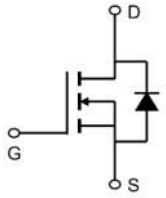
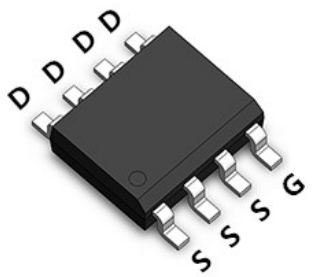
100V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	15A
V_{DSS}	100V
R_{DSON}-typ(@V_{GS}=10V)	＜7.8mΩ(Typ:6.6 mΩ)





SOP-8

Description

- Trench Power MV MOSFET technology
- Low $R_{DS(ON)}$
- Low Gate Charge
- Optimized for fast-switching applications

Applications

- Synchronus Rectification in DC/DC and AC/DC Converters
- Industrial and Motor Drive applications

Absolute Maximum Ratings T_A=25°C unless otherwise noted

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	100	V
Gate - Source Voltage	V_{GS}	±20	V
Drain Current, V_{GS} [7] @ 10V @T_A=25℃	I_D	15	A
Drain Current, V_{GS} [7] @ 10V @T_A=100℃	I_D	7.5	A
Pulsed Drain Current [3]	I_{DM}	55	A
Avalanche energy L=0.3mH [3]	E_{AS}	150	mJ
Total Power Dissipation[1] @T_A=25℃	P_{Dsm}	3.1	W
Total Power Dissipation[1] @T_A=70℃	P_{Dsm}	2.0	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Maximum Thermal Resistance, Junction ambient	$R_{\theta JA}$	75	°C/W
Maximum Thermal Resistance, Junction-case	$R_{\theta JC}$	24	°C/W

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

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	**V(BR)DSS**	100	107	-	**V**
Zero Gate Voltage Drain Current	V_{DS}=100V , V_{GS}=0V	**I_{DSS}**	-	-	1.0	**μA**
Gate to Body Leakage Current	V_{GS}=±20V, V_{DS}=0V	**I_{GSS}**	-	-	±100	**nA**
Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	**$V_{GS(th)}$**	1.3	1.9	2.5	**V**
Static Drain-Source on-Resistance	V_{GS}=10V, I_D=7.5A	**$R_{DS(ON)}$**	-	6.6	7.8	**mΩ**
	V_{GS}=4.5V, I_D=7.5A		-	8.9	10.5	
Forward Transconductance	V_{DS}=5V, I_D=7.5A	**g_{FS}**	30	-	-	**S**
Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	**R_g**	-	2	-	**Ω**
Input Capacitance	V_{DS}=15V V_{GS}=0V f=1.0MHz	**C_{iss}**	-	2808	-	**pF**
Output Capacitance		**C_{oss}**	-	961	-	
Reverse Transfer Capacitance		**C_{rss}**	-	23	-	
Total Gate Charge(10V)	V_{DS}=50V V_{GS}=10V I_D=7.5A	**Q_g**	-	50	-	**nC**
Total Gate Charge(4.5V)		**Q_g**	-	33		
Gate-Source Charge		**Q_{gs}**	-	17	-	
Gate-Drain("Miller") Charge		**Q_{gd}**	-	11	-	
Turn-on delay time	V_{GS}=10V V_{DS}=50V R_L=2.5Ω R_{GEN}=3Ω	**$t_{d(on)}$**	-	15	-	**ns**
Turn-on Rise Time		**T_r**	-	12	-	
Turn-Off Delay Time		**$t_{d(OFF)}$**	-	25	-	
Turn-Off Fall Time		**t_f**	-	13	-	
Continuous Source Current [7]		**I_S**	-	-	48	**A**
Diode Forward Voltage	V_{GS}=0V , I_S=1A	**V_{SD}**	-	0.7	0.95	**V**
Body Diode Reverse Recovery Time	I_F=15A,di/dt=500A/μs	**trr**		45		**ns**
Body Diode Reverse Recovery charge	I_F=15A,di/dt=500A/μs	**Qrr**		140		**nC**

Note :

1. The value of RθJA is measured with the device mounted on 1in2 FR - 4 board with 2oz. Copper, in a still air environment with T_A =25°C. The Power dissipation PDSM is based on RθJA t≤ 10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
2. The power dissipation PD is based on TJ(MAX)=150°C, using junction - to - case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
3. Single pulse width limited by junction temperature TJ(MAX)=150°C.
4. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case RθJC and case to ambient.
5. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.
6. These curves are based on the junction - to - case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)}$=150°C. The SOA curve provides a single pulse rating.
7. The maximum current rating is package limited.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

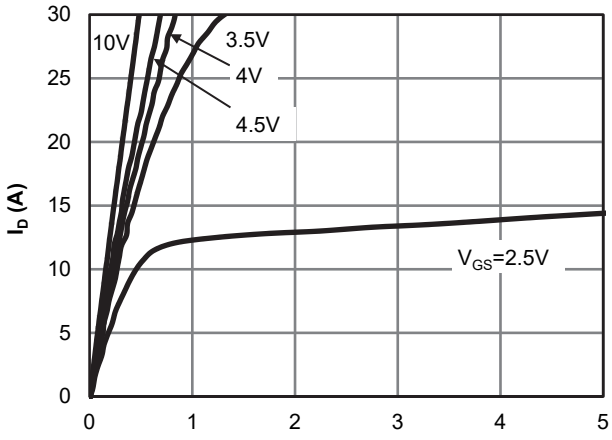


Fig 1: On-Region Characteristics

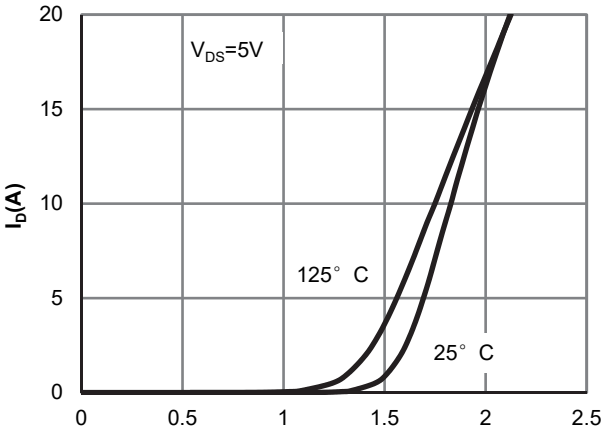


Figure 2: Transfer Characteristics

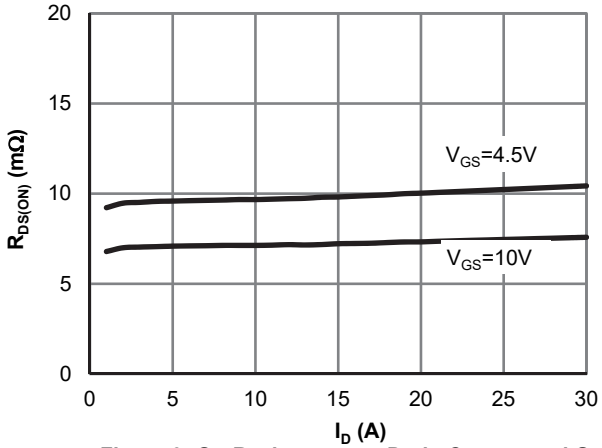


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

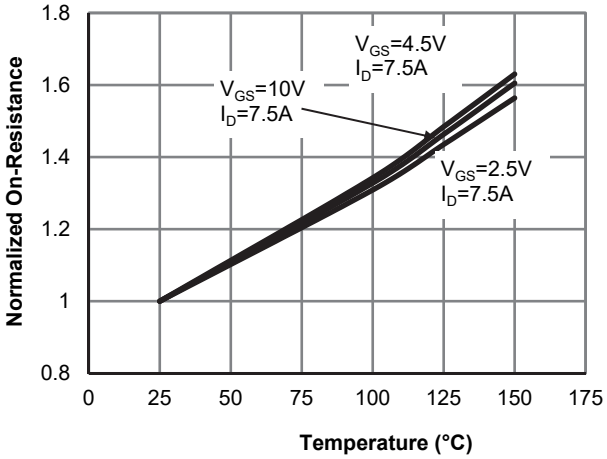


Figure 4: On-Resistance vs. Junction Temperature

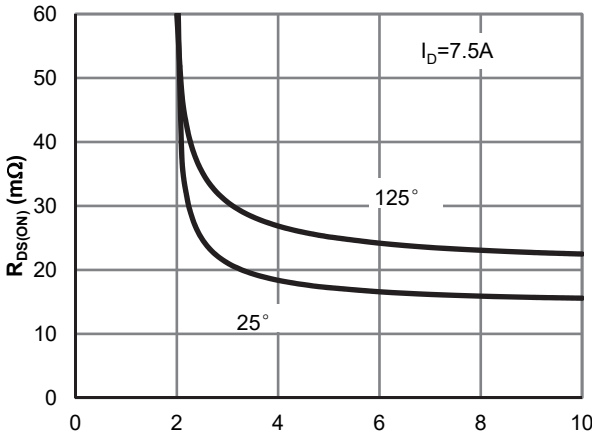


Figure 5: On-Resistance vs. Gate-Source Voltag

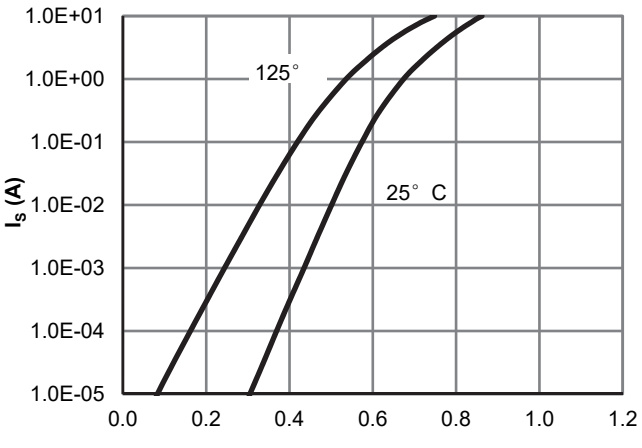


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

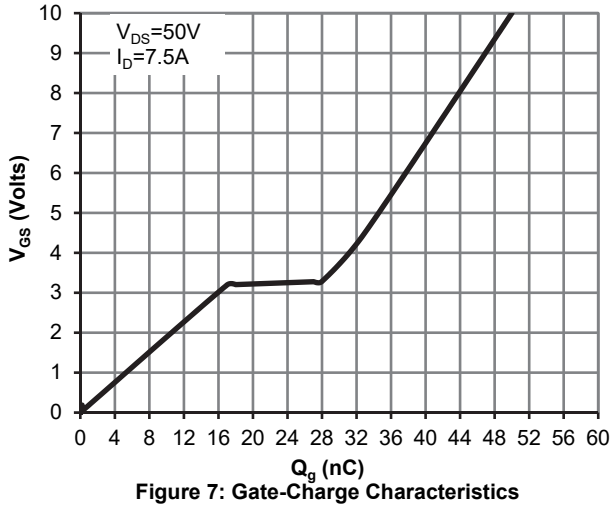


Figure 7: Gate-Charge Characteristics

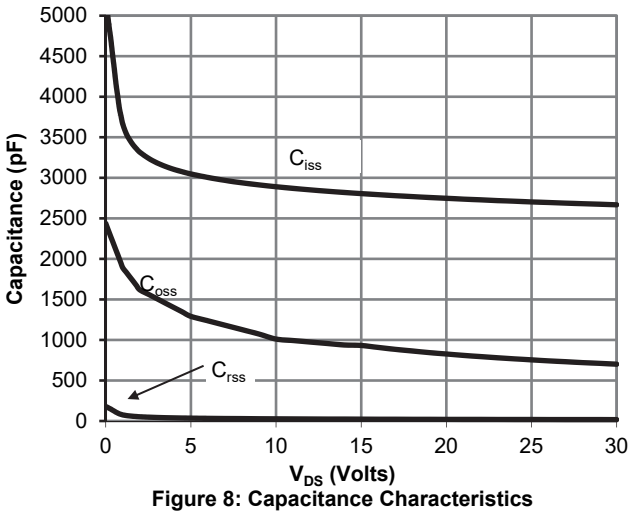
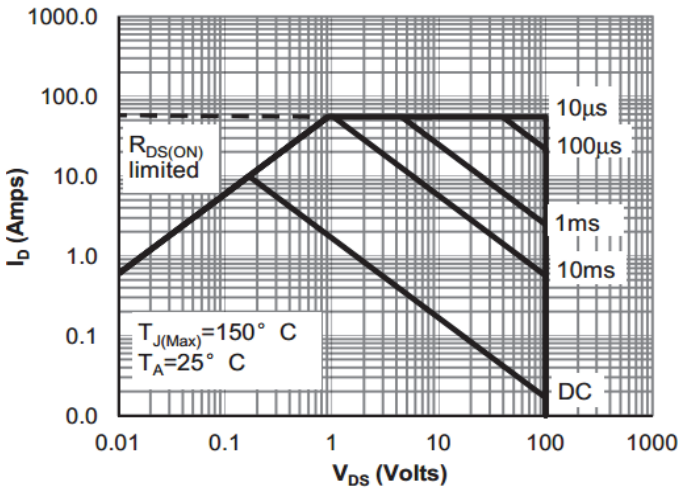


Figure 8: Capacitance Characteristics



V_{GS}> or equal to 4.5V

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

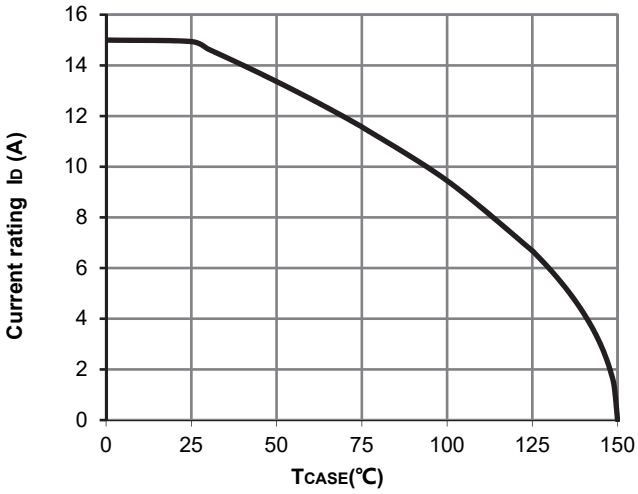


Figure 10: Current De-rating (Note F)

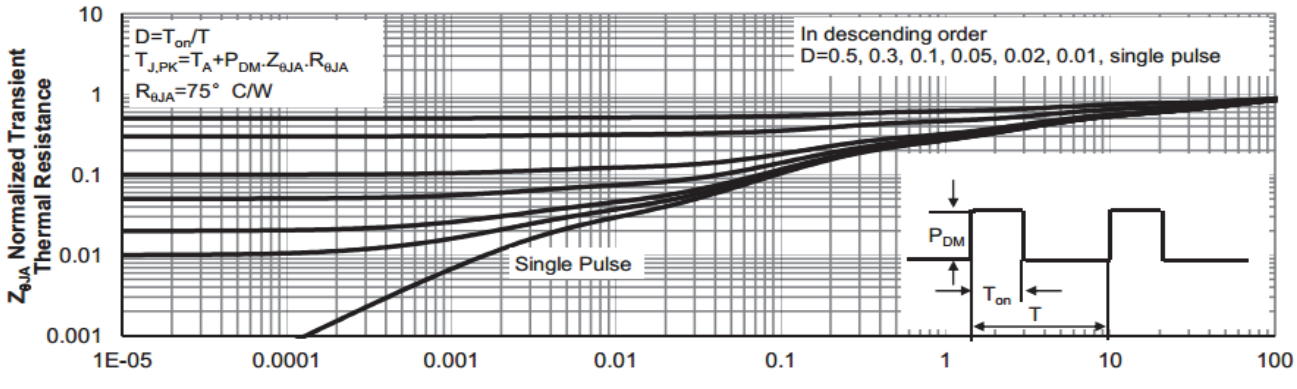


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

Figure A: Gate Charge Test Circuit & Waveforms

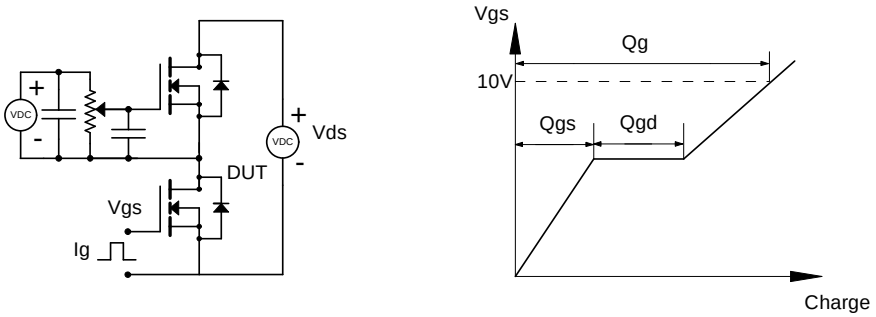


Figure B: Resistive Switching Test Circuit & Waveforms

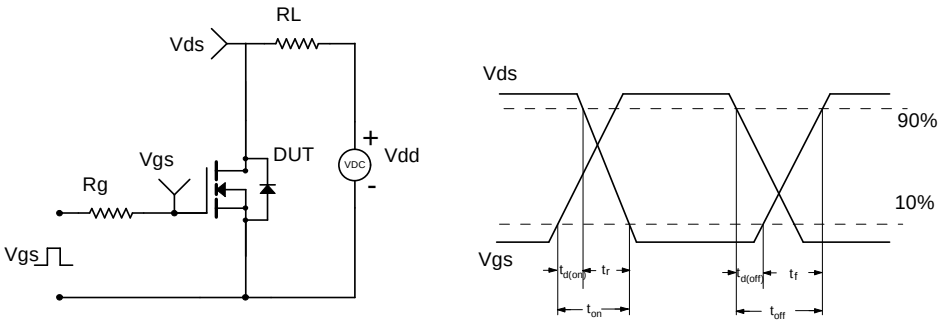


Figure C: Unclamped Inductive Switching (UIS) Test

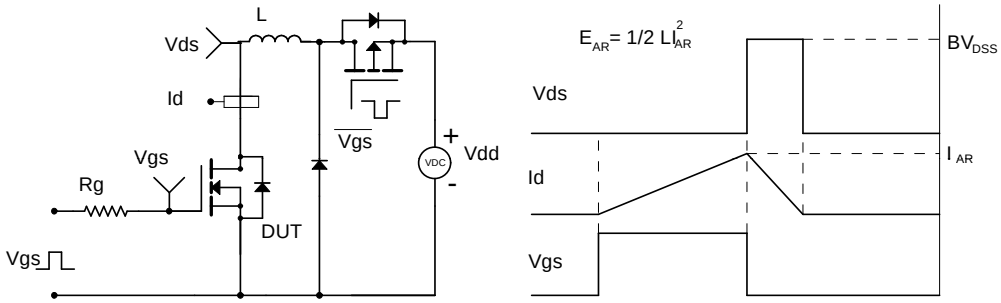
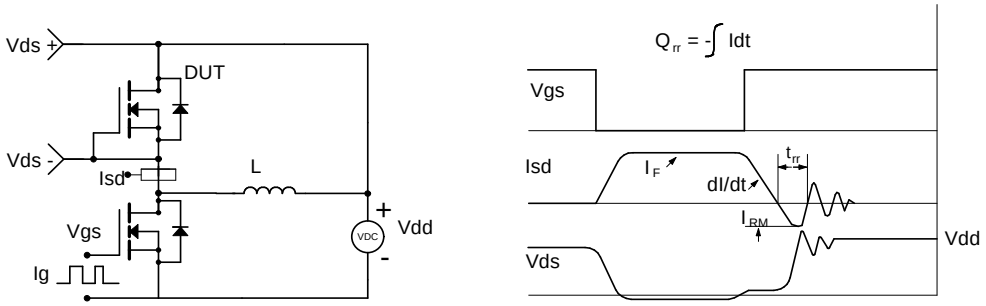
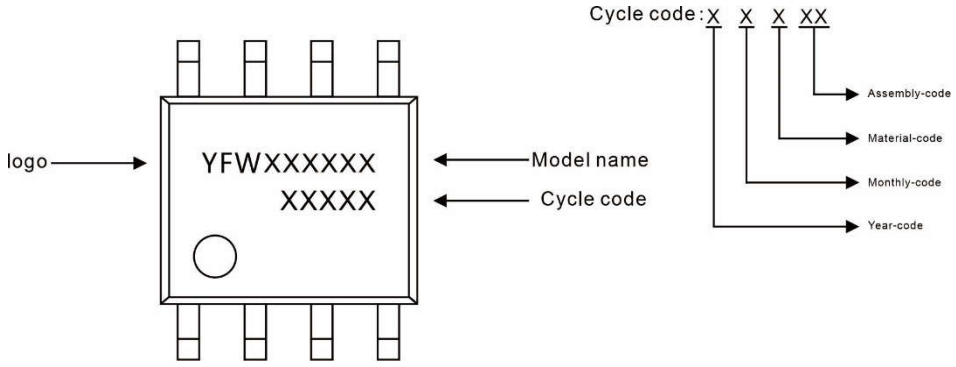


Figure D: Diode Recovery Test Circuit & Waveforms



Marking Diagram

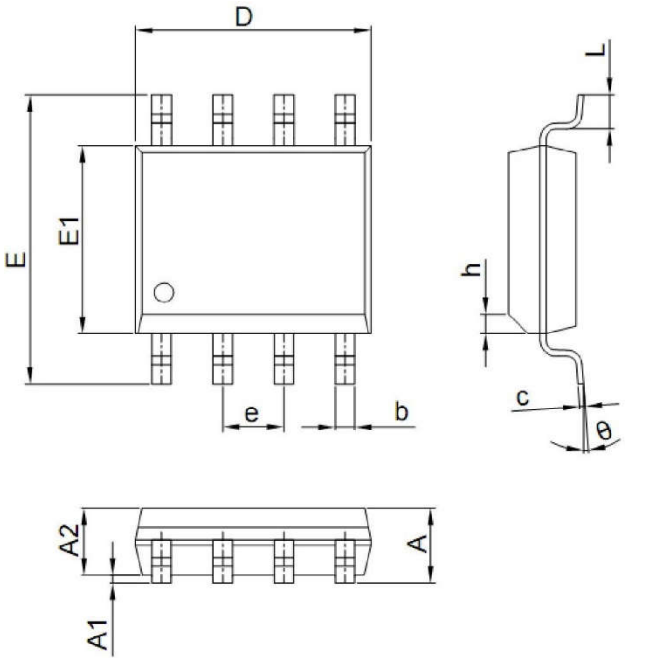


Ordering information

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

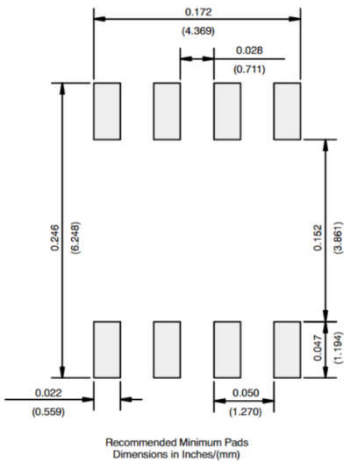
Package Dimensions

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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