30V P-Channel Enhancement Mode MOSFET

Description

The PECN9P03ER uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in load switch and battery protection applications.

General Features

- V_{DS} =-30V，I_D =-9.0A
  $R_{DS(ON)}$(Typ.)=23mΩ @V_{GS}=-4.5V
  $R_{DS(ON)}$(Typ.)=18mΩ @V_{GS}=-10V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

Application

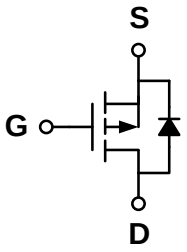
- Battery protection
- Load switch

Package

- ESOP-8

100% UIS TESTED!
100% ΔVds TESTED!

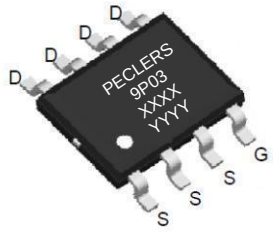
Schematic diagram



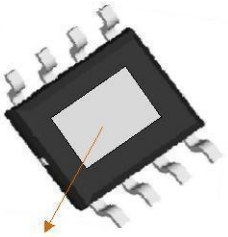
Marking and pin assignment

ESOP-8

Top View



Bottom View



XXXX—Date Code
YYYY—Quality Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN9P03ER	-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}	-30	V
Gate-source voltage	V_{GS}	±20	V
Drain current-continuous[a]@Tj=125℃	I_D	-9.0	A
-pulse *d*[b]	I_{DM}	-36	A
Maximum power dissipation	P_D	1.5	W
Operating junction Temperature range	Tj	-55—150	℃

Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-30	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V	-	-	-1	μA
Gate-body leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.00	-1.67	-3.0	V
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=-9A	-	18	22	mΩ
		V_{GS}=4.5V, I_D=-7A		23	34	
Forward transconductance	gfs	V_{GS}=-5V, I_D=-9A	-	24	-	S
Dynamic Characteristics						
Input capacitance	C_{ISS}	V_{DS}=-15V ,V_{GS}=0V f=1.0MHz	-	1040	1250	pF
Output capacitance	C_{OSS}		-	180	-	
Reverse transfer capacitance	C_{RSS}		-	125	175	
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	V_{DS}=-15V R_L=2.2 Ω V_{GS}=-10V R_{GEN}=3 Ω	-	10	-	ns
Rise time	tr		-	5.5	-	
Turn-off delay time	$t_{D(OFF)}$		-	26	-	
Fall time	tf		-	9	-	
Total gate charge	Qg(10V)	V_{DS}=-15V,I_D=-9A V_{GS}=-10V	-	19	-	nC
Total gate charge	Qg(4.5V)			9.6		
Gate-source charge	Qgs		-	3.6	-	
Gate-drain charge	Qgd		-	4.6	-	
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode forward voltage	V_{SD}	V_{GS}=0V,Is=-1.0A	-	-0.75	-1.0	V

Notes:

a. The value of Rth JA is measured with the device mounted on $1in^2$ FR-4 board with 2oz. Copper, in a still air environment with TA =25°C. The value in any given application depends on the user's specific board design.

b. The power dissipation P_D is based on $T_{J(MAX)}$=150℃, using ≤ 10s junction-to-ambient thermal resistance.

Thermal Characteristics

Thermal Resistance junction-to ambient	Rth JA	90	℃/W

Typical Performance Characteristics

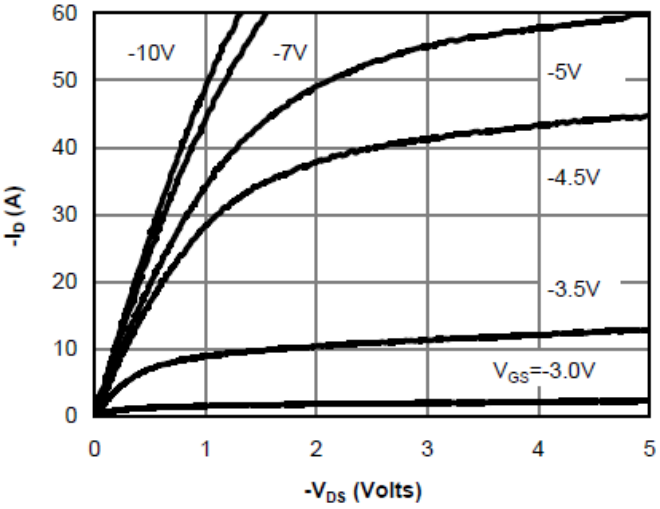


Fig 1: On-Region Characteristics (Note E)

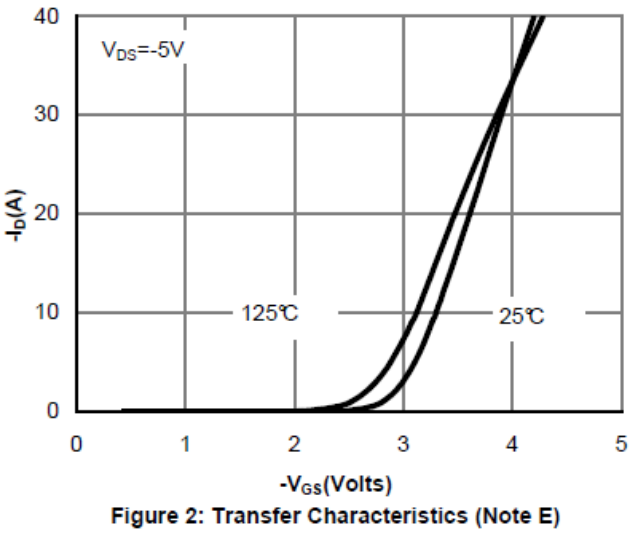


Figure 2: Transfer Characteristics (Note E)

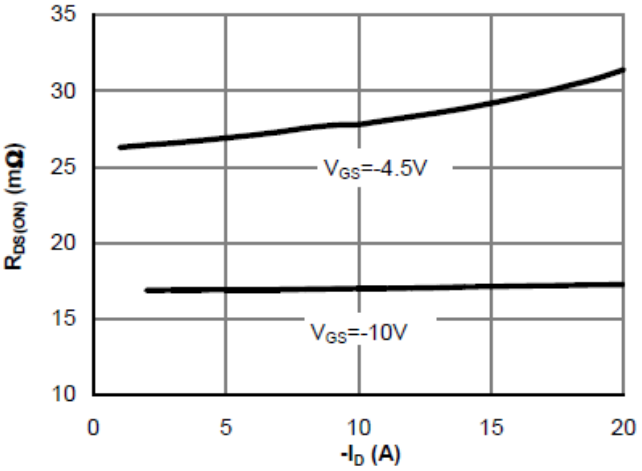


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

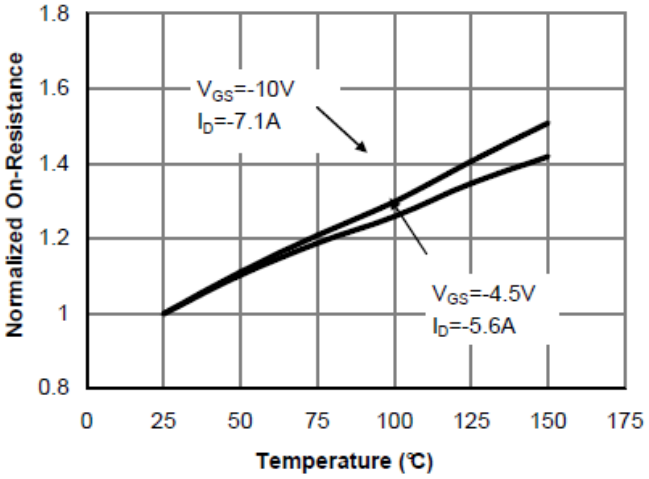


Figure 4: On-Resistance vs. Junction Temperature (Note E)

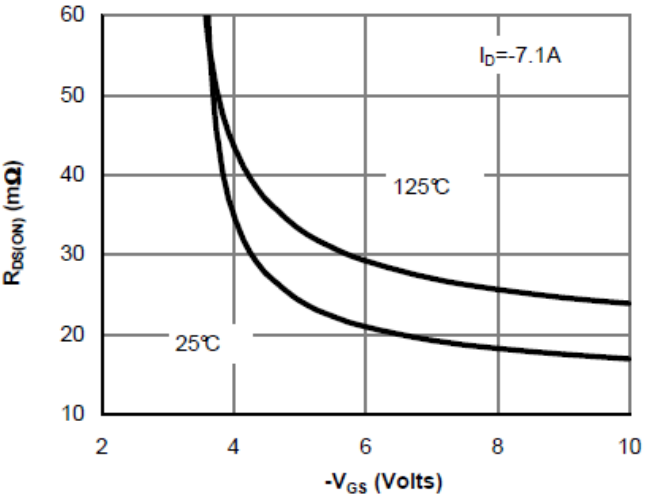


Figure 5: On-Resistance vs. Gate-Source Voltage

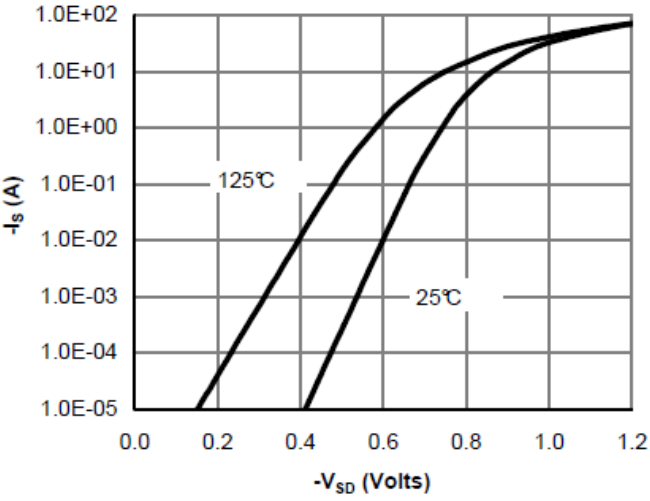


Figure 6: Body-Diode Characteristics (Note E)

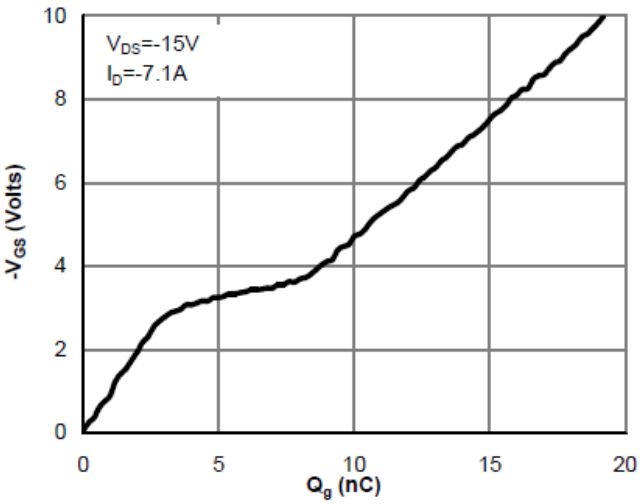


Figure 7: Gate-Charge Characteristics

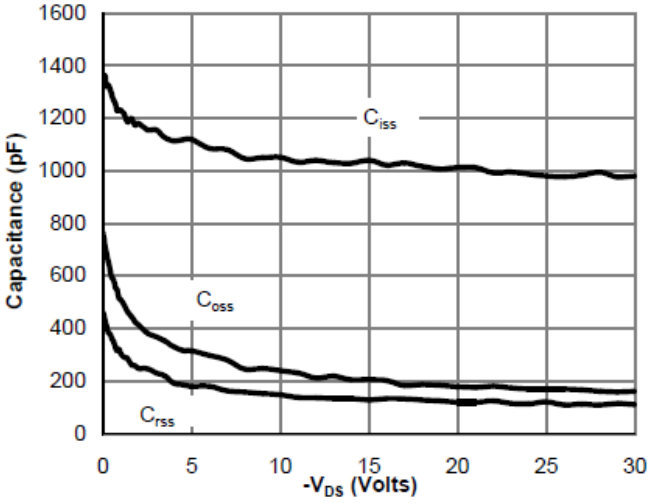


Figure 8: Capacitance Characteristics

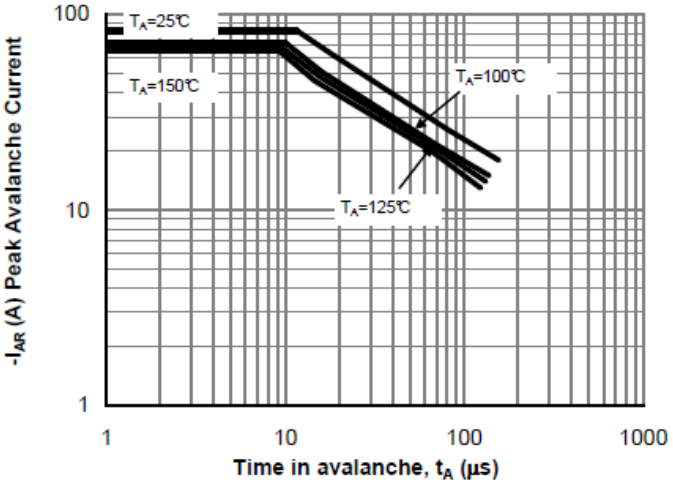


Figure 9: Single Pulse Avalanche capability (Note C)

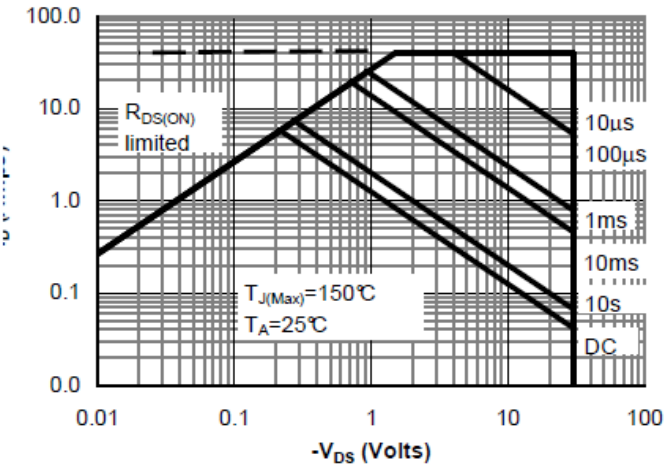


Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

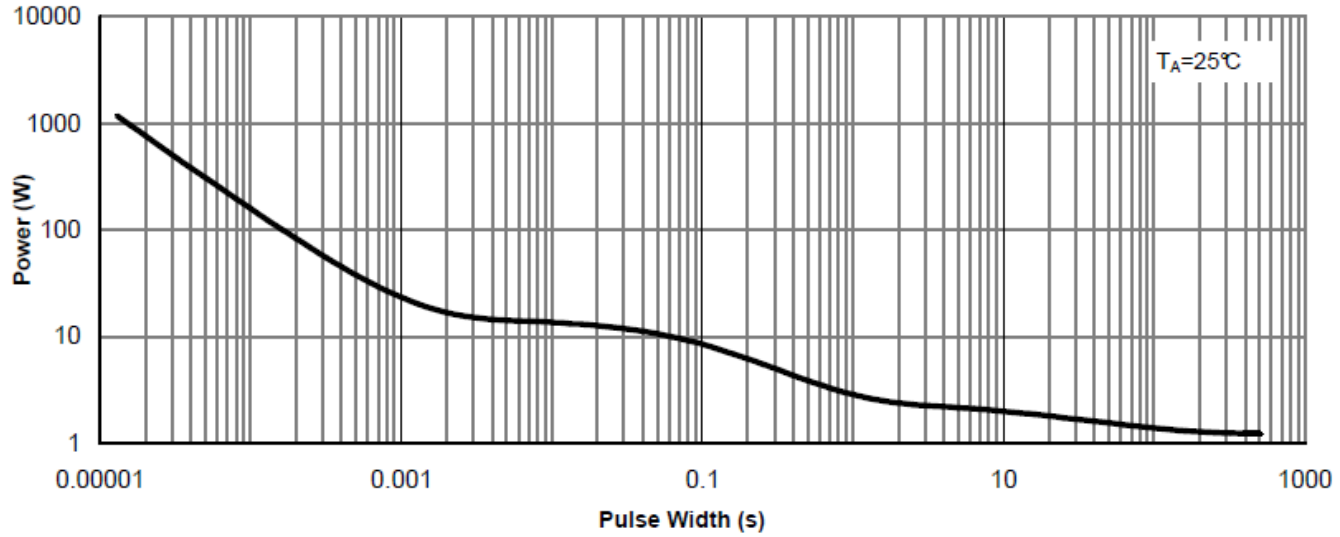


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

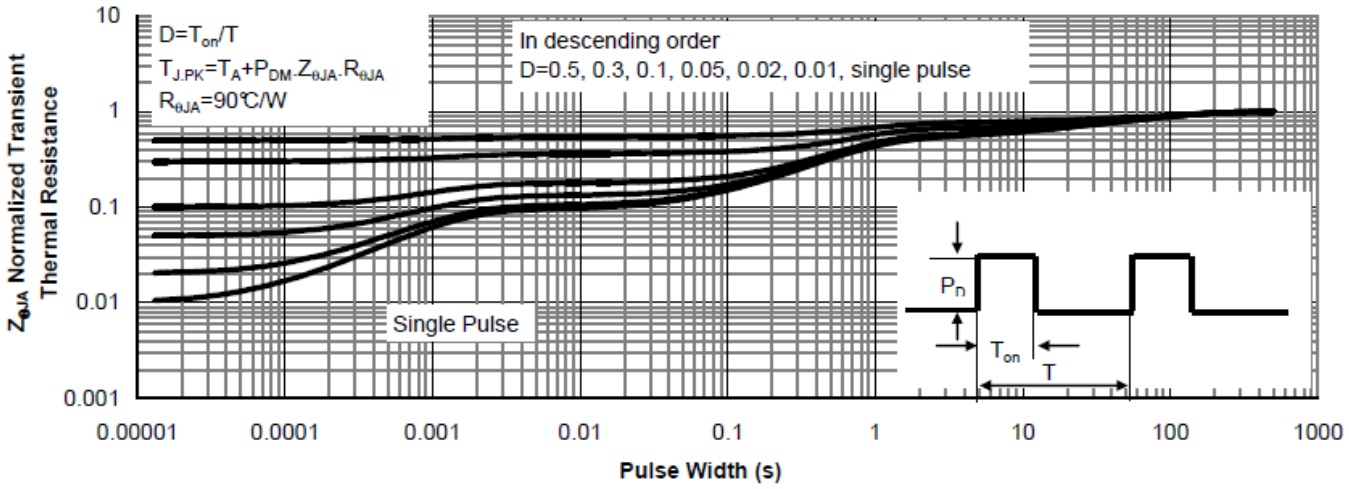
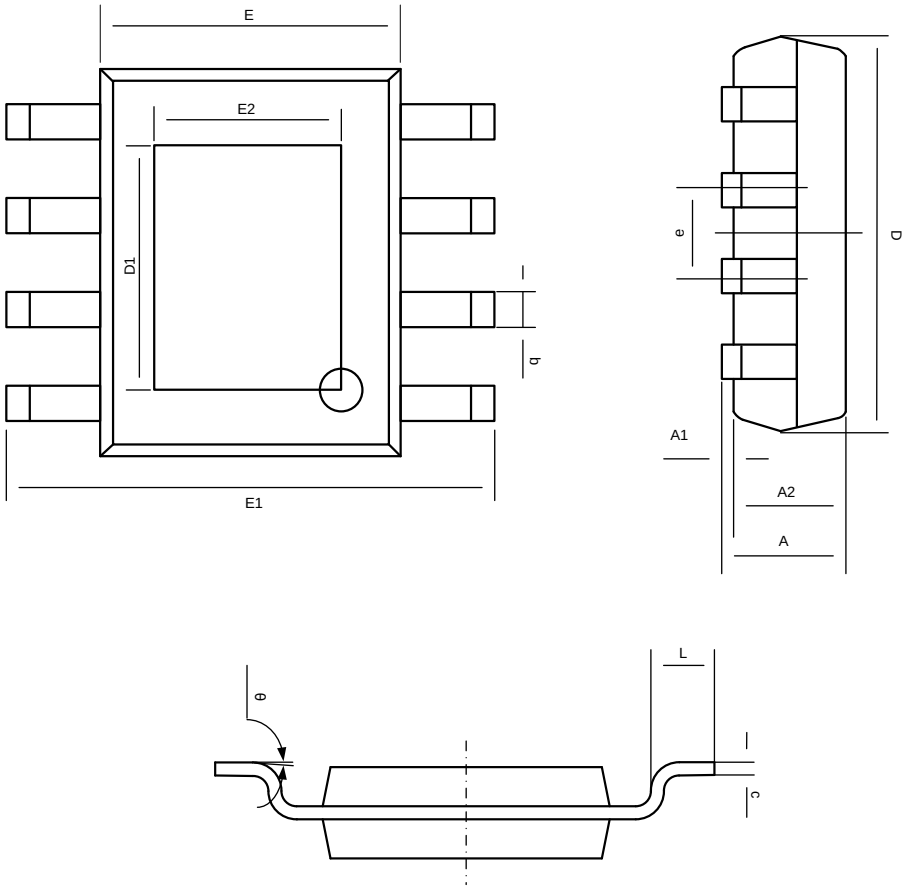


Figure 12: Normalized Maximum Transient Thermal Impedance (Note F)

Package Information

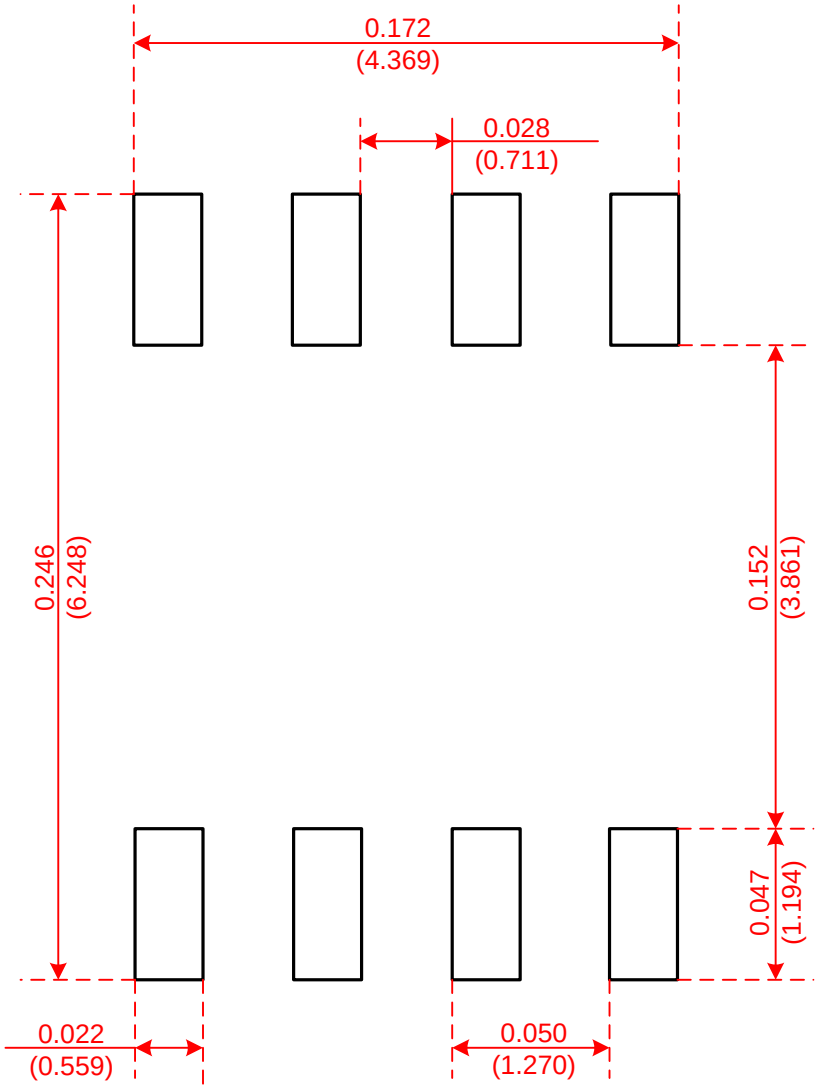
- **ESOP-8**



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

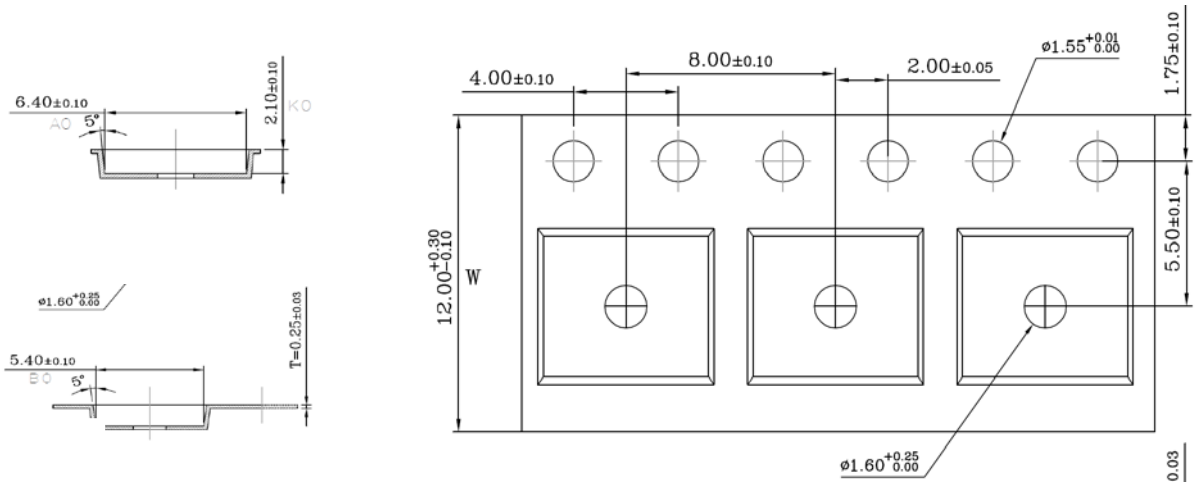
- **ESOP-8**

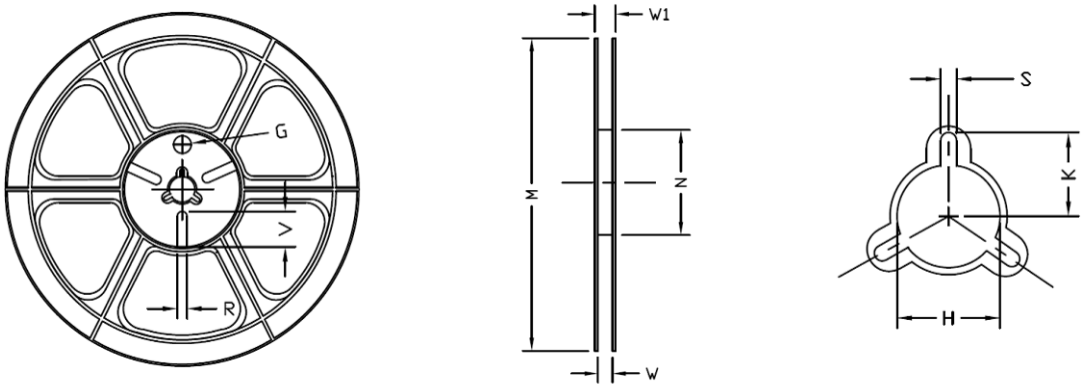


Recommended Minimum Pads
Dimensions in Inches/(mm)

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