

20V P-Channel Enhancement Mode MOSFET**Description**

The PECN2307SR uses advanced trench technology to provide excellent $R_{DS(ON)}$, 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.

General Features

- ◆ $V_{DS} = -20V$, $I_D = -9A$
 $R_{DS(ON)}(\text{Typ.}) = 22m\Omega$ @ $V_{GS} = -2.5V$
 $R_{DS(ON)}(\text{Typ.}) = 17m\Omega$ @ $V_{GS} = -4.5V$
- ◆ High power and current handing capability
- ◆ Lead free product is acquired
- ◆ Surface mount package

Application

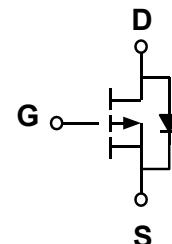
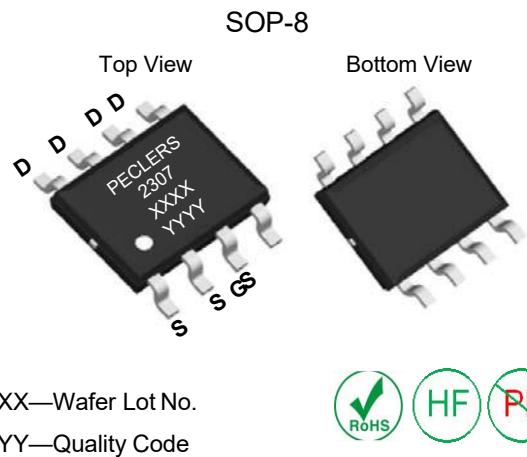
- ◆ PWM applications
- ◆ Load switch

Package

100% UIS TESTED!

- ◆ SOP-8

100% ΔV_{ds} TESTED!

Schematic diagram**Marking and pin assignment**

XXXX—Wafer Lot No.
YYYY—Quality Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN2307SR	-55°C to +150°C	SOP-8	4000

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

parameter	symbol	limit	unit
Drain-source voltage	V_{DS}	-20	V
Gate-source voltage	V_{GS}	± 12	V
Continuous Drain Current TC=25°C	I_D	-9	A
TC=70°C		-7	
Pulsed Drain Current	I_{DP}	-36	A
Power Dissipation TC=25°C	P_D	3	W
TC=70°C		2.1	
Operating junction Temperature range	T_j	-55—150	°C

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =-250μA	-20	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V	-	-	-1	μA
Gate-body leakage	I _{GSS}	V _{DS} =0V, V _{GS} =±12V	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.5	-0.7	-1.0	V
Drain-source on-state resistance	R _{DSON}	V _{GS} =-4.5V, I _D =-9A	-	17	22	mΩ
		V _{GS} =-2.5V, I _D =-6A	-	22	27	
		V _{GS} =-1.8V, I _D =-3A	-	30	37	
Forward transconductance	g _f	V _{DS} =-5V, I _D =-9A	-	12	-	S
Dynamic Characteristics						
Input capacitance	C _{ISS}	V _{DS} =-10V, V _{GS} =0V f=1.0MHz	-	2100	-	pF
Output capacitance	C _{OSS}		-	498	-	
Reverse transfer capacitance	C _{RSS}		-	300	-	
Switching Characteristics						
Turn-on delay time	t _{D(ON)}	V _{DD} =-10V I _D =-9A V _{GEN} =-4.5V R _L =10ohm R _{GEN} =-6ohm	-	25	-	ns
Rise time	t _r		-	30	-	
Turn-off delay time	t _{D(OFF)}		-	70	-	
Fall time	t _f		-	50	-	
Total gate charge	Q _g	V _{DS} =-10V, I _D =-9A V _{GS} =-4.5V	-	17	-	nC
Gate-source charge	Q _{gs}		-	4.1	-	
Gate-drain charge	Q _{gd}		-	4.3	-	
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode forward voltage	V _{SD}	V _{GS} =0V, I _s =-1.25A	-	-0.81	-1.2	V

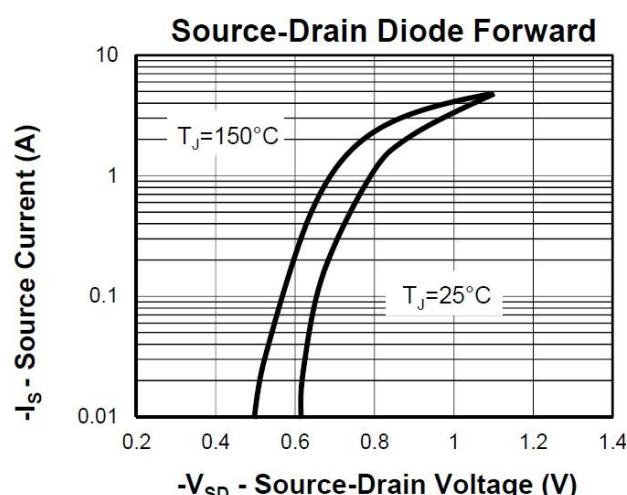
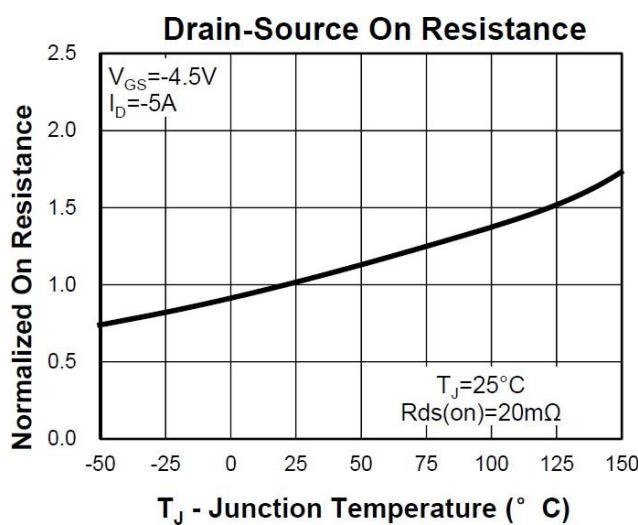
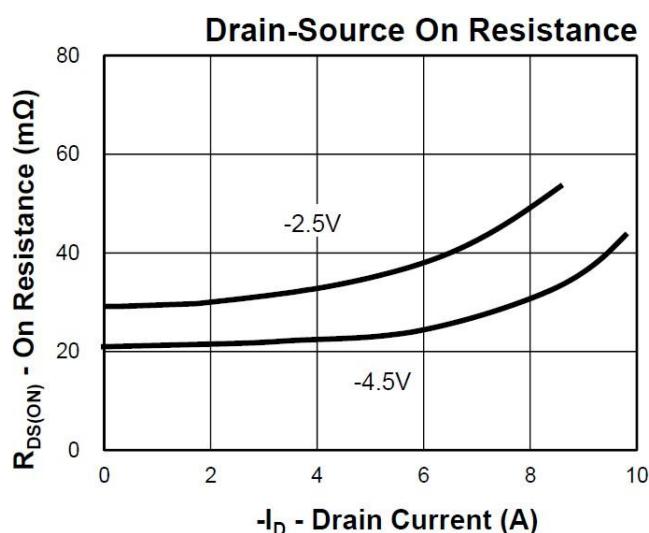
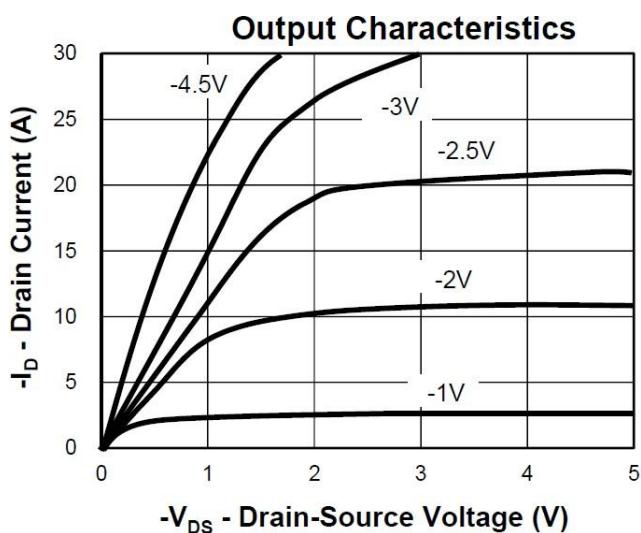
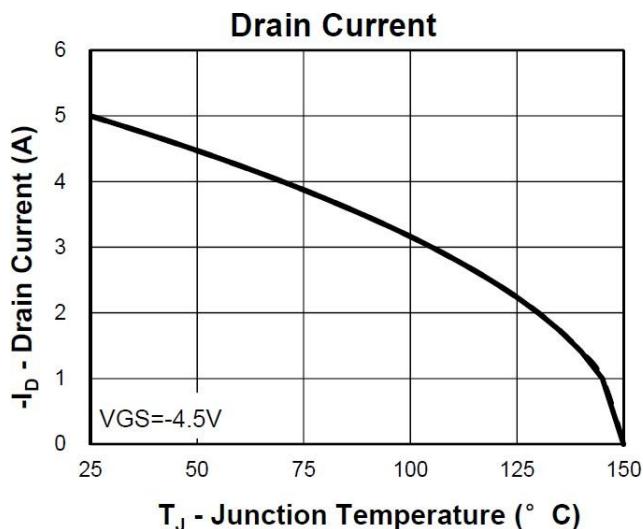
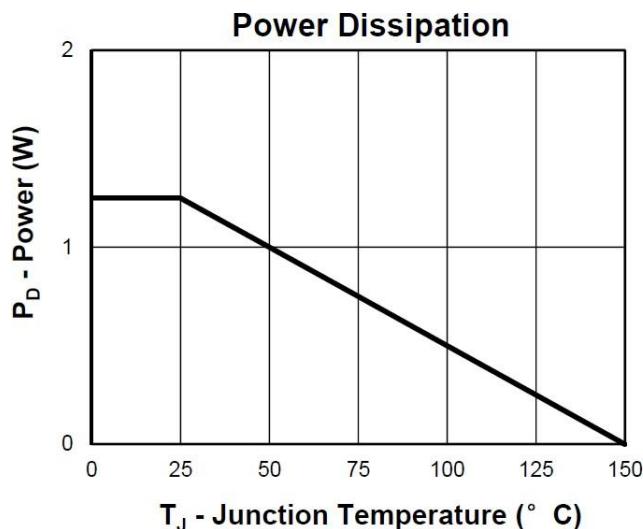
Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient ^A	≤ 10s	R _{θJA}	33	40
Maximum Junction-to-Ambient ^A	Steady-State		59	75
Maximum Junction-to-Lead ^B	Steady-State		16	24

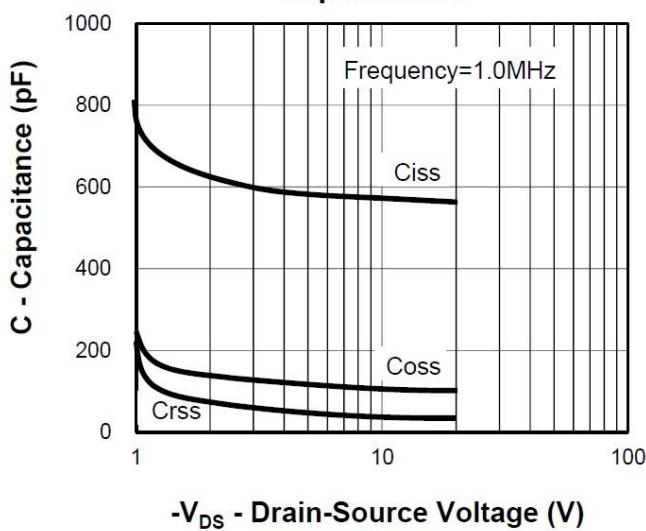
A: The value of R_{θJA} is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

B: The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJC} and lead to ambient.

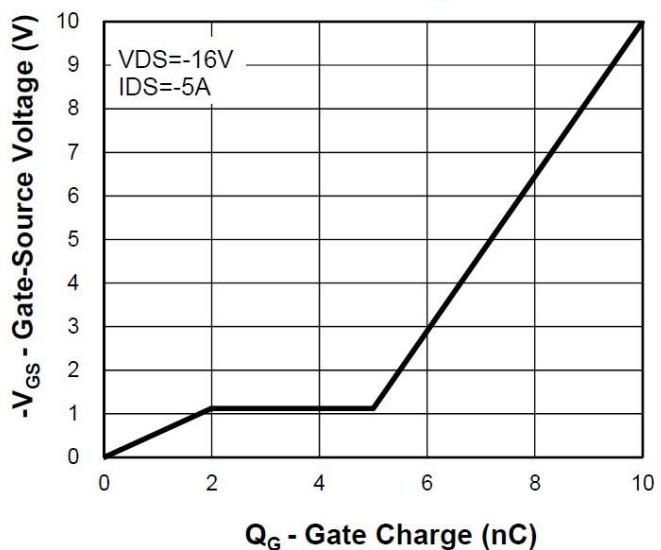
Typical Performance Characteristics



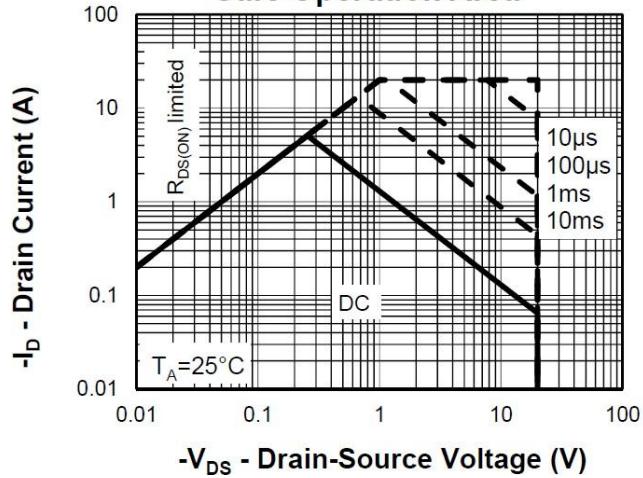
Capacitance



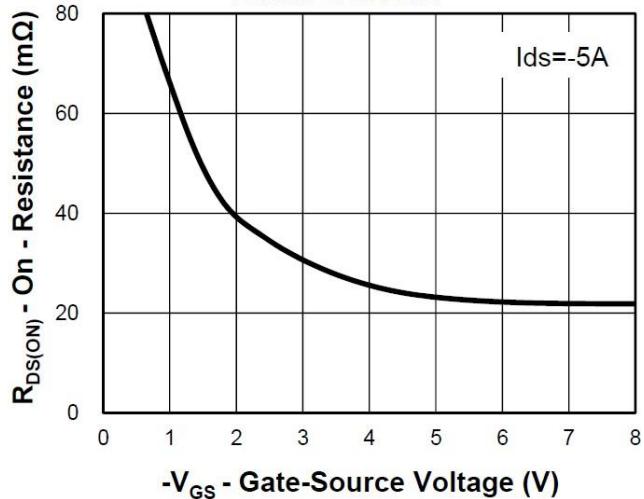
Gate Charge



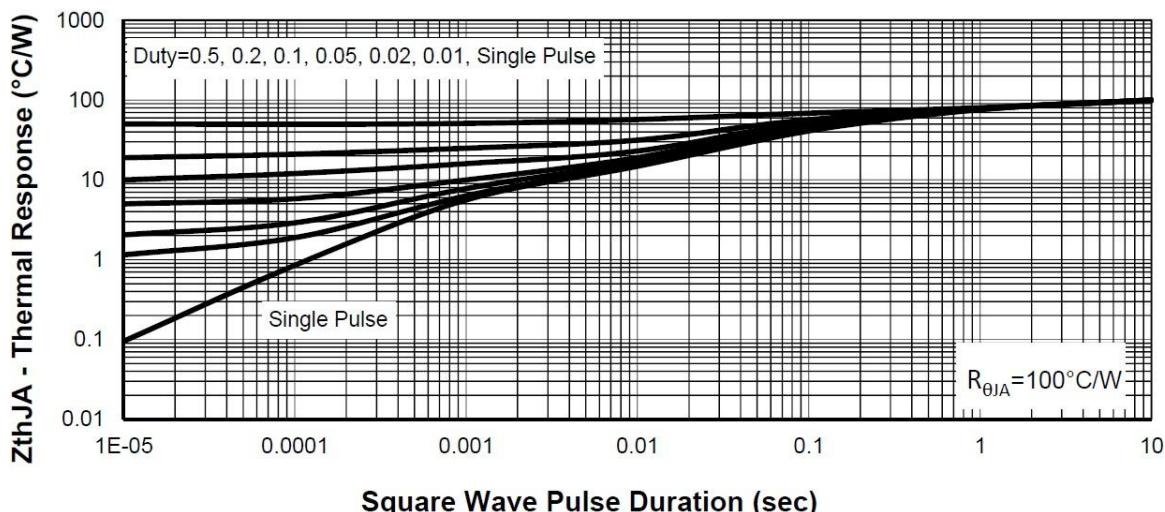
Safe Operation Area



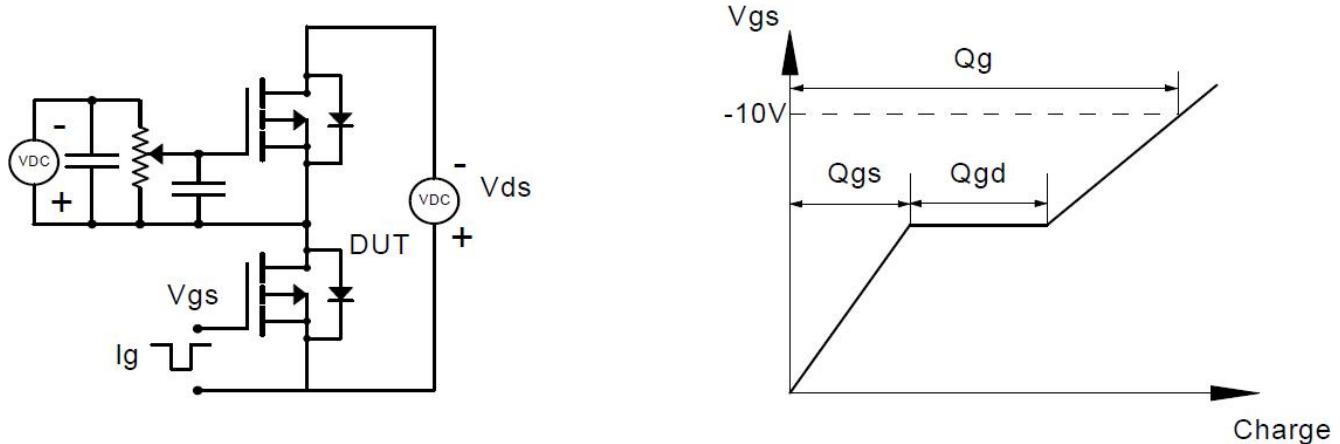
Drain Current



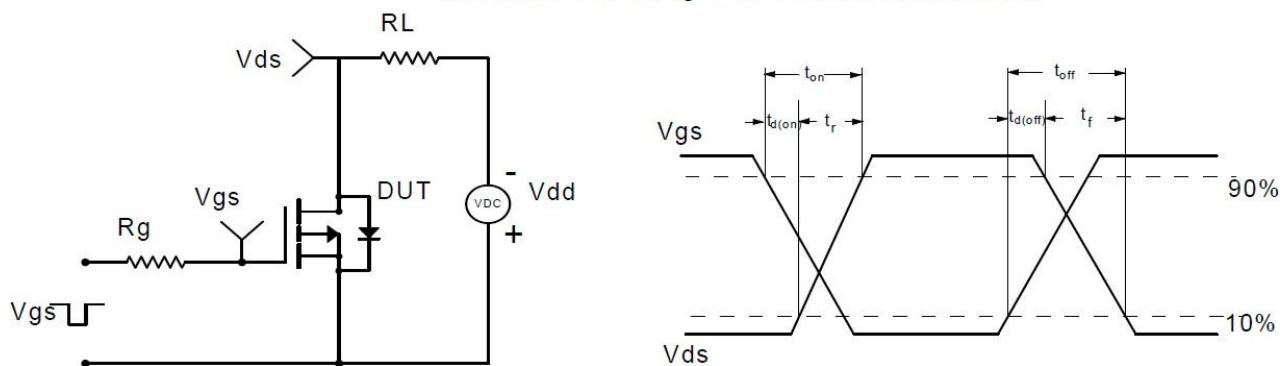
Thermal Transient Impedance



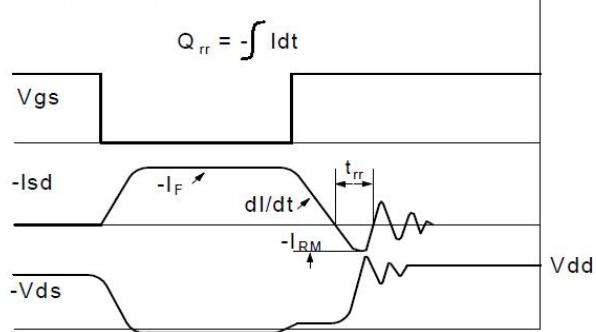
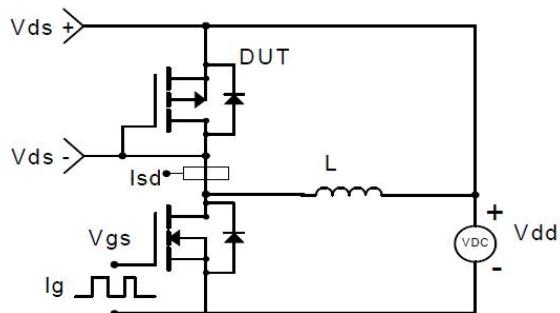
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

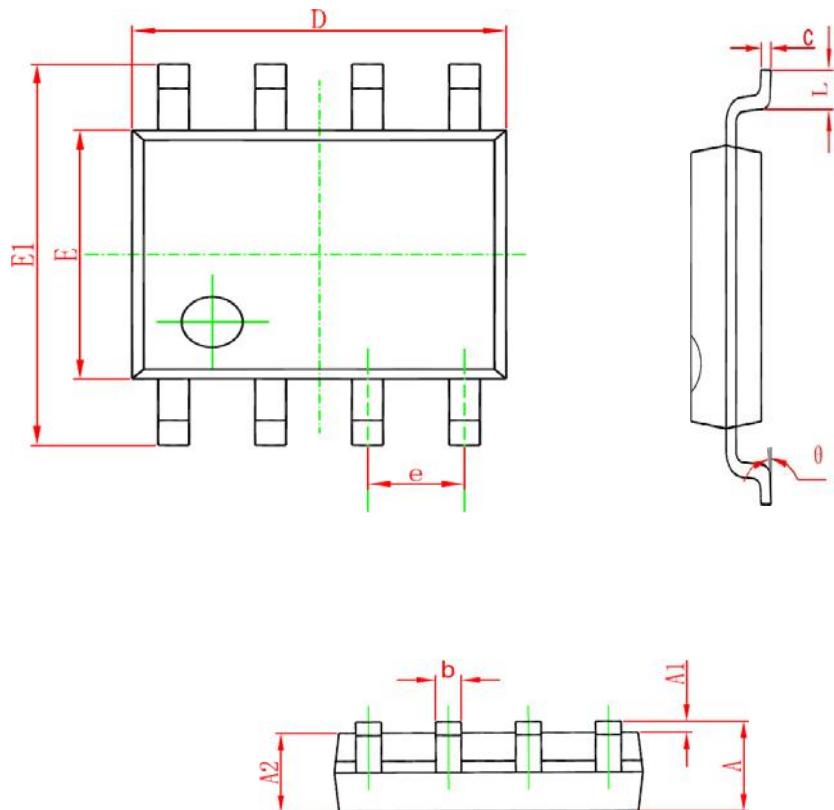


Diode Recovery Test Circuit & Waveforms



Package Information

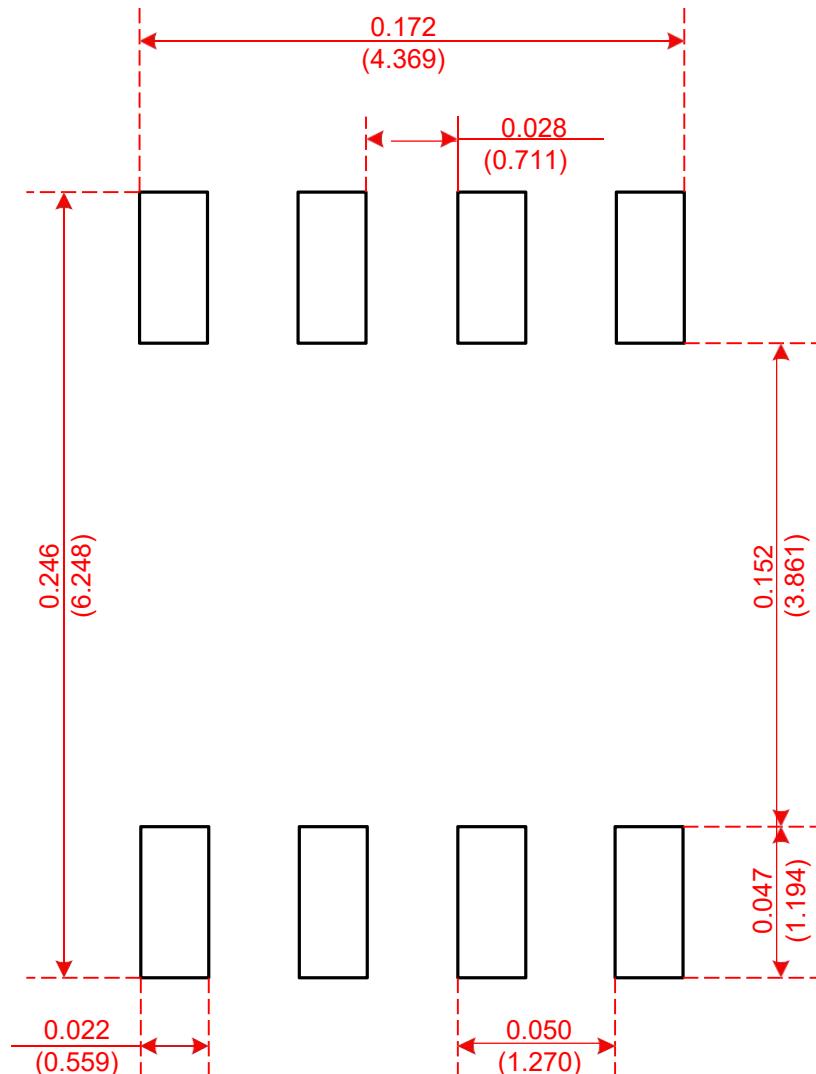
- SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

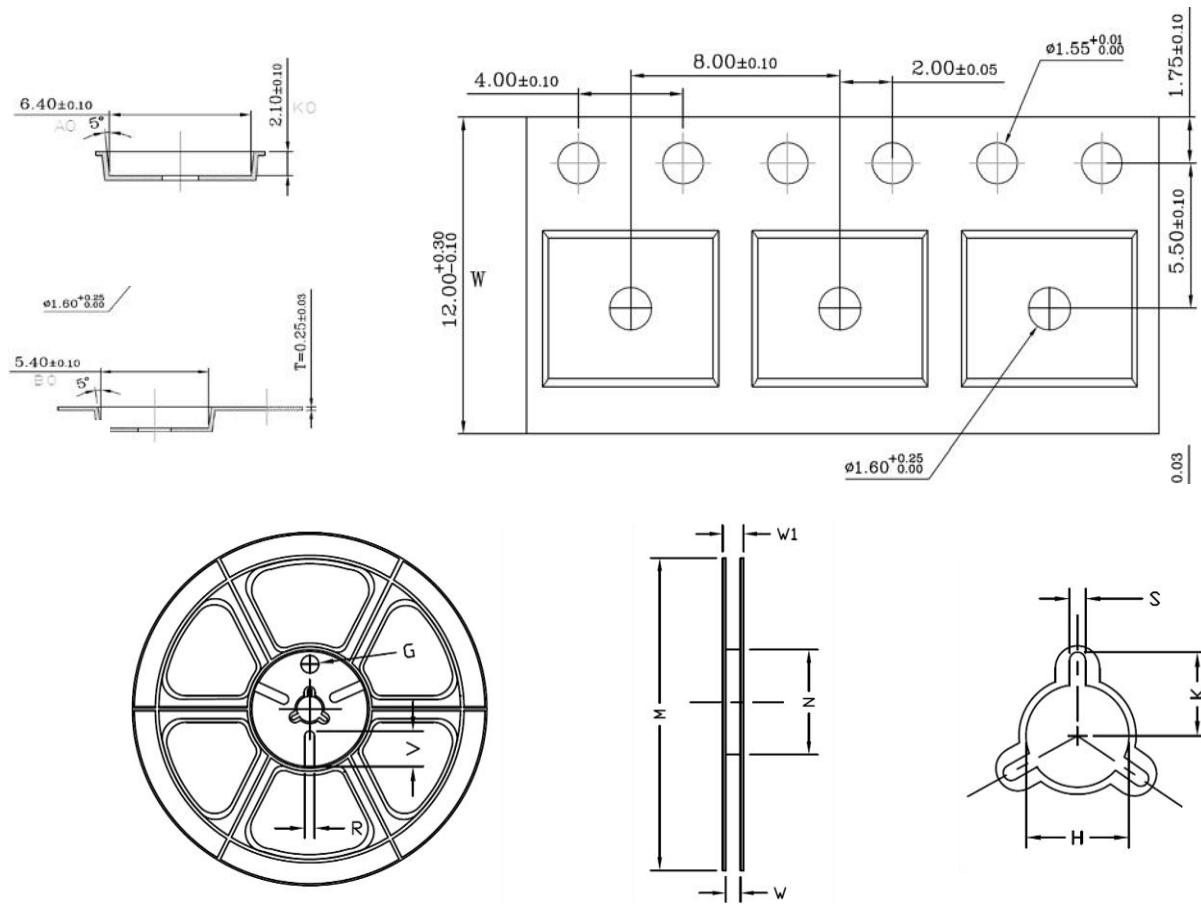
Recommended Minimum Pads

- SOP-8



Tape and Reel

- SOP-8



Tape Size	Reel Size	M	N	W	W1	H	K	S	G	R	V
12mm	Φ330	Φ330.00 ±0.50	Φ97.00 ±0.30	13.00 ±0.30	17.40 ±1.00	Φ13.00 ±0.5	10.6	2.00 ±0.50	—	—	—

