



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

- **Features**

$V_{DS} (V) = 30V$

$I_D = 7.5A$

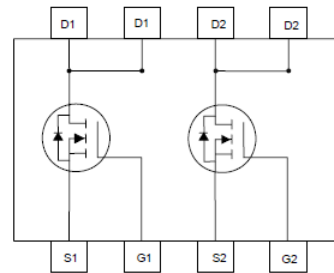
$R_{DS(ON)} \leq 25m\Omega (V_{GS} = 10V)$

$R_{DS(ON)} \leq 40m\Omega (V_{GS} = 4.5V)$

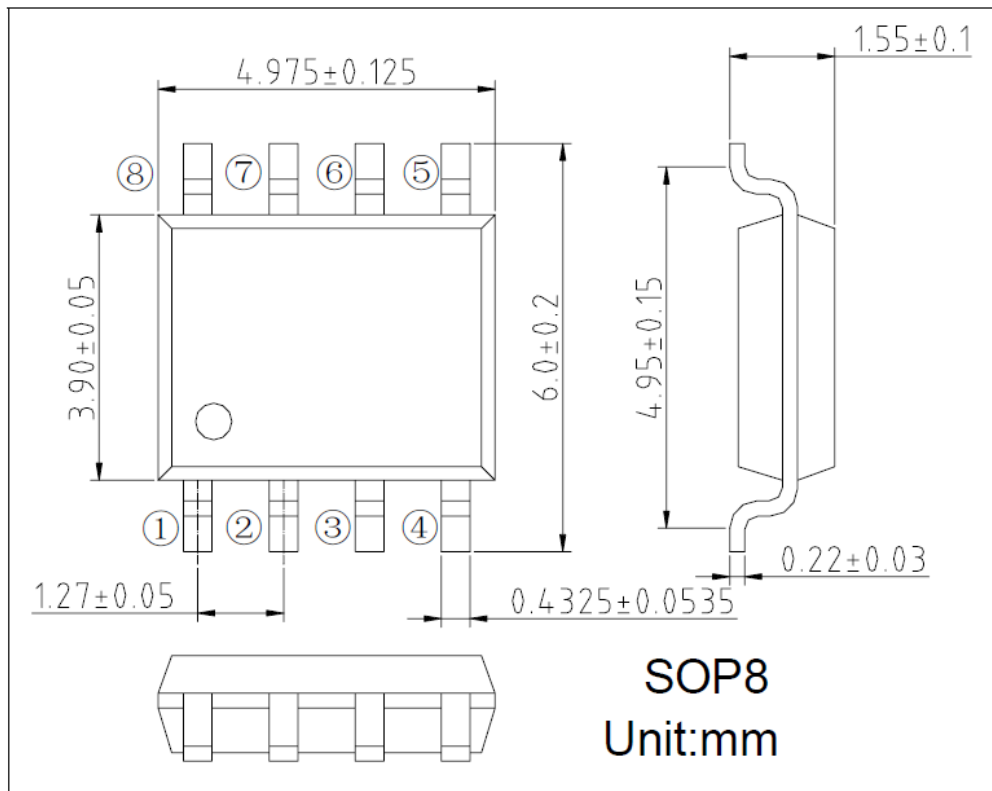
- **General Description**

The HX4812 uses advanced trench technology to provide excellent  $R_{DS(ON)}$  with low gate charge. It can be used in a wide variety of applications.

- **Pin Configurations**



- **Package Information**





● **Absolute Maximum Ratings** @ $T_A=25^\circ\text{C}$  unless otherwise noted

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		$V_{DSS}$	30	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current (Continuous) *AC	$T_A=25^\circ\text{C}$	$I_D$	7.5	A
	$T_A=70^\circ\text{C}$		6.2	
Drain Current (Pulse) *B		$I_{DM}$	62	A
Power Dissipation	$T_A=25^\circ\text{C}$	$P_D$	2	W
	$T_A=70^\circ\text{C}$		1.44	
Operating Temperature/ Storage Temperature		$T_J/T_{STG}$	-55~150	$^\circ\text{C}$
Thermal Resistance ,Junction-to-Ambient		$R_{\theta JA}$	85	$^\circ\text{C/W}$

● **Electrical Characteristics** @ $T_A=25^\circ\text{C}$  unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250 \mu A$	30	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 24 V, V_{GS} = 0V$	--	--	1	$\mu A$
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_{DS} = 250 \mu A$	1	1.5	2.5	V
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	--	--	$\pm 100$	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 6A$	--	17	25	$m\Omega$
		$V_{GS} = 4.5V, I_D = 5A$	--	30	40	$m\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS} = 5V, I_D=7A$	10	--	--	S
Diode Forward Voltage	$V_{SD}$	$I_{SD}=1A, V_{GS}=0V$	--	--	1.2	V
<b>Switching</b>						
Total Gate Charge	$Q_g$	$V_{GS}=10V, V_{DS}=15V,$ $I_D=7.7A$	--	7.2	--	nC
Gate-Source Charge	$Q_{gs}$		--	1.3	--	nC
Gate-Drain Charge	$Q_{gd}$		--	1.7	--	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DD}=15V,$ $R_L=2\Omega, R_{GEN}=3\Omega$	--	5	--	ns
Turn-on Rise Time	$t_r$		--	3	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	15	--	ns
Turn-off Fall Time	$t_f$		--	3	--	ns
<b>Dynamic</b>						
Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=15V,$ $f=1MHz$	--	380	--	pF
Output Capacitance	$C_{oss}$		--	67	--	pF
Reverse Transfer Capacitance	$C_{rss}$		--	41	--	pF

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  $T_A=25^\circ\text{C}$ . The value in any given application depends on the user's specific board design.

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

C: The current rating is based on the  $t \leq 10s$  junction to ambient thermal resistance rating.



● TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

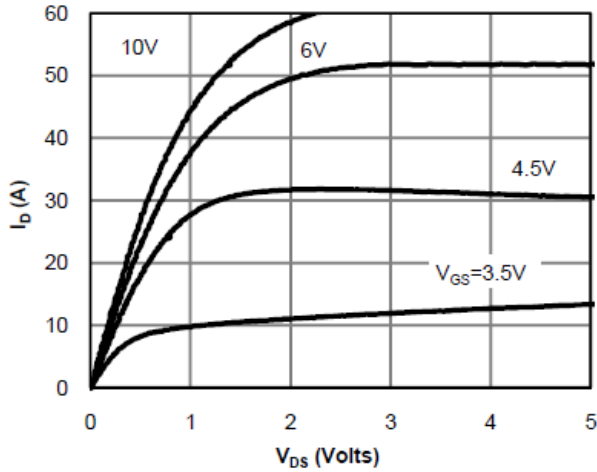


Fig 1: On-Region Characteristics

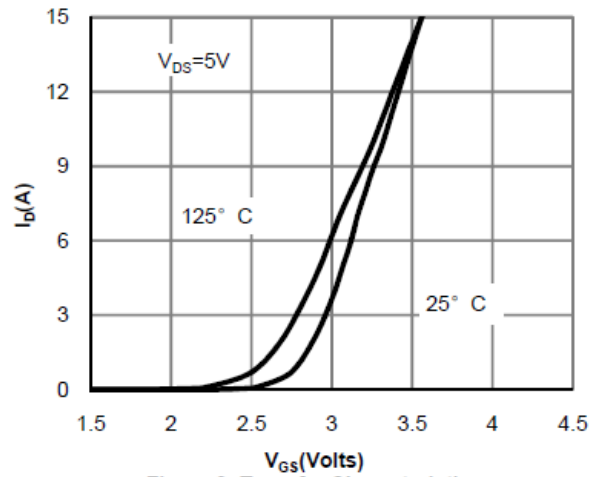


Figure 2: Transfer Characteristics

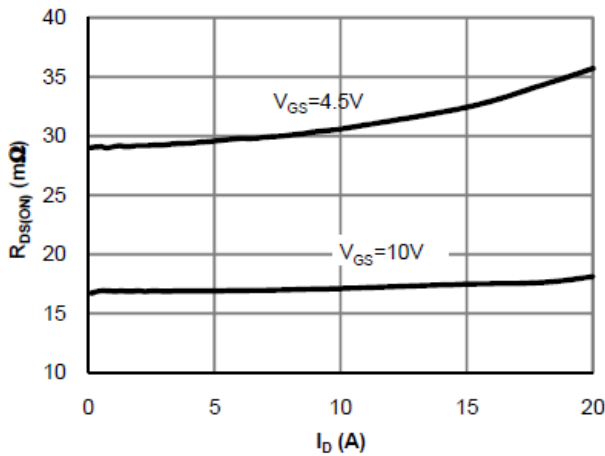


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

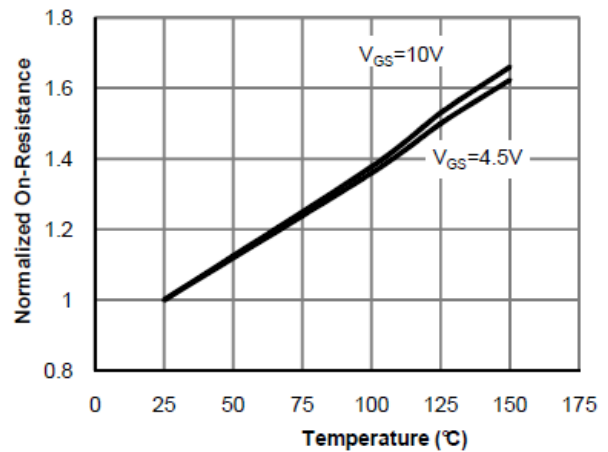


Figure 4: On-Resistance vs. Junction Temperature

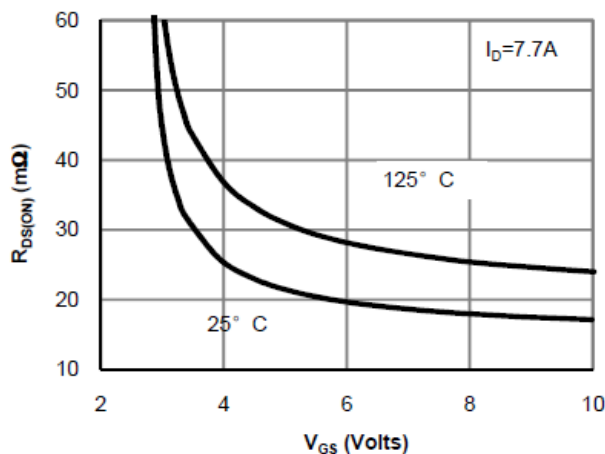


Figure 5: On-Resistance vs. Gate-Source Voltage

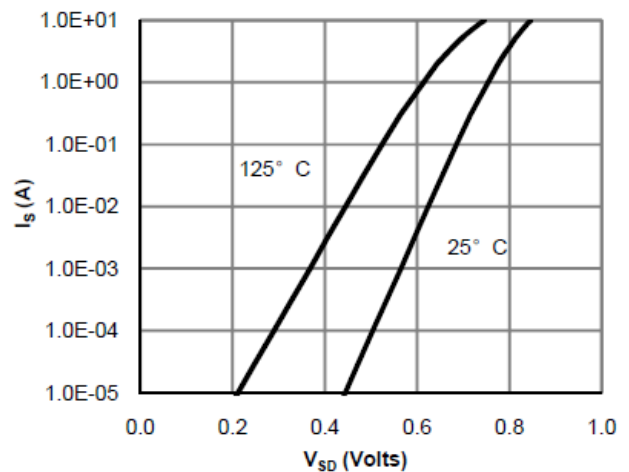


Figure 6: Body-Diode Characteristics

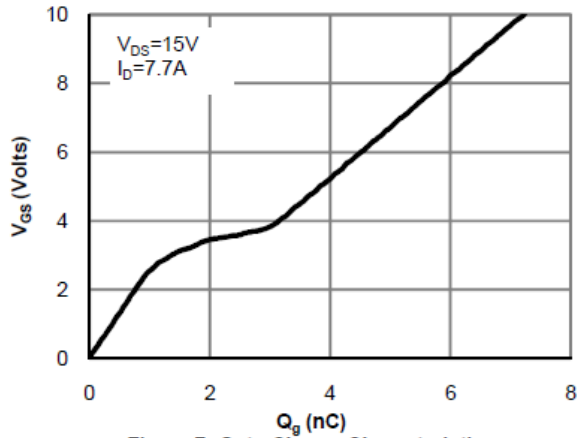


Figure 7: Gate-Charge Characteristics

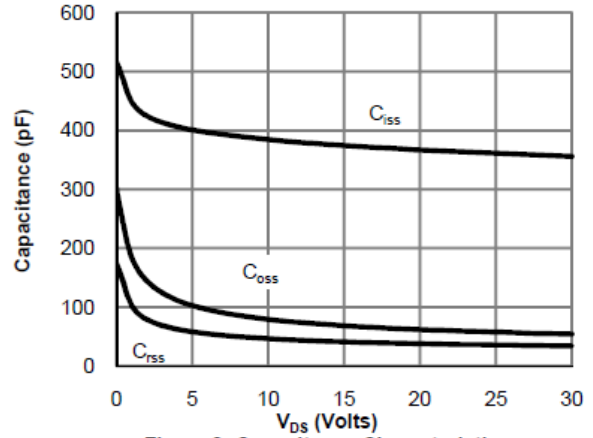


Figure 8: Capacitance Characteristics

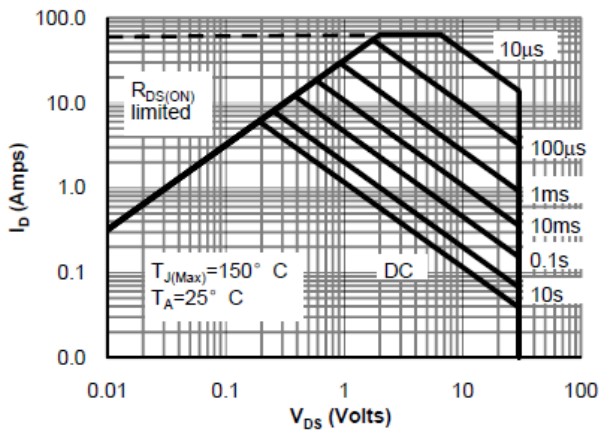


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

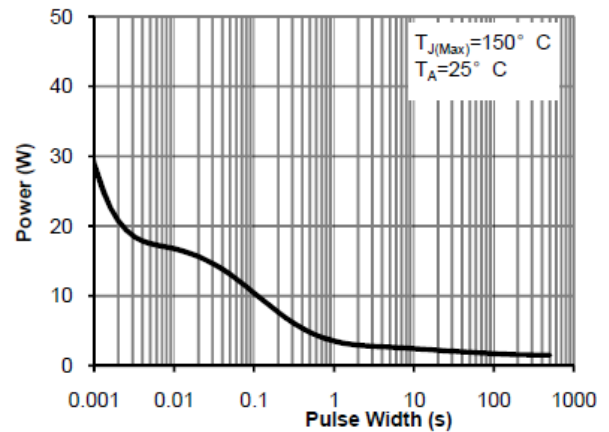


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

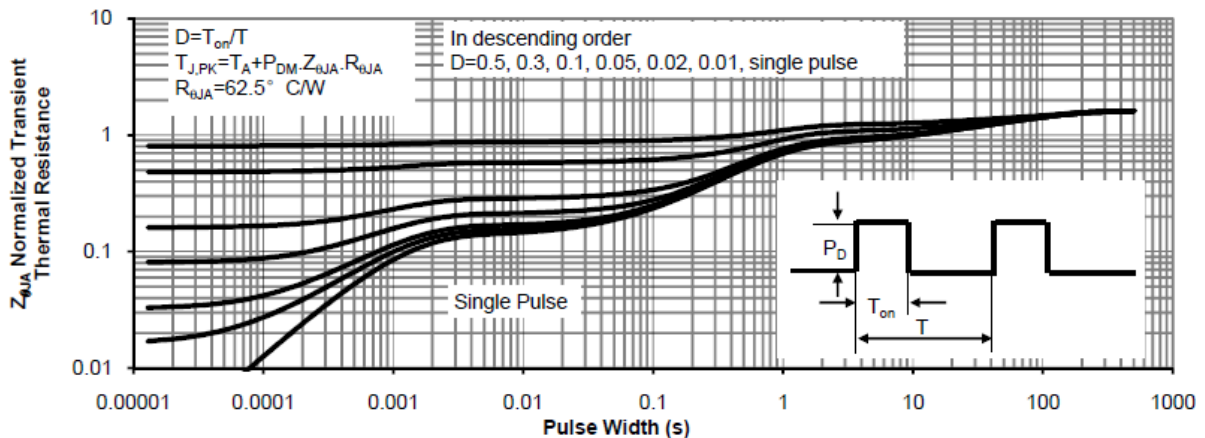


Figure 11: Normalized Maximum Transient Thermal Impedance



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