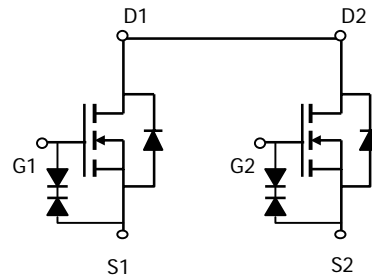
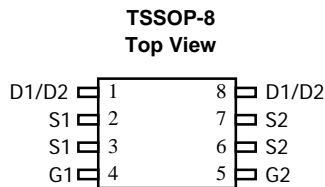


## Common-Drain Dual N-Channel Enhancement Mode Field Effect Transistor

General Description	Features
<p>The 8810 uses advanced trench technology to provide excellent <math>R_{DS(ON)}</math>, low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch or in PWM applications. It is ESD protected.</p> <p><i>Standard Product 8810 is Pb-free (meets ROHS &amp; Sony 259 specifications). 8810 is electrically identical.</i></p>	<p><math>V_{DS} (V) = 20V</math>  <math>I_D = 6A (V_{GS} = 4.5V)</math>  <math>R_{DS(ON)} &lt; 22m\Omega (V_{GS} = 4.5V)</math>  <math>R_{DS(ON)} &lt; 30m\Omega (V_{GS} = 2.5V)</math>            ESD Rating: 2000V HBM</p>



### Absolute Maximum Ratings $T_A=25^\circ C$ unless otherwise noted

Parameter	Symbol	Maximum	Units	
Drain-Source Voltage	$V_{DS}$	20	V	
Gate-Source Voltage	$V_{GS}$	$\pm 8$	V	
Continuous Drain Current <sup>A</sup>	$T_A=25^\circ C$	$I_D$	A	
Pulsed Drain Current <sup>B</sup>				$I_{DM}$
Power Dissipation <sup>A</sup>	$T_A=25^\circ C$	$P_D$	1.5	W
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ C$	

### Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup>	$R_{\theta JA}$	64	83	$^\circ C/W$
Maximum Junction-to-Ambient <sup>A</sup>				
Maximum Junction-to-Lead <sup>C</sup>	$R_{\theta JL}$	53	70	$^\circ C/W$



Electrical Characteristics (T =25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$I_D=250\mu A, V_{GS}=0V$	20			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=16V, V_{GS}=0V$			1	$\mu A$
$I_{GSS}$	Gate-Body leakage current	$V_{DS}=0V, V_{GS}=\pm 12V$			$\pm 15$	$\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.6	1	V
$I_{D(ON)}$	On state drain current	$V_{GS}=4.5V, V_{DS}=5V$	30			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=4.5V, I_D=6A$		20	22	$m\Omega$
		$V_{GS}=2.5V, I_D=5.5A$		28	30	$m\Omega$
$g_{FS}$	Forward Transconductance	$V_{DS}=5V, I_D=6A$		29		S
$V_{SD}$	Diode Forward Voltage	$I_S=1.5A, V_{GS}=0V$			1.2	V
$I_S$	Maximum Body-Diode Continuous Current				2.5	A
<b>DYNAMIC PARAMETERS</b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=10V, f=1MHz$		1160		pF
$C_{oss}$	Output Capacitance			187		pF
$C_{rss}$	Reverse Transfer Capacitance			146		pF
$R_g$	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1MHz$		1.5		$\Omega$
<b>SWITCHING PARAMETERS</b>						
$Q_g$	Total Gate Charge	$V_{GS}=4.5V, V_{DS}=10V, I_D=7A$		16		nC
$Q_{gs}$	Gate Source Charge			0.8		nC
$Q_{gd}$	Gate Drain Charge			3.8		nC
$t_{D(on)}$	Turn-On DelayTime	$V_{GS}=5V, V_{DS}=10V, R_L=1.35\Omega, R_{GEN}=3\Omega$		6.2		ns
$t_r$	Turn-On Rise Time			12.7		ns
$t_{D(off)}$	Turn-Off DelayTime			51.7		ns
$t_f$	Turn-Off Fall Time			16		ns
$t_{rr}$	Body Diode Reverse Recovery Time	$I_F=7A, dI/dt=100A/\mu s$		17.7		ns
$Q_{rr}$	Body Diode Reverse Recovery Charge	$I_F=7A, dI/dt=100A/\mu s$		6.7		nC

A: The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ C$ . The value in any given application depends on the user's specific board design. The current rating is based on the  $t \leq 10s$  thermal resistance rating.

B: Repetitive rating, pulse width limited by junction temperature.

C. The  $R_{\theta JA}$  is the sum of the thermal impedance from junction to lead  $R_{\theta JL}$  and lead to ambient.

D. The static characteristics in Figures 1 to 6,12,14 are obtained using 80 $\mu s$  pulses, duty cycle 0.5% max.

E. These tests are performed with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ C$ . The SOA curve provides a single pulse rating.



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

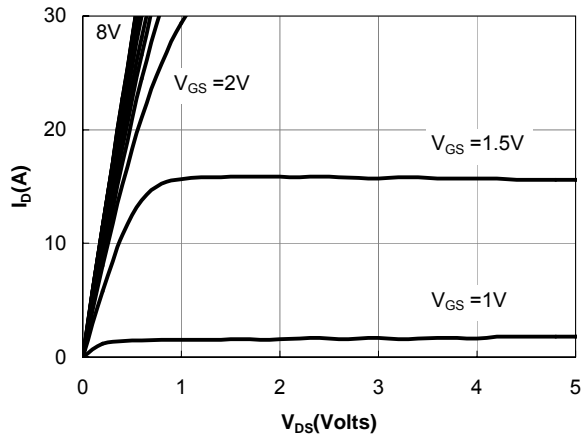


Figure 1: On-Regions Characteristic CS

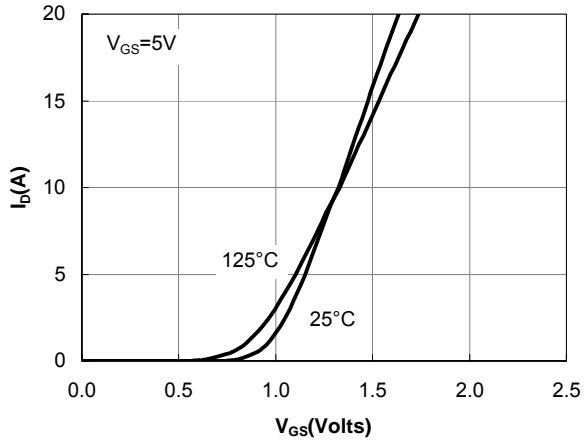


Figure 2: Transfer Characteristics

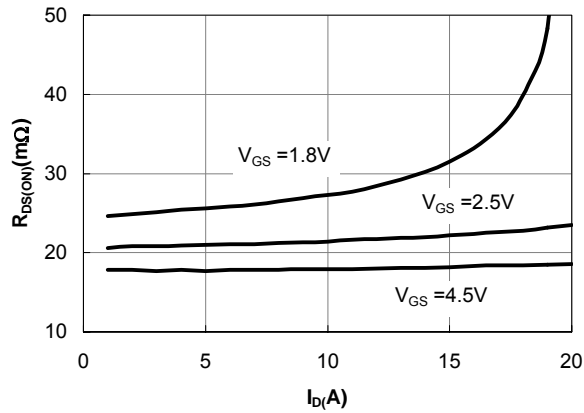


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

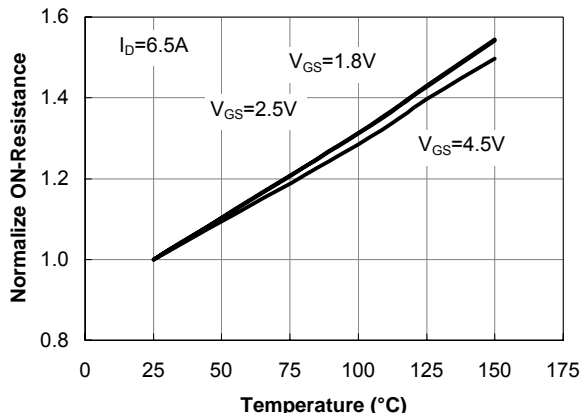


Figure 4: On-Resistance vs. Junction Temperature

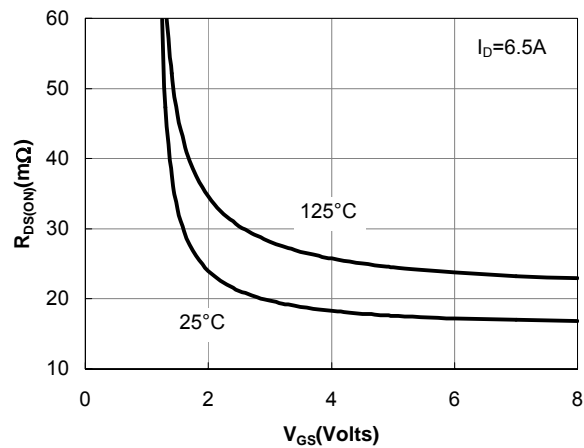


Figure 5: On-Resistance vs. Gate-Source Voltage

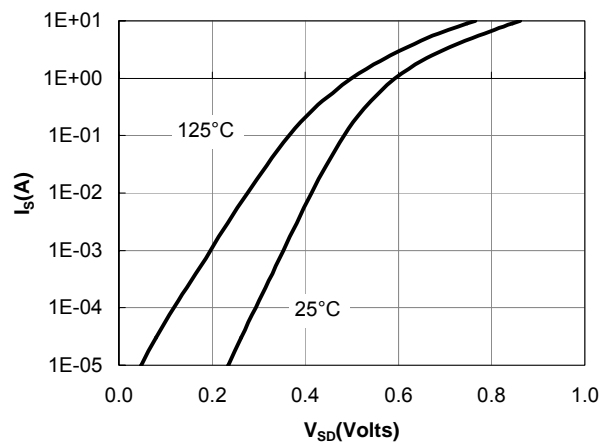


Figure 6: Body-Diode Characteristics

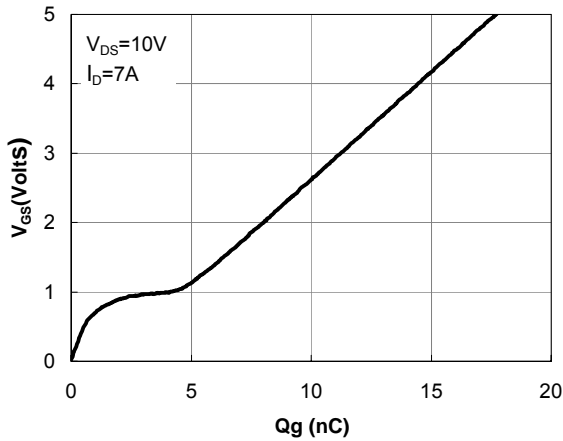


Figure 7: Gate-Charge Characteristics

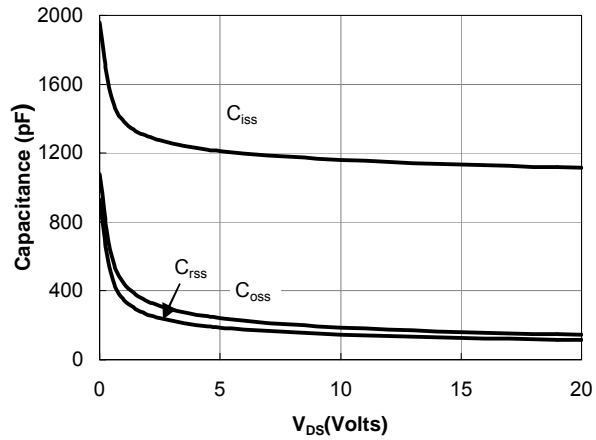


Figure 8: Capacitance Characteristics

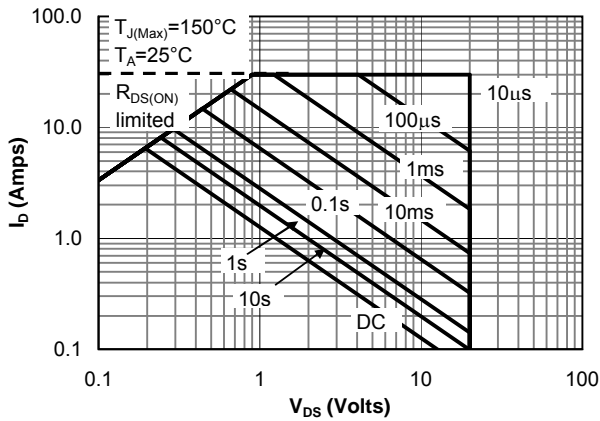


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

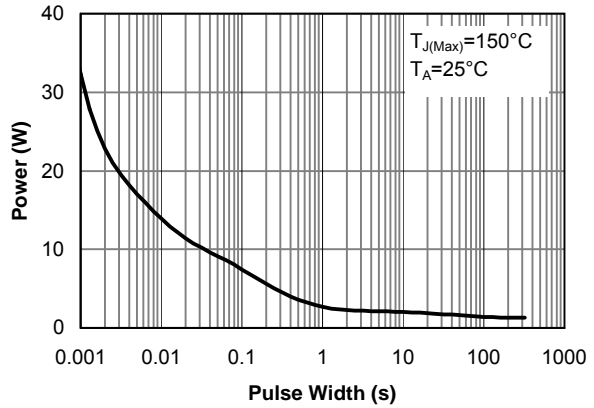


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

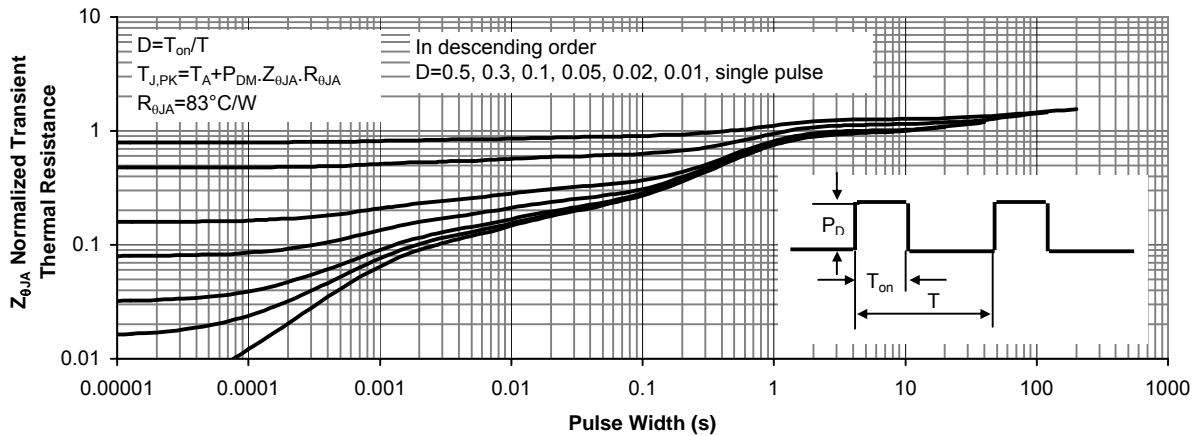


Figure 11: Normalized Maximum Transient Thermal Impedance