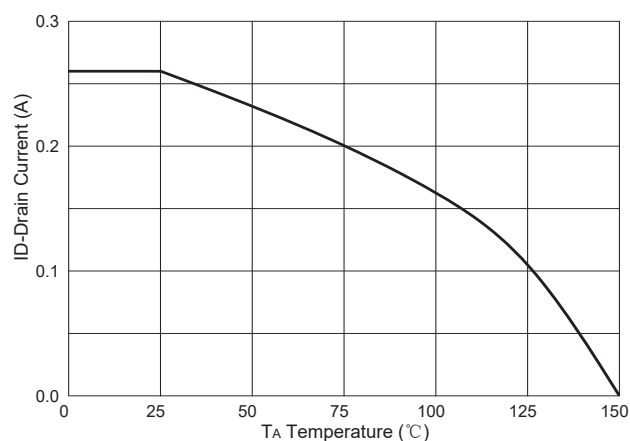
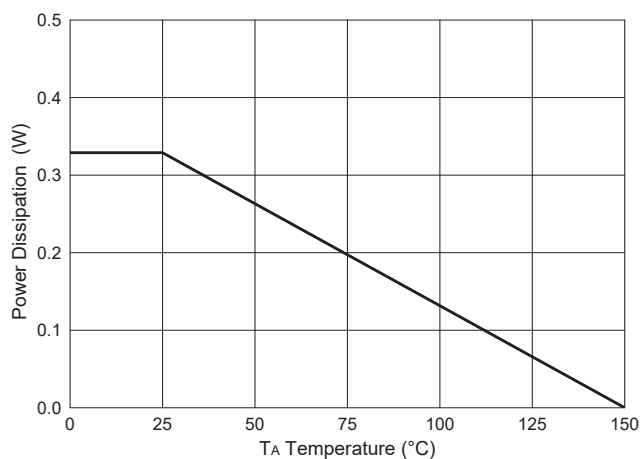


Fig.11-PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

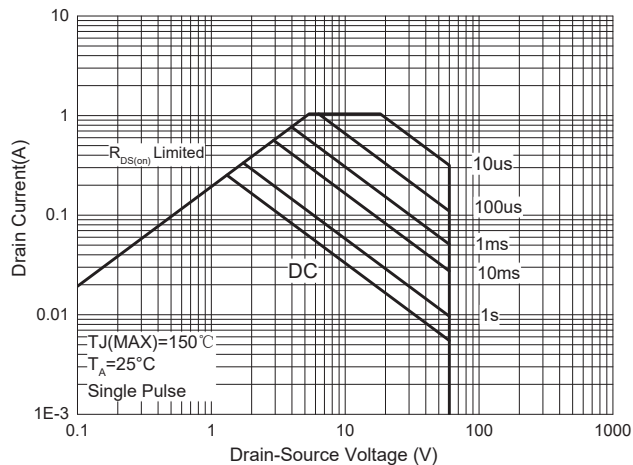
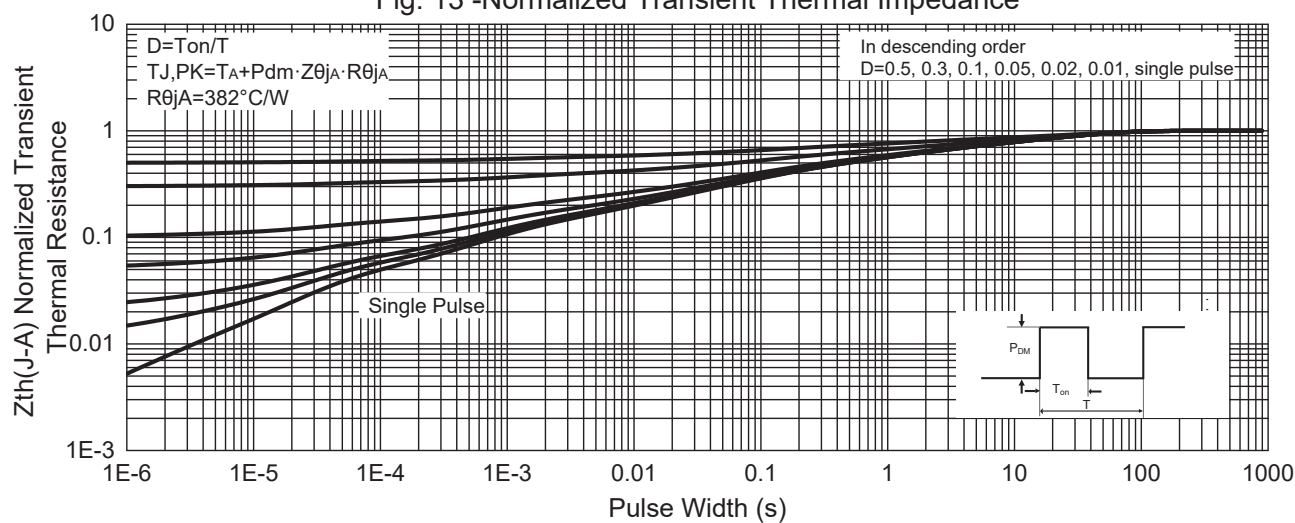


Fig. 13 - Normalized Transient Thermal Impedance



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 10Kpcs/Reel
Part Number-TPQ3	Tape&Reel: 10Kpcs/Reel

For packaging details, go to our website at <https://www.mccsemi.com/pdf/productpackaging/DFN1006-3%20Package.pdf>

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