60V N-Channel Enhancement Mode MOSFET

Description

The PECN15N06ER uses trench MOSFET technology that is uniquely optimized to provide the most efficient high frequency switching performance. Conduction and switching losses are minimized due to an extremely low combination of $R_{DS(ON)}$ and Crss.

General Features

- V_{DS} =60V I_D =8A
  $R_{DS(ON)}$(Typ.)=15mΩ @V_{GS}=10V
  $R_{DS(ON)}$(Typ.)=16.5mΩ @V_{GS}=4.5V
- Lead free product is acquired
- Surface mount package

Application

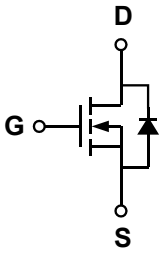
- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load switch

Package

- ESOP-8

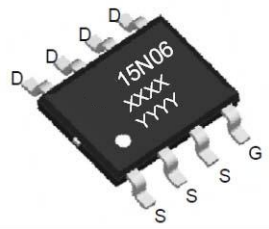
100% UIS TESTED!
100% ΔVds TESTED!

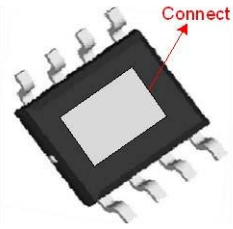
Schematic diagram



Marking and pin assignment

ESOP-8L
（Top View）





XXXX—Date Code

YYYY—Quality Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN15N06E R-G	-55°C to +150°C	ESOP-8	4000

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

parameter		symbol	limit	unit
Drain-source voltage		V_{DS}	60	V
Gate-source voltage		V_{GS}	±20	V
Continuous Drain Current	TC=25°C	I_D	8	A
	TC=100°C		5.6	
Pulsed Drain Current		I_{DP}	32	A
Avalanche energy(L=0.1mH)		EAS	20	mJ
Maximum power dissipation	TC=25°C	P_D	2.5	W
Power Dissipation – Derate above 25℃	TC=25°C		2	
Operating junction Temperature ran	e	Tj	-55—150	℃

Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	60	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=60V, V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	5	
Gate Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.0	1.55	2.5	V
Drain-source on-state resistance[1]	$R_{DS(ON)}$	V_{GS}=10V, I_D=8A	-	15	18	mΩ
		V_{GS}=4.5V, I_D=8A		16.5	20	
On Status Drain Current	$I_{D(ON)}$	V_{DS}=10V, V_{GS}=10V	8	-	-	A
Diode Characteristics						
Diode Forward Voltage[1]	V_{SD}	I_{SD}=1A,V_{GS}=0V	-	0.8	1.1	V
Diode Continuous Forward Current	I_S		-	-	18	A
Reverse Recovery Time	t_{rr}	I_F=8A, dI/dt=100A/us	-	28	-	ns
Reverse Recovery Charge	Q_{rr}		-	40	-	nC
Dynamic Characteristics[2]						
Gate Resistance	R_G	V_{GS}=0V, V_{DS}=0V,f=1MHz	-	3.3	-	Ω
Input capacitance	C_{ISS}	V_{GS}=0V ,V_{DS}=30V f=1.0MHz	-	1600	-	pF
Output capacitance	C_{OSS}		-	112	-	
Reverse transfer capacitance	C_{RSS}		-	98	-	
Turn-on delay time	$t_{D(ON)}$	V_{GS}=10V, V_{DD}=30V, R_L=1Ω, I_D=8A, R_G=3Ω	-	7	-	ns
Turn-on Rise time	tr		-	5.5	-	
Turn-off delay time	$t_{D(OFF)}$		-	29	-	
Turn-off Fall time	tf		-	45	-	
Total gate charge	Q_g	V_{GS}=10V,I_D=8A V_{DS}=30V	-	38.5		nC
Gate-source charge	Q_{gs}			4.7		
Gate-drain charge	Q_{gd}		-	10.3	-	
Drain-Source Diode Characteristics						
Diode forward voltage	V_{SD}	I_{SD}=8A,V_{GS}=0V	-	0.8	1.1	V

Note: 1：Pulse test; pulse width ≦ 300ns, duty cycle ≦ 2%.

2：Guaranteed by design, not subject to production testing.

Thermal Characteristics

Parameter	Symbol	Typical	Unit
Thermal Resistance-Junction to Case	Rθjc	1.7	℃/W
Thermal Resistance junction-to ambient	Rθja	62.5	

Typical Performance Characteristics

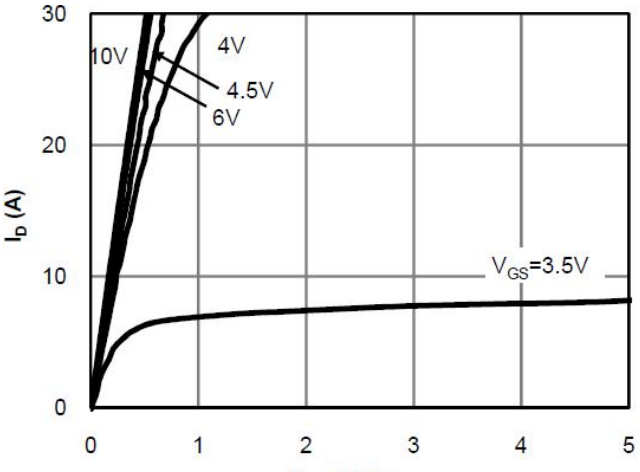


Fig 1: On-Region Characteristics

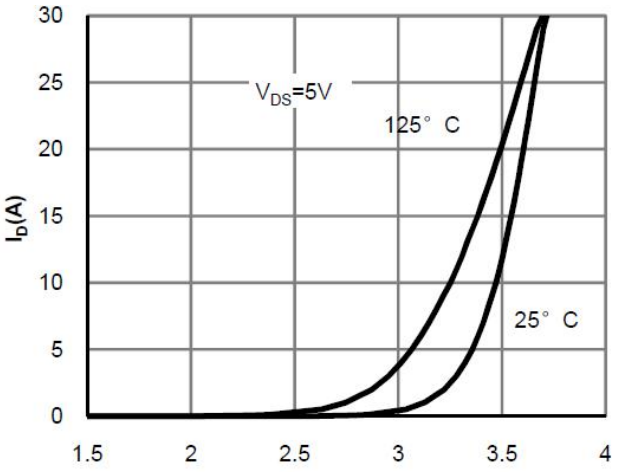


Figure 2: Transfer Characteristics

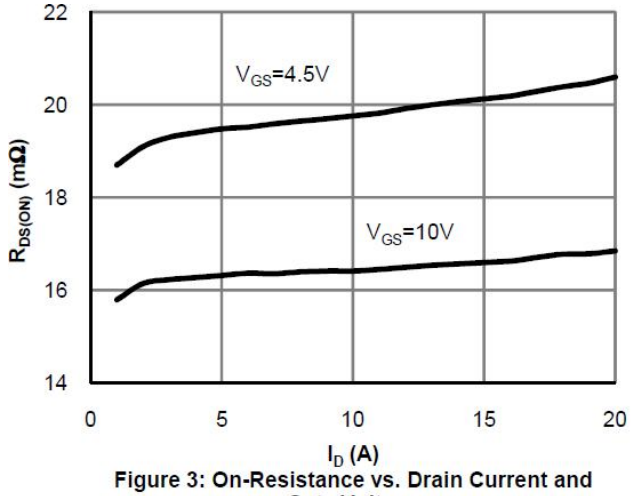


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

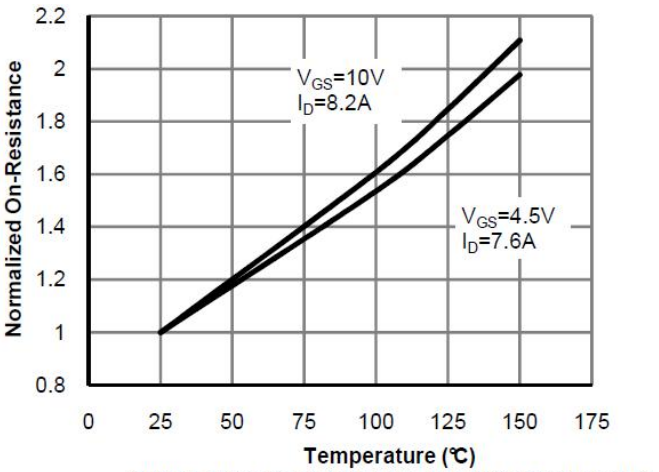


Figure 4: On-Resistance vs. Junction Temperature

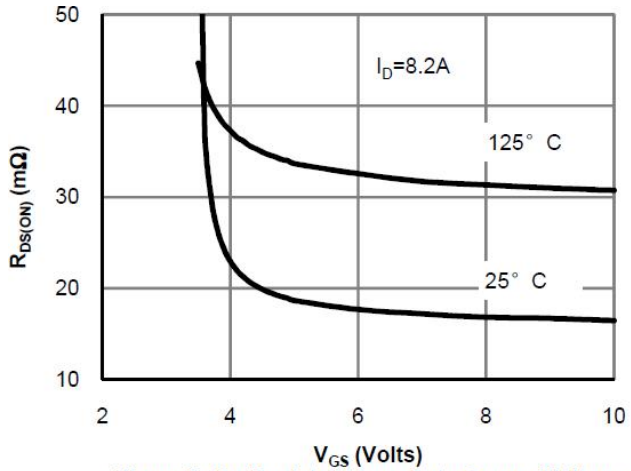


Figure 5: On-Resistance vs. Gate-Source Voltage

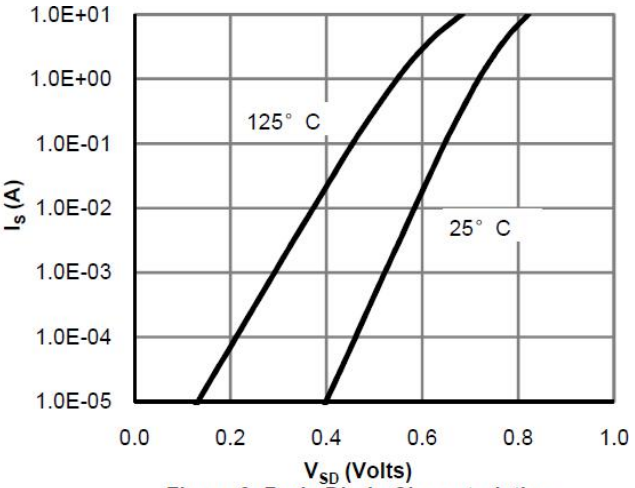


Figure 6: Body-Diode Characteristics

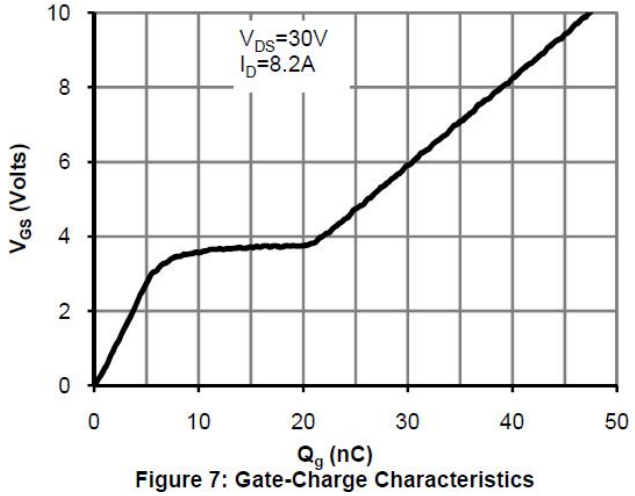


Figure 7: Gate-Charge Characteristics

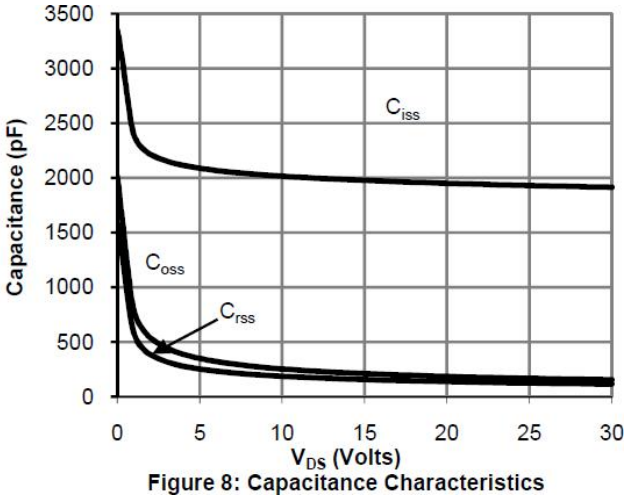


Figure 8: Capacitance Characteristics

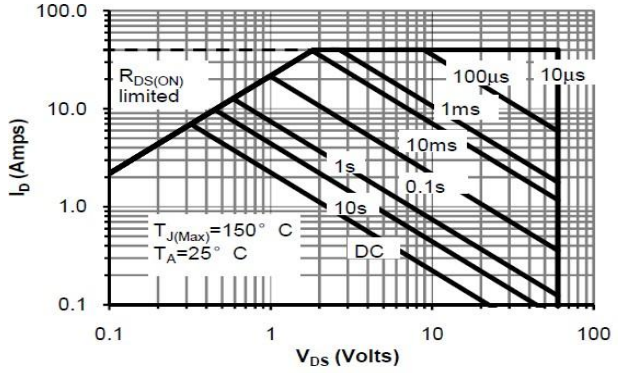


Figure 9: Maximum Forward Biased Safe Operating Area (

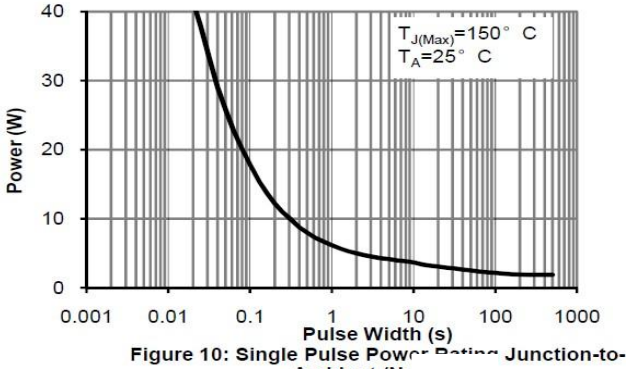


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Nc

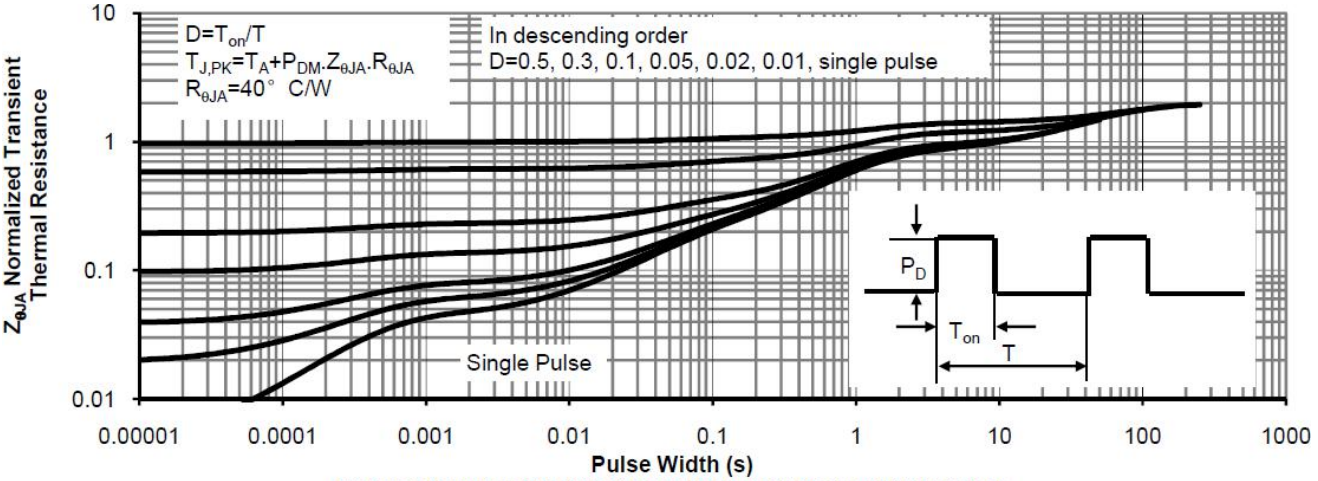
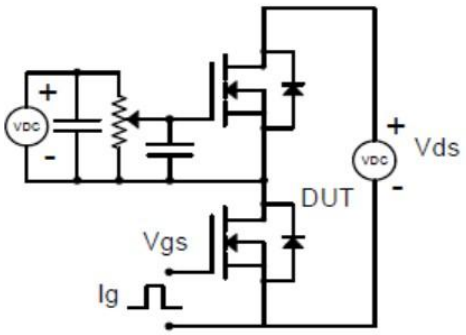
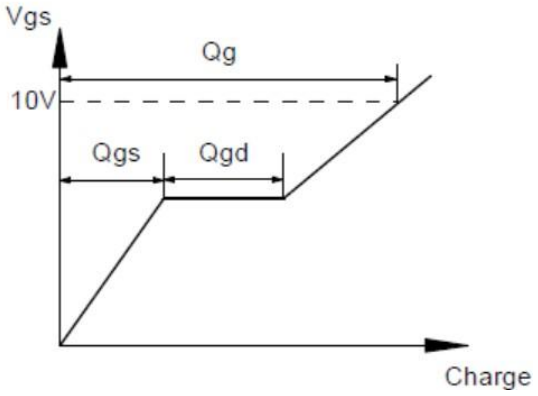


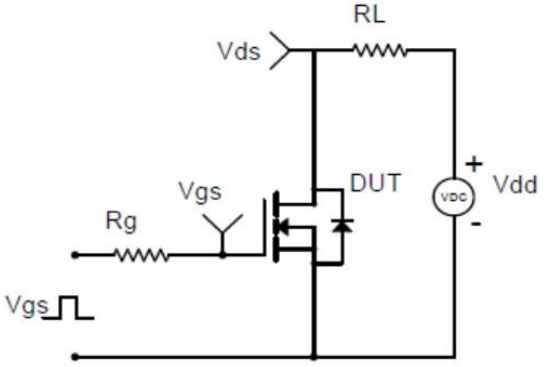
Figure 11: Normalized Maximum Transient Thermal Impedance

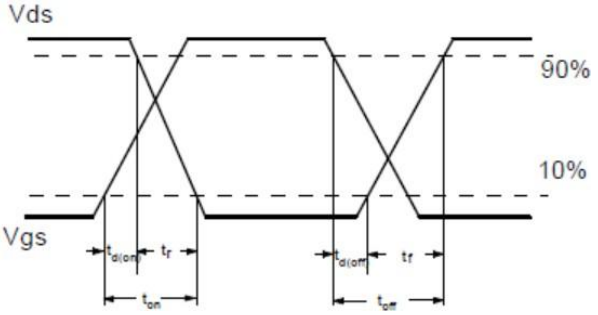
Gate Charge Test Circuit & Waveform



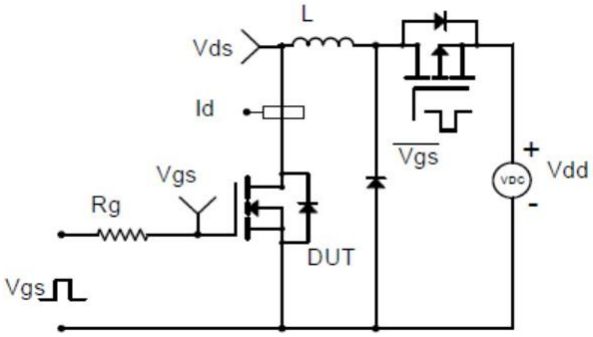


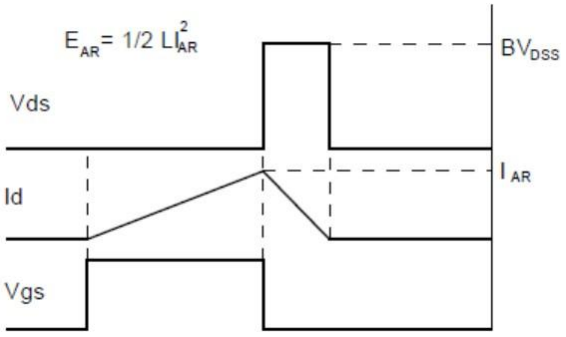
Resistive Switching Test Circuit & Waveforms



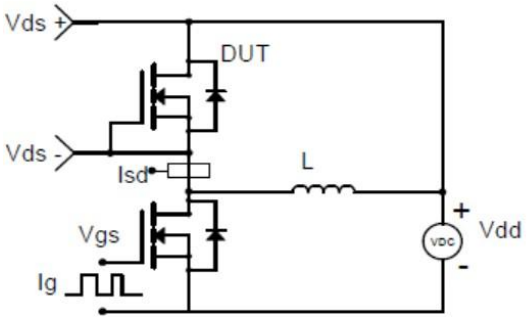


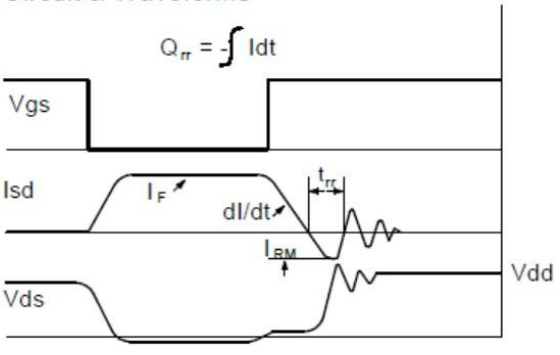
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





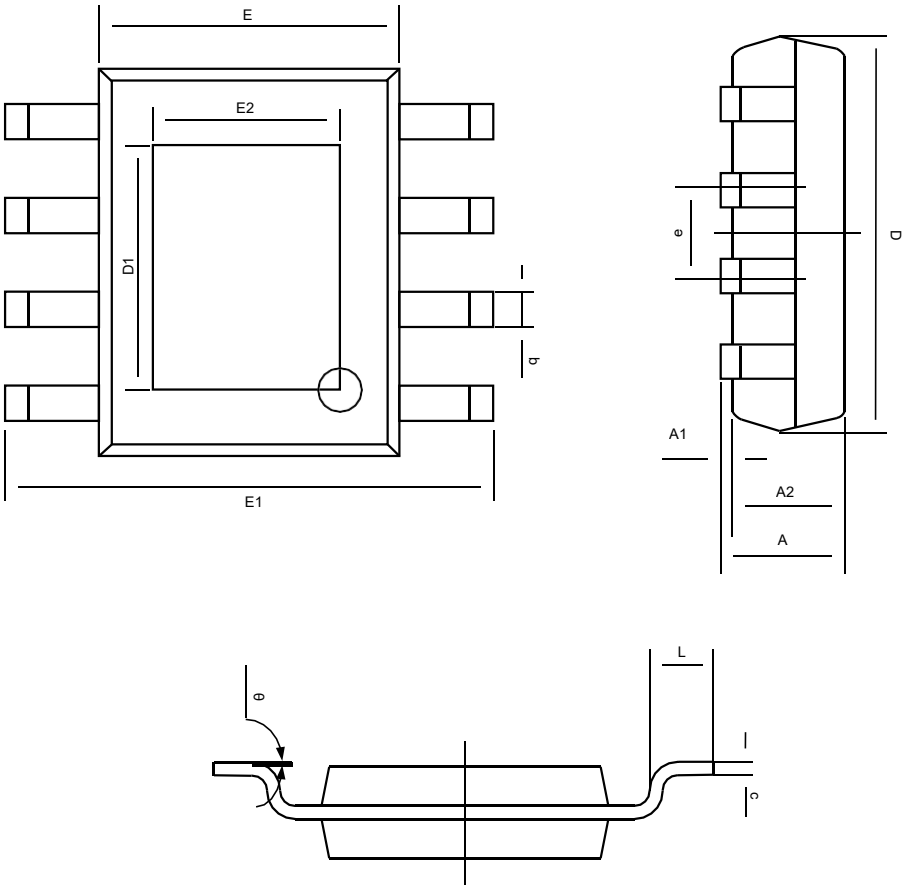
Diode Recovery Test Circuit & Waveforms





Package Information

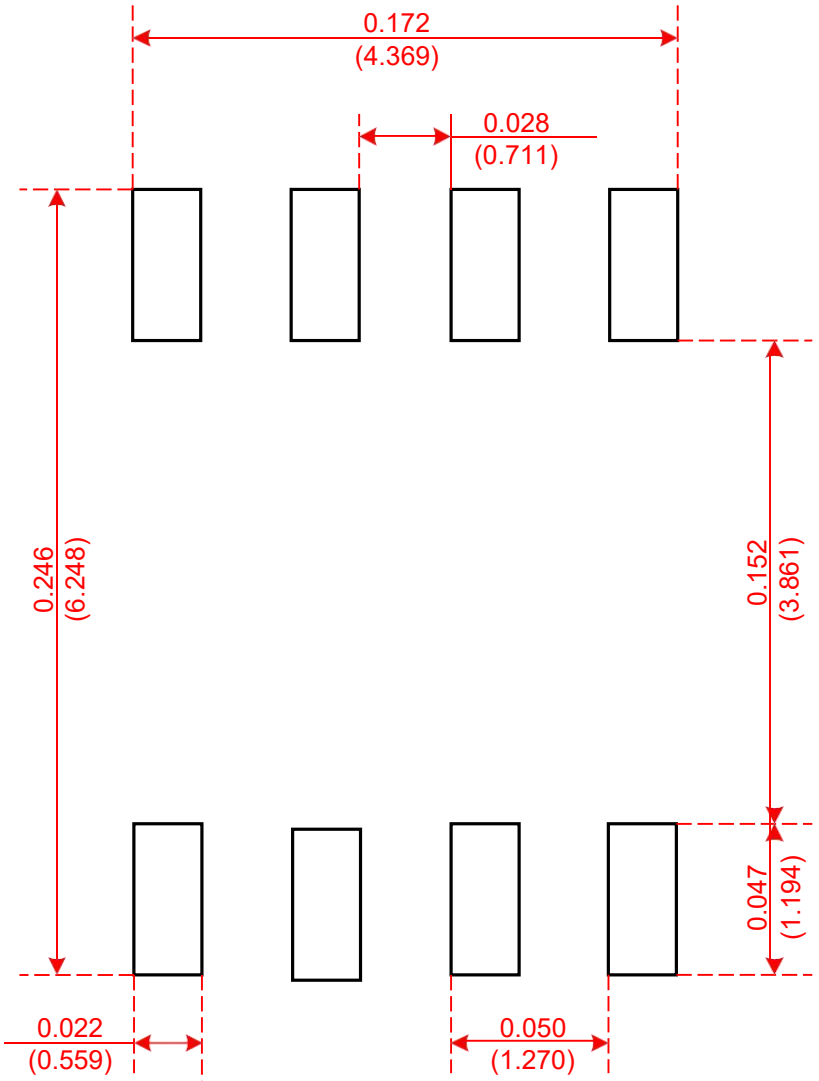
- **ESOP-8**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.050	0.150	0.002	0.006
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.200
D1	3.202	3.420	0.126	0.134
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
E2	2.313	2.513	0.091	0.099
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Recommended Minimum Pads

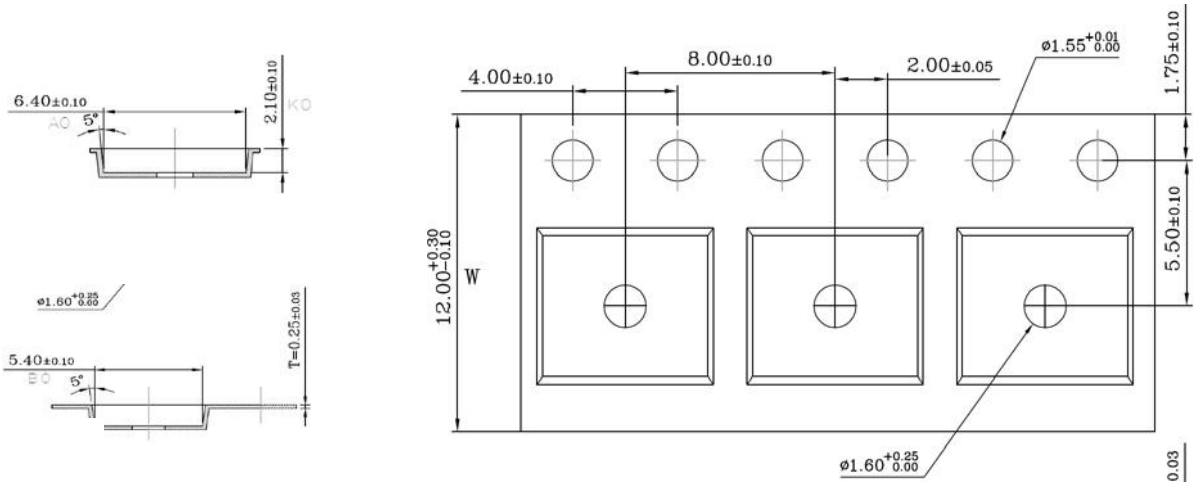
- **ESOP-8**

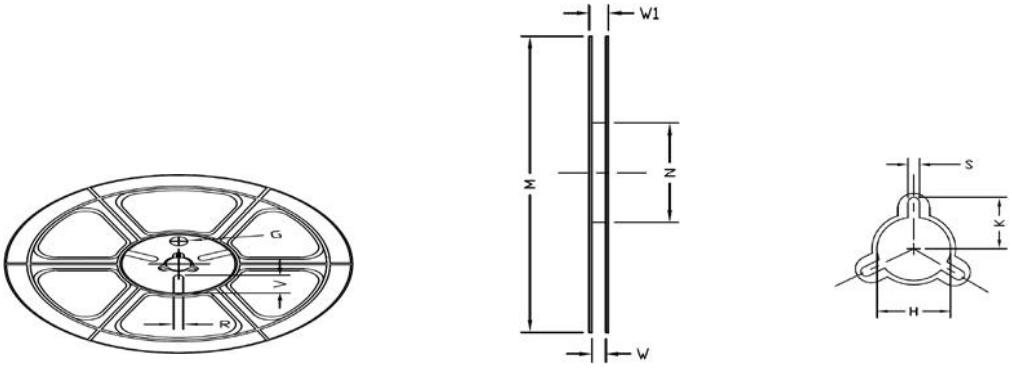


Recommended Minimum Pads
Dimensions in Inches/(mm)

Tape and Reel

- **ESOP-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	—	—	—

Unit Per Reel:
4000pcs