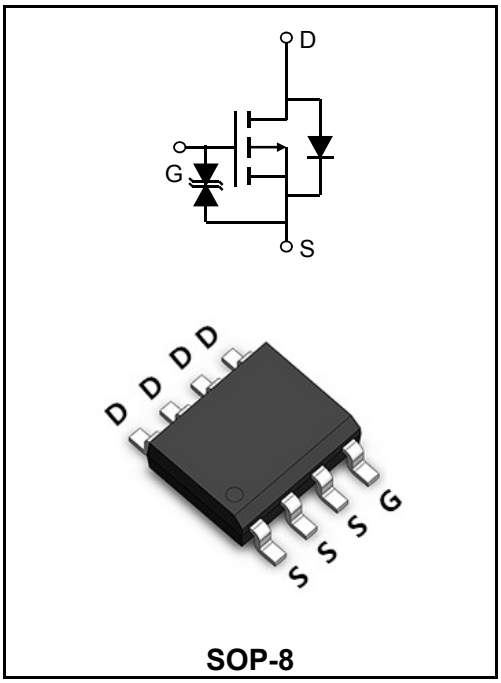
-30V P-Channel MOSFET

MAIN CHARACTERISTICS

I_D	-17A
V_{DSS}	-30V
R_{DSON}-typ(@V_{GS}=-20V)	<6.2mΩ(Typ:5.1mΩ)
R_{DSON}-typ(@V_{GS}=-10V)	<7.2mΩ(Typ:5.9mΩ)



SOP-8

General Description

The YFW4423S uses advanced trench technology to provide excellent $R_{DS(ON)}$, and ultra-low low gate charge with a 25V gate rating. This device is suitable for use as a load switch or in PWM applications.

Product Summary

- ESD Protected
- 100% UIS tested
- 100% Rg tested (note *)

Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

Characteristics		Symbols	Value	Units
Drain-Source Voltage		V_{DS}	-30	V
Gate - Source Voltage		V_{GS}	±25	V
Drain Current – Continuous [AF]	T_A=25°C	I_D	-17	A
	T_A=70°C		-14	
Pulsed Drain Current [B]		I_{DM}	-182	A
Maximum Power Dissipation [A]	T_A=25°C	P_D	3.1	W
	T_A=70°C		2.0	
Storage Temperature Range		T_{STG}	-55 to +150	°C
Operating Junction Temperature Range		$T_{J,}$	-55 to +150	°C
Thermal Resistance,Junction-to-Ambient [AF]	t ≤ 10s	$R_{\theta JA}$	26	°C/W
Thermal Resistance,Junction-to-Ambient [A]	Steady-State	$R_{\theta JA}$	50	°C/W
Maximum Junction-to-Lead [C]	Steady-State	$R_{\theta JL}$	14	°C/W

Electrical Characteristics (T_J=25℃unless otherwise noted)

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	BV_{DSS}	-30		-	V
Drain -Source Leakage Current	V_{DS}=-30V , V_{GS}=0V	I_{DSS}	-	-	-1	μA
	V_{DS}=-30V , V_{GS}=0V T_J=55°C		-	-	-5	μA
Gate-Source Leakage Current	V_{DS}=0V, V_{GS}=±20V	I_{GSS}	-	-	±1	μA
	V_{DS}=0V,V_{GS}=±25V		-	-	±10	μA
Gate Threshold Voltage	V_{DS}=V_{GS} I_D=-250μA	$V_{GS(th)}$	-1.5	-2.1	-2.6	V
On state drain current	V_{GS}=-10V, V_{DS}=-5V	$I_{D(ON)}$	-182	-	-	A
Static Drain-Source On-Resistance	V_{GS} = -20 V, I_D =-15A	$R_{DS(ON)}$	-	5.1	6.2	mΩ
	V_{GS} =-20 V,I_D=-15A T_J=125°C		-	7.4	9	mΩ
	V_{GS}=-10V, I_D=-15A		-	5.9	7.2	mΩ
	V_{GS}=-6V, I_D=-10A		-	7.5	9.5	mΩ
Forward Transconductance	V_{DS}=-5V , I_D=-15A	g_{FS}	-	48	-	S
Input Capacitance	V_{DS}=-15V V_{GS}=0V F=1.0MHz	C_{iss}	-	2527	3033	pF
Output Capacitance		C_{oss}	-	583	-	
Reverse Transfer Capacitance		C_{rss}	-	397	556	
Turn-on Delay Time	V_{GS}=-10V V_{DS}=-15V R_L=1.0Ω R_{GEN}=3Ω	$t_{d(on)}$	-	12	-	ns
Turn-on Rise Time		T_r	-	8	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	54	-	
Turn-Off Fall Time		t_f	-	87	-	
Total Gate Charge	V_{DS}=-15V, I_D=-15A V_{GS}=-10V	Q_G	-	47	57	nC
Gate to Source Charge		Q_{GS}	-	8	-	
Gate to Drain Charge		Q_{GD}	-	14	-	
Body Diode Reverse Recovery Time	I_F=-15A, dI/dt=100A/μs	t_{rr}	-	26.1	32	ns
Body Diode Reverse Recovery Charge	I_F=-15A, dI/dt=100A/μs	Q_{rr}	-	12.3	-	nC
Diode Forward Voltage	I_S=-1A,V_{GS}=0V	V_{SD}	-	-0.71	-1	V
Maximum Body-Diode Continuous Current		I_S	-	-	-4.2	A
Gate resistance	V_{GS}=0V, VDS=0V, f=1MHz	Rg	2.1	4.3	6.4	Ω

A: The value of R θJA is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with T A=25°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 R θJA is the sum of the thermal impedence from junction to lead R θJL and lead to ambient.
D. The static characteristics in Figures 1 to 6 are obtained using <300 μs pulses, duty cycle 0.5% max.
E. These tests are performed with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T A=25°C. The SOA curve provides a single pulse rating.
F. The current rating is based on the t≤ 10s junction to ambient thermal resistance rating.
Note *: This device is guaranteed RG 100% tested after date code 8V11 (Jan 1st 2008)

Typical Electrical and Thermal Characteristics

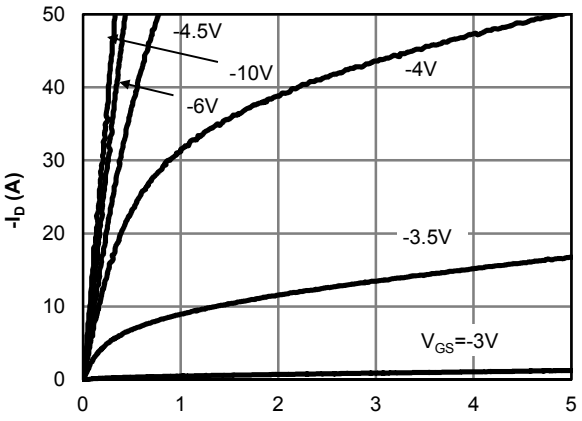


Fig 1: On-Region Characteristics

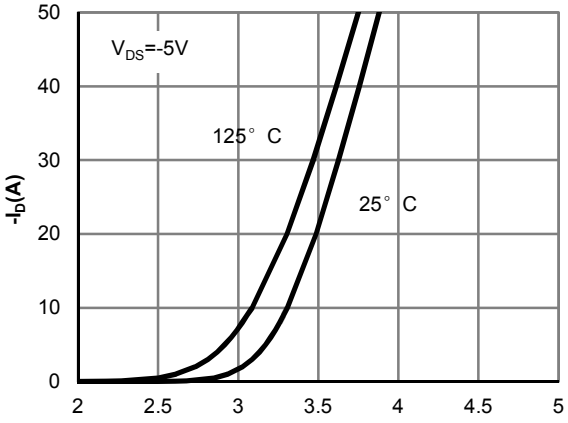


Figure 2: Transfer Characteristics

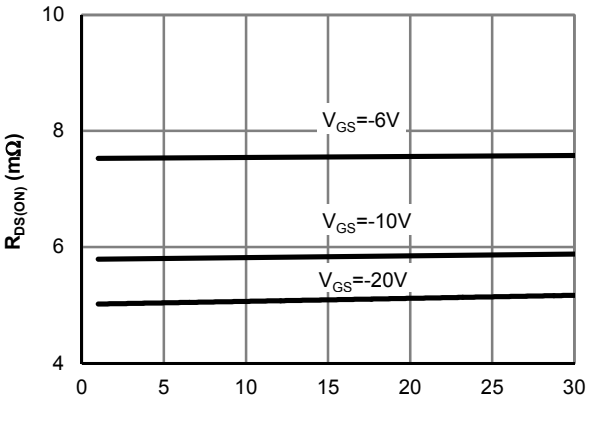


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

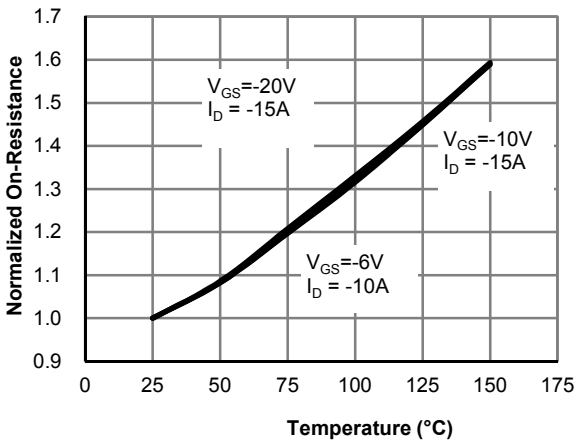


Figure 4: On-Resistance vs. Junction Temperature

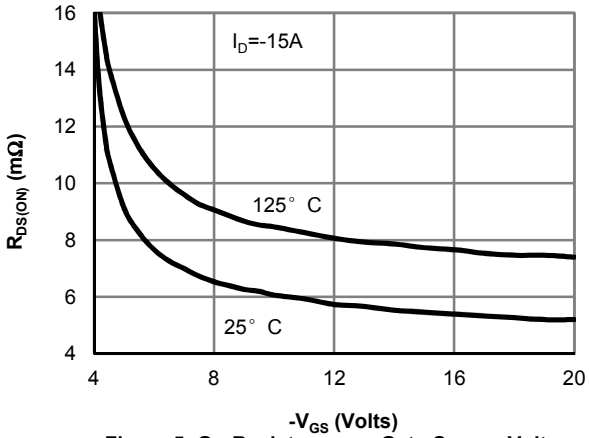


Figure 5: On-Resistance vs. Gate-Source Voltage

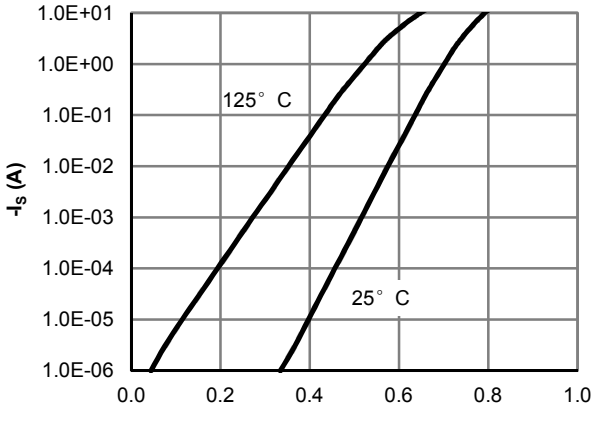


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

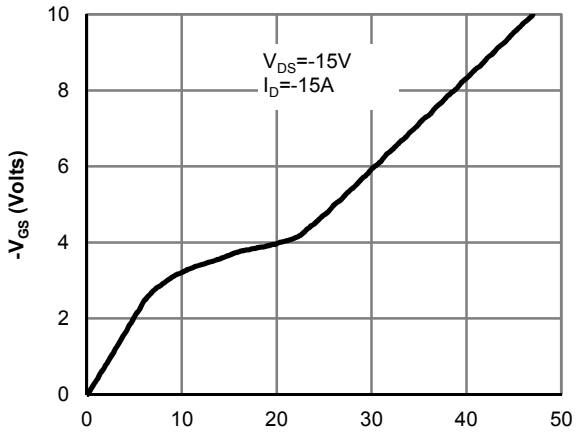


Figure 7: Gate-Charge Characteristics

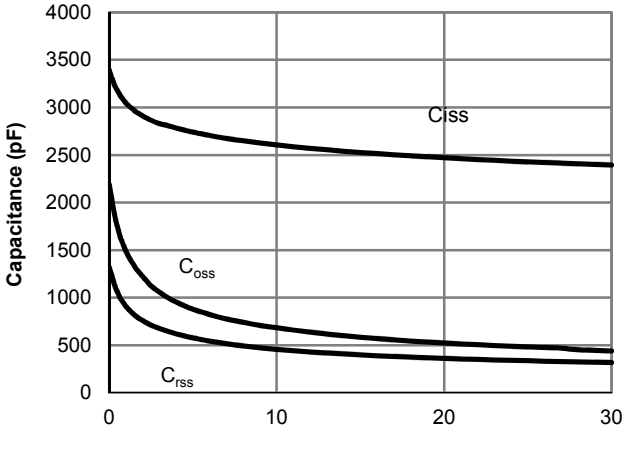


Figure 8: Capacitance Characteristics

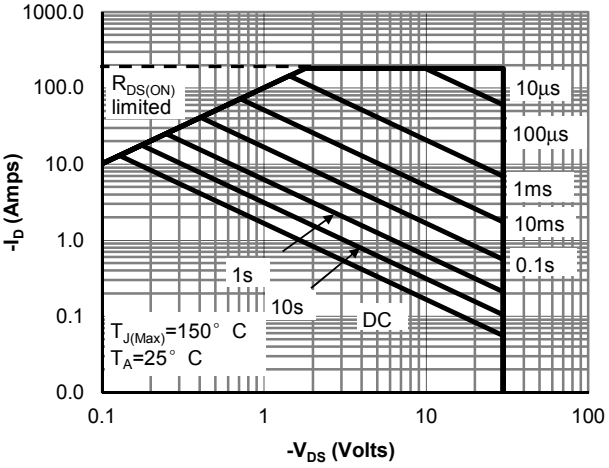


Figure 9: Maximum Forward Biased Safe

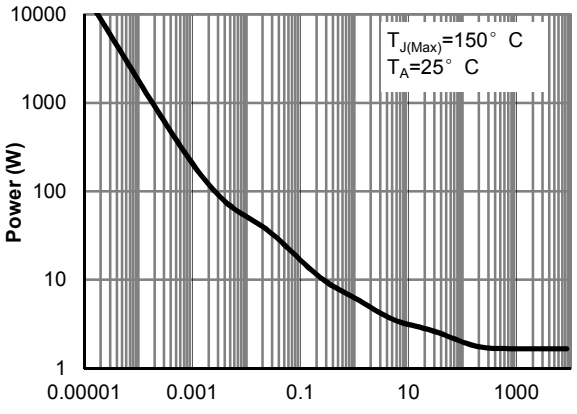


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

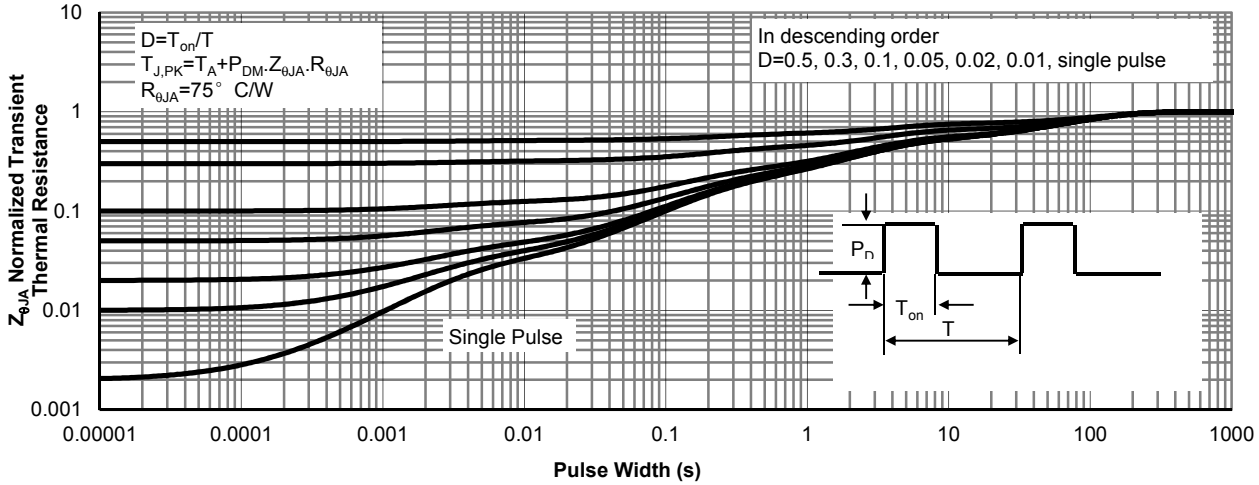
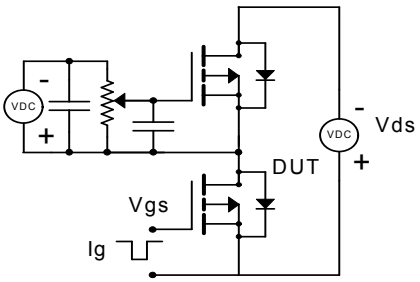
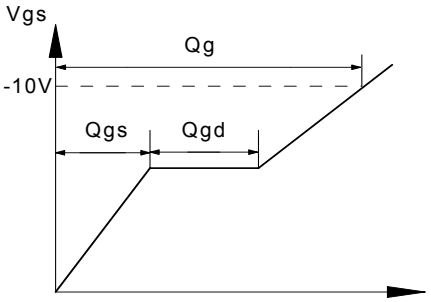


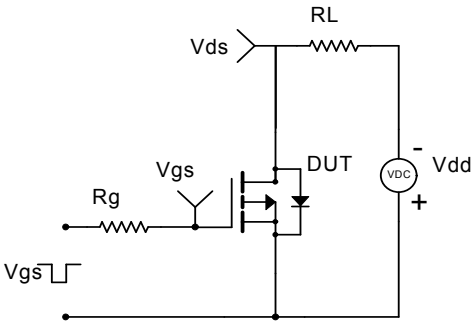
Figure 11: Normalized Maximum Transient Thermal Impedance

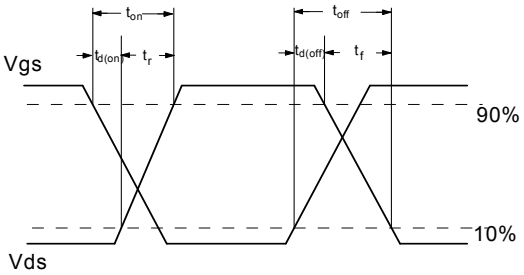
Gate Charge Test Circuit & Waveform



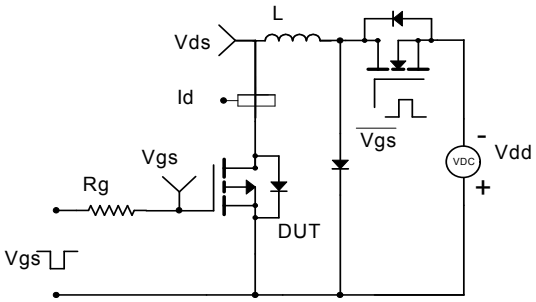


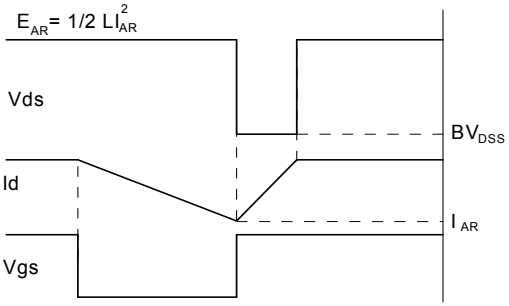
Resistive Switching Test Circuit & Waveforms



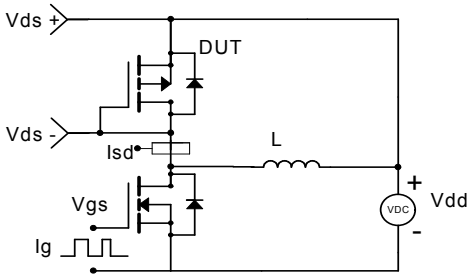


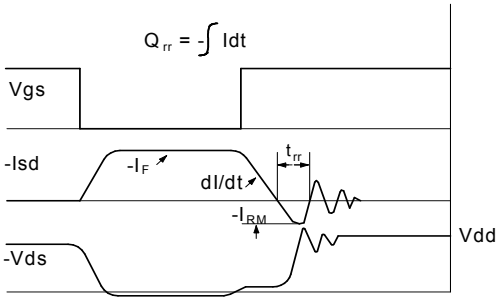
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



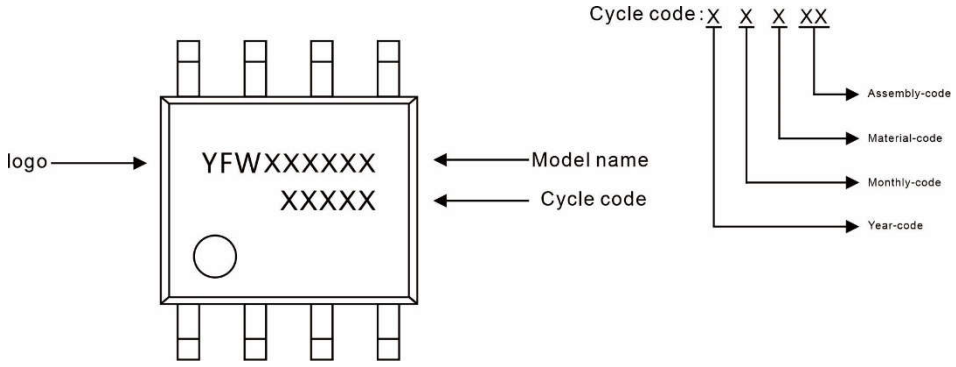


Diode Recovery Test Circuit & Waveforms





Marking Diagram

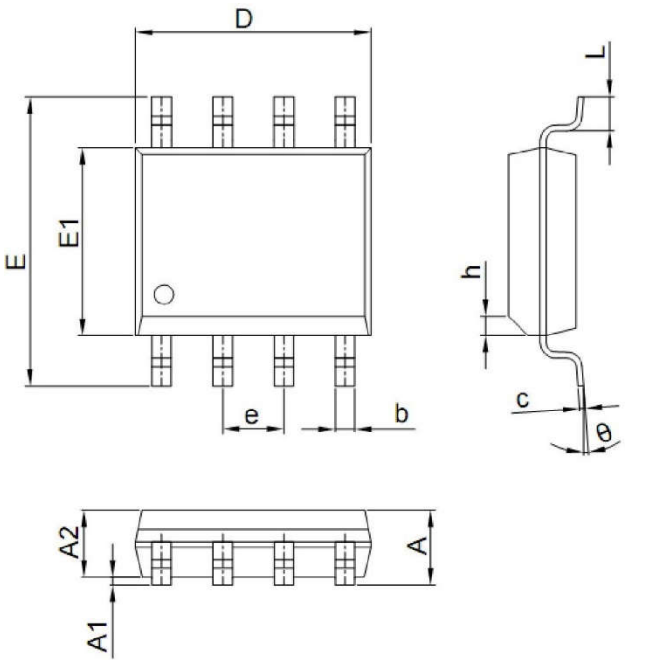


Ordering information

Package	Packing Description	Packing Quantity
SOP-8	Tape/Reel,13"reel	3000PCS/Reel 30000PCS/Carton

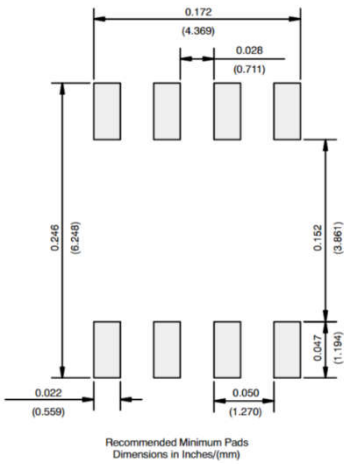
Package Dimensions

SOP-8



Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
A2	1.35	1.50	0.053	0.059
b	0.35	0.55	0.014	0.022
c	0.15	0.25	0.006	0.010
D	4.80	5.00	0.189	0.197
D1	3.10	3.50	0.122	0.138
E	5.80	6.20	0.228	0.244
E1	3.80	4.00	0.150	0.157
E2	2.20	2.60	0.087	0.102
e	1.27 (BSC)		0.050 (BSC)	
L	0.40	1.27	0.016	0.050
θ	0°	8°	0°	8°

The recommended mounting pad size



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