

Features

- High Density Cell Design for Low $R_{DS(ON)}$
- ESD HBM Class 2
- Moisture Sensitivity Level 1
- 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

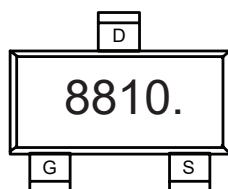
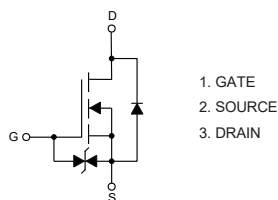
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 96°C/W Junction to Ambient (Note 2)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current	I_D	7	A
		4.4	
		$T_A=25^\circ\text{C}$	
		$T_A=100^\circ\text{C}$	
Pulsed Drain Current (Note 3)	I_{DM}	28	A
Total Power Dissipation (Note 4)	P_D	1.3	W

Note:

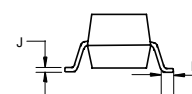
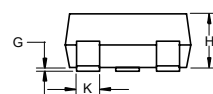
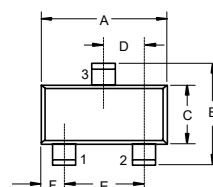
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$.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



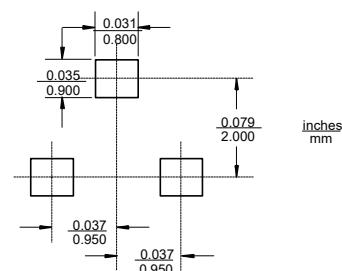
N-Channel MOSFET

SOT-23



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.110	0.120	2.80	3.04	
B	0.083	0.104	2.10	2.64	
C	0.047	0.055	1.20	1.40	
D	0.034	0.041	0.85	1.05	
E	0.067	0.083	1.70	2.10	
F	0.018	0.024	0.45	0.60	
G	0.0004	0.006	0.01	0.15	
H	0.035	0.043	0.90	1.10	
J	0.003	0.007	0.08	0.18	
K	0.012	0.020	0.30	0.51	
L	0.007	0.020	0.20	0.50	

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	20			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±10V			±10	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V, V _{GS} =0V			1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.4	0.7	0.9	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =7A		13	18	mΩ
		V _{GS} =4.5V, I _D =6.6A		14	22	
		V _{GS} =3.8V, I _D =6A		14	24	
		V _{GS} =2.5V, I _D =5.5A		17	26	
		V _{GS} =1.8V, I _D =5A		25	39	
Gate Resistance	R _g	f=1 MHz, Open drain		24		Ω
Forward Tranconductance	gfs	V _{DS} =5V, I _D =7A		30		S
Diode Characteristics						
Continuous Body Diode Current	I _S				7	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =1A			1	V
Reverse Recovery Time	t _{rr}	I _F =7A, di/dt=100A/μs		16		ns
Reverse Recovery Charge	Q _{rr}			4.2		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHz		716		pF
Output Capacitance	C _{oss}			130		
Reverse Transfer Capacitance	C _{rss}			113		
Total Gate Charge	Q _g	V _{DS} =10V, V _{GS} =4.5V, I _D =7A		8.6		nC
Gate-Source Charge	Q _{gs}			1.3		
Gate-Drain Charge	Q _{gd}			2.3		
Turn-On Delay Time	t _{d(on)}	V _{DS} =10V, V _{GS} =5V, R _G =3Ω, I _D =7A		6.5		ns
Turn-On Rise Time	t _r			6		
Turn-Off Delay Time	t _{d(off)}			21		
Turn-Off Fall Time	t _f			6.5		

Curve Characteristics

Fig. 1 - Typical Output Characteristics

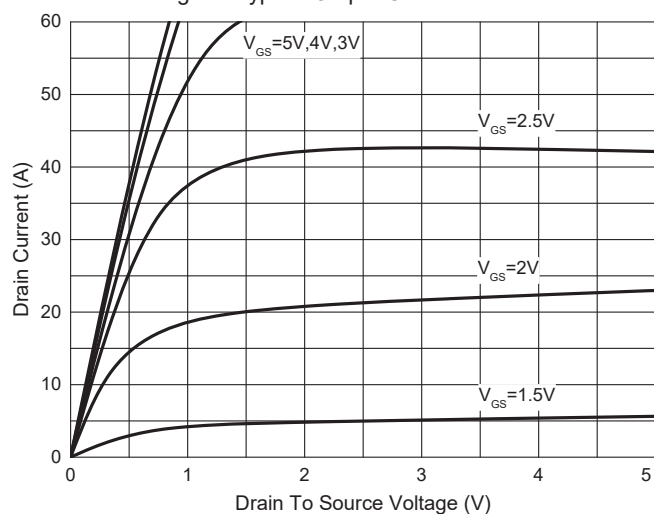


Fig. 2 - Transfer Characteristics

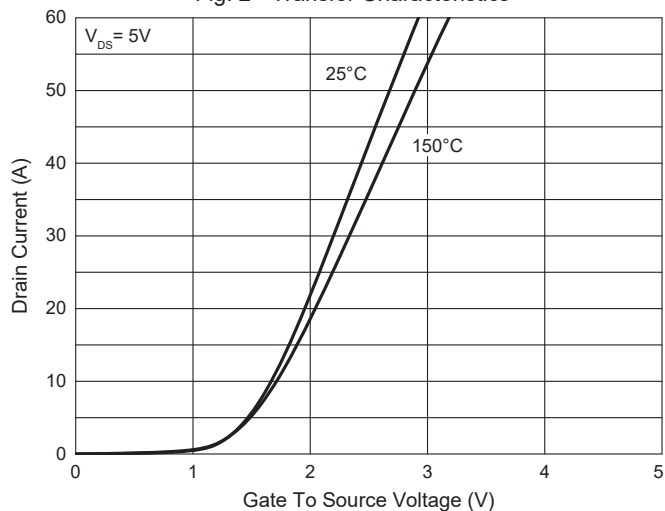


Fig.3- $R_{DS(ON)}-V_{GS}$

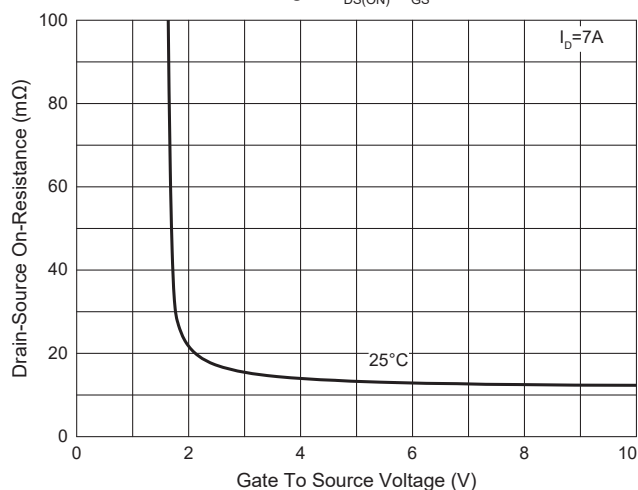


Fig.4- $R_{DS(ON)}-I_D$

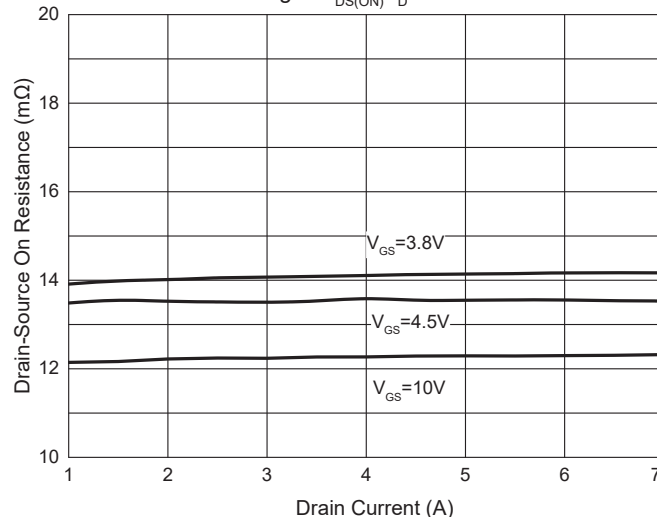


Fig. 5 - Capacitance Characteristics

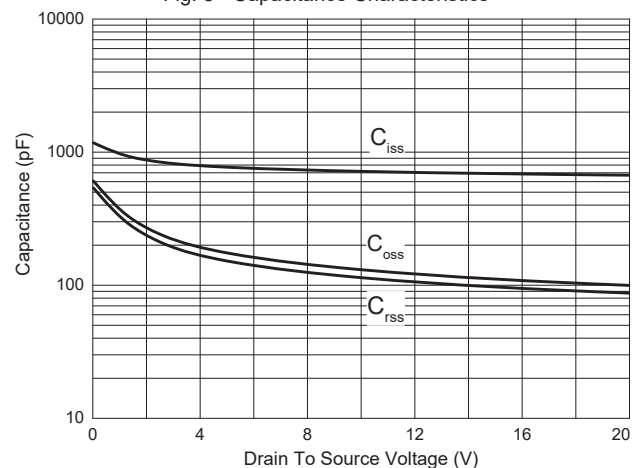
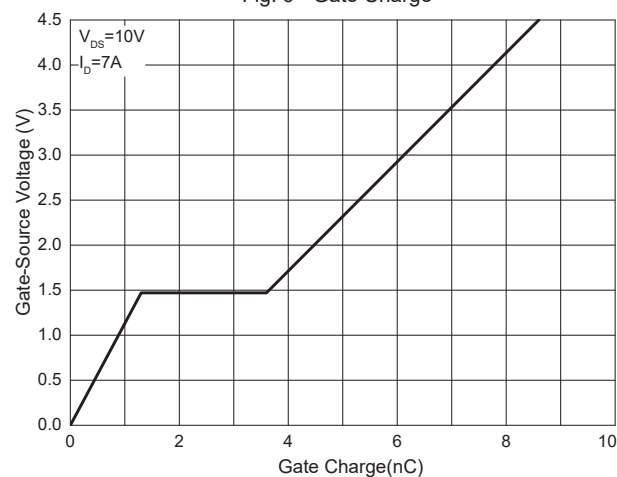


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - Normalized Threshold Voltage

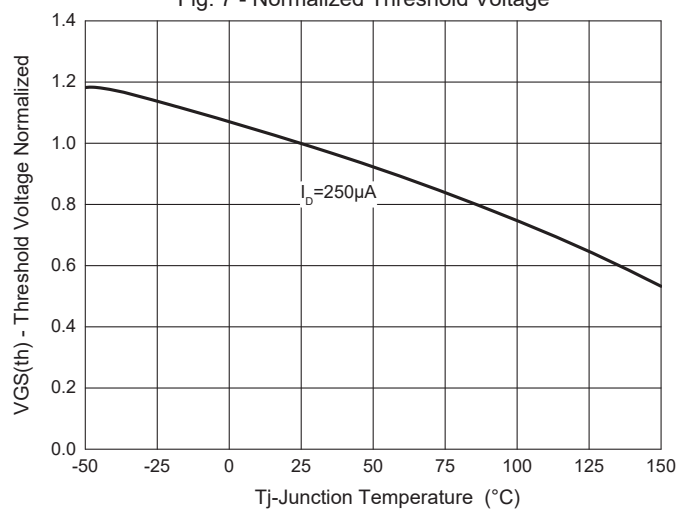


Fig. 8 - Normalized On Resistance Characteristics

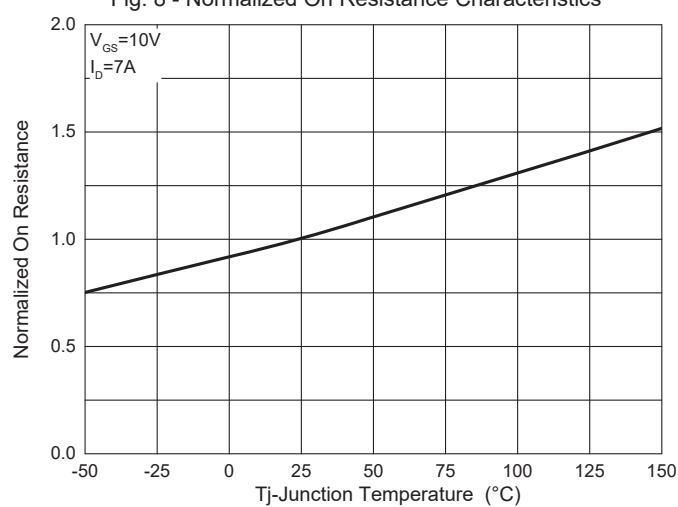


Fig. 9 - $I_S - V_{SD}$

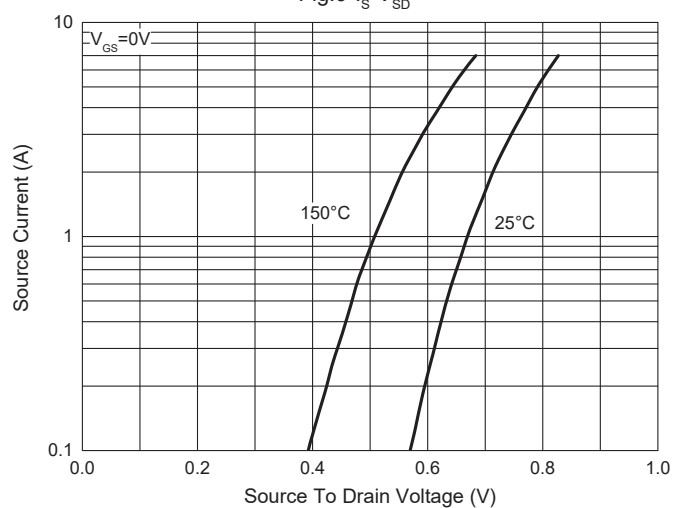


Fig. 10 - Drain Current

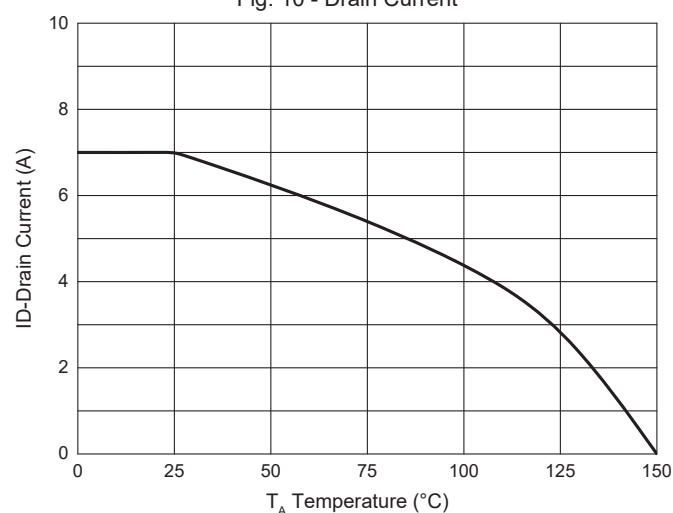
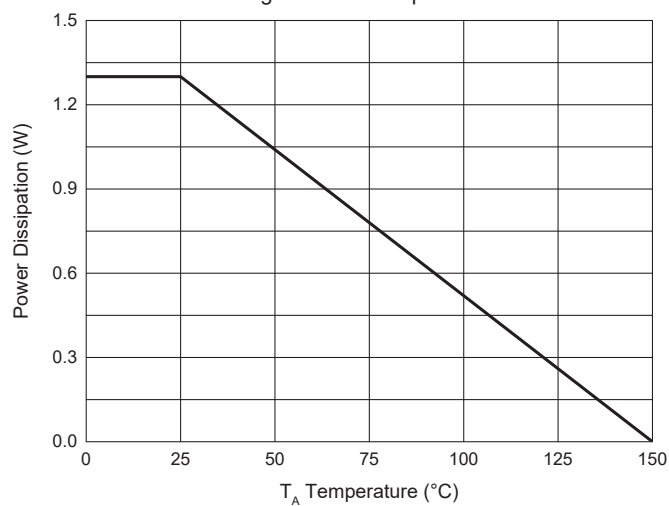


Fig. 11 - PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

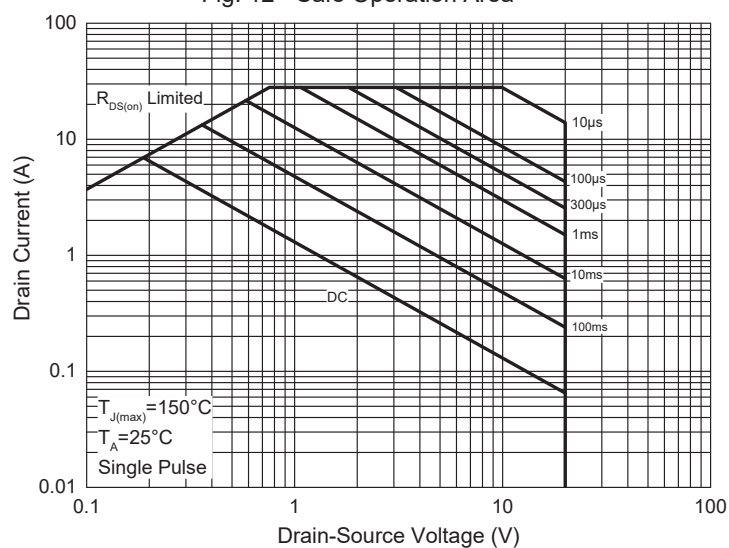
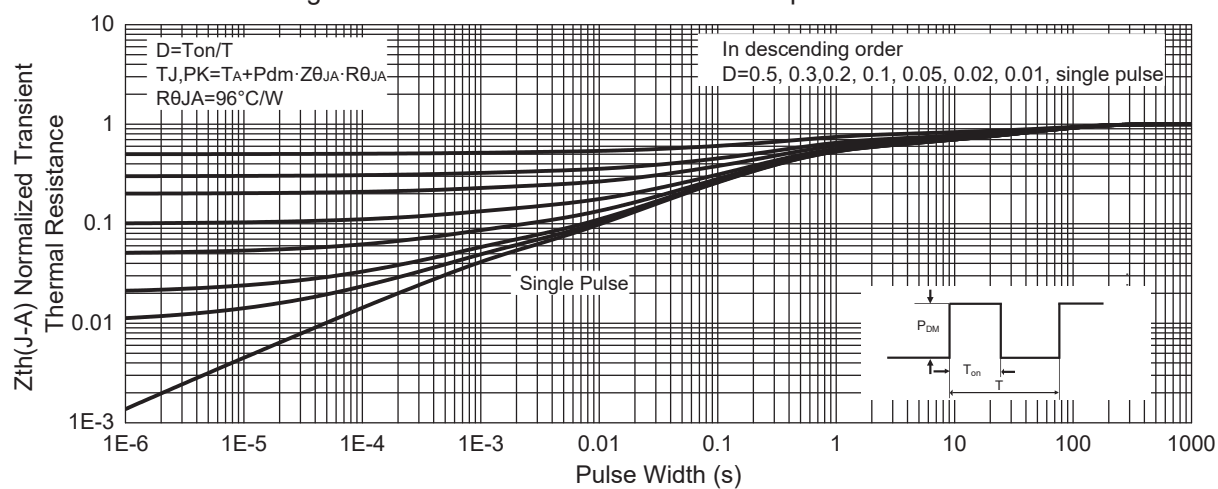


Fig. 13 - Normalized Transient Thermal Impedance



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel:3Kpcs/Reel

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