

100V N-Channel Enhancement Mode MOSFET

Description

The PECN1007SR 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 Cr_{ss} .

General Features

- ◆ $V_{DS} = 100V$ $I_D = 7A$
 $R_{DS(ON)}(Typ.) = 37m\Omega$ @ $V_{GS} = 10V$
 $R_{DS(ON)}(Typ.) = 38m\Omega$ @ $V_{GS} = 4.5V$
- ◆ 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

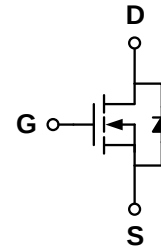
Package

- ◆ SOP-8

100% UIS TESTED!

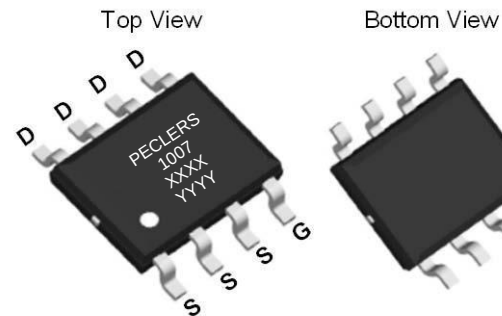
100% ΔV_{ds} TESTED!

Schematic diagram



Marking and pin assignment

SOP-8



XXXX—Date Code

YYYY—Quality Code



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN1007SR	-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}	100	V
Gate-source voltage		V_{GS}	±20	V
Continuous Drain Current	TC=25°C	I_D	7	A
	TC=100°C		6	
Pulsed Drain Current		I_{DP}	28	A
Avalanche energy(L=0.1mH)		E_{AS}	25	mJ
Maximum power dissipation	TC=25°C	P_D	2.5	W
Power Dissipation – Derate above 25°C	TC=25°C		2	
Operating junction Temperature range		T_j	-55—150	°C

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	100	-	-	V
BVDSS Temperature Coefficient	ΔBV _{DSS} /ΔT _J	Reference to 25℃,ID=1mA		60		mV/℃
Zero gate voltage drain current	I _{DSS}	V _{DS} =100V, V _{GS} =0V	-	-	1	μA
		T _J =85℃	-	-	30	
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	2	3.0	V
Drain-source on-state resistance ¹	R _{DS(ON)}	V _{GS} =10V, I _D =7A	-	37	42	mΩ
		V _{GS} =4.5V, I _D =5A		38	45	
On Status Drain Current	I _{D(ON)}	V _{DS} =5V, V _{GS} =10V	42	-	-	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		-	-	5	A
Reverse Recovery Time	t _{rr}	I _F =7A, dI/dt=500A/us	-	25	-	ns
Reverse Recovery Charge	Q _{rr}		-	130	-	nC
Dynamic Characteristics ²						
Gate Resistance	R _G	V _{GS} =0V, V _{DS} =0V,f=1MHz	-	0.75	-	Ω
Input capacitance	C _{ISS}	V _{GS} =0V ,V _{DS} =50V f=1.0MHz	-	1630	-	pF
Output capacitance	C _{OSS}		-	100	-	
Reverse transfer capacitance	C _{RSS}		-	50	-	
Turn-on delay time	t _{D(ON)}	V _{DD} =50V, I _D =1A, V _{GS} =10V, R _L =8.3Ω	-	7	-	ns
Turn-on Rise time	tr		-	7	-	
Turn-off delay time	t _{D(OFF)}		-	28	-	
Turn-off Fall time	tf		-	7	-	
Total gate charge	Q _g	V _{GS} =10V, I _D =4A,V _{DS} =50V	-	36		nC
Gate-source charge	Q _{gs}		-	5		

Thermal Characteristics

Parameter		Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient ^A	≤ 10s	$R_{\theta JA}$	33	40	°C/W
Maximum Junction-to-Ambient ^A	Steady-State		59	75	
Maximum Junction-to-Lead ^B	Steady-State	$R_{\theta JC}$	16	24	

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

B: The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ and lead to ambient.

Typical Performance Characteristics

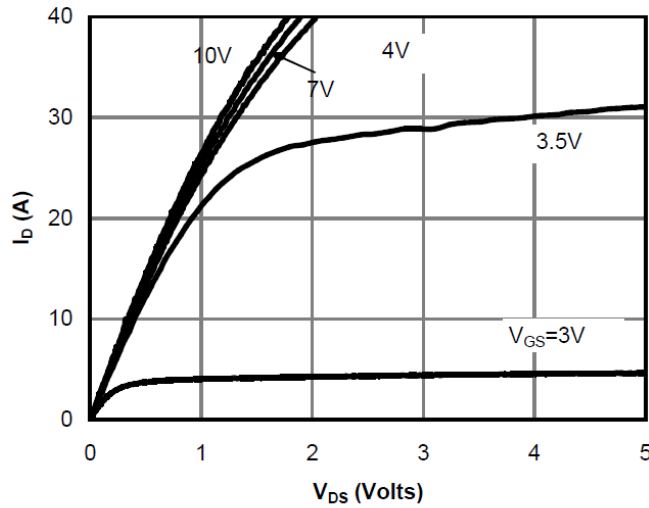


Fig 1: On-Region Characteristics

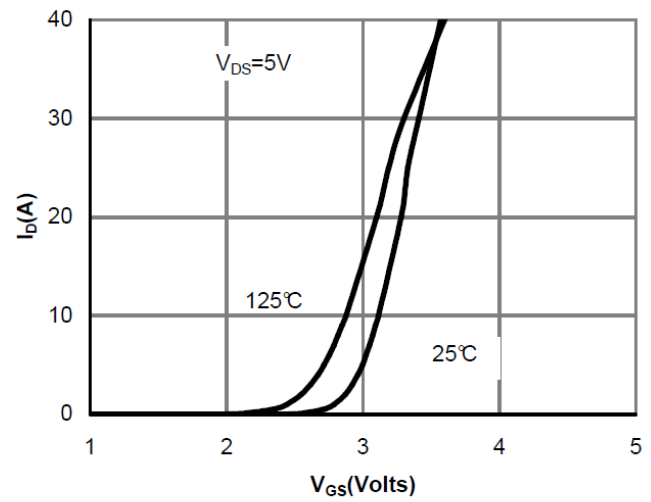


Figure 2: Transfer Characteristics

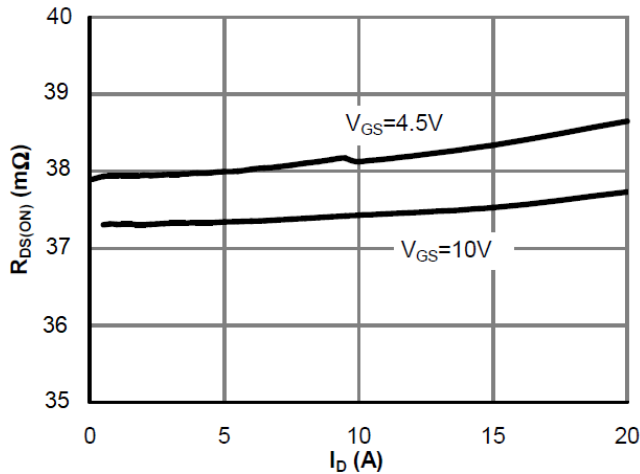


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

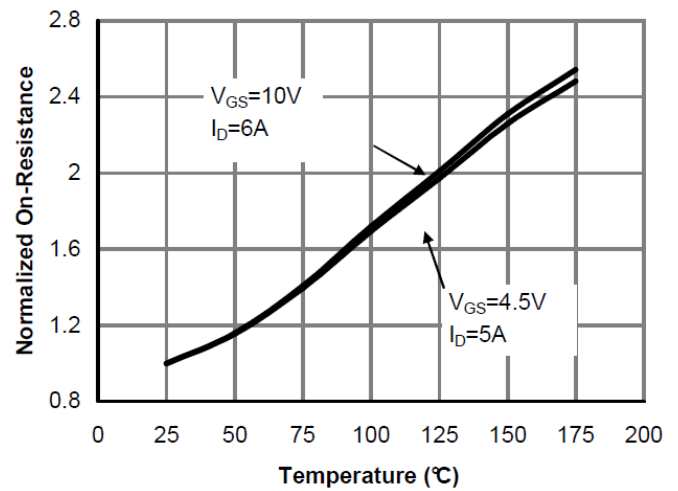


Figure 4: On-Resistance vs. Junction Temperature

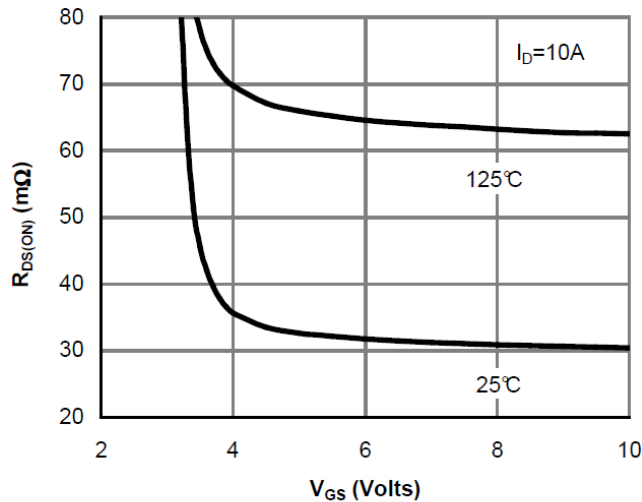


Figure 5: On-Resistance vs. Gate-Source Voltage

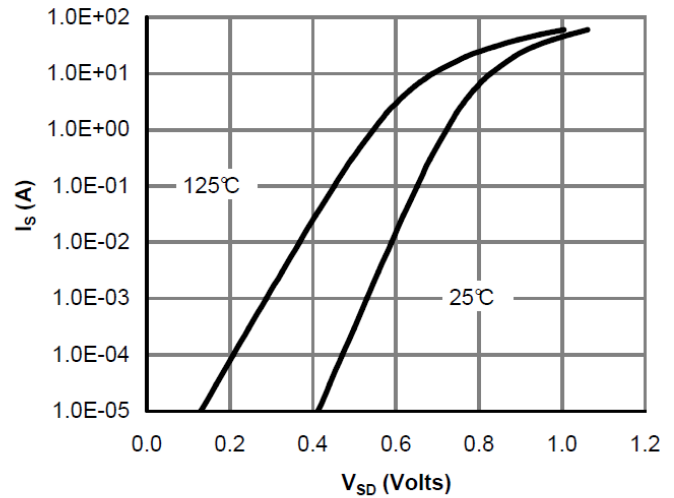
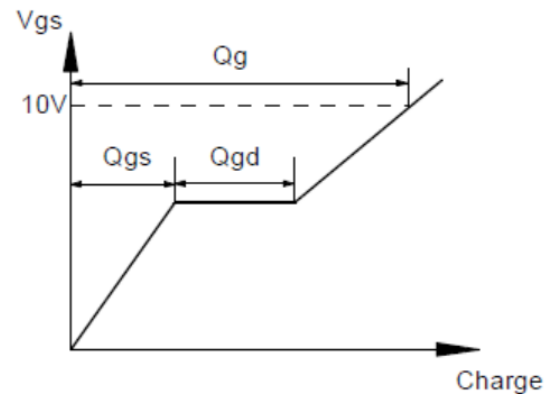
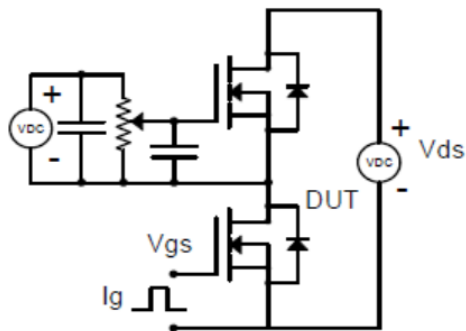
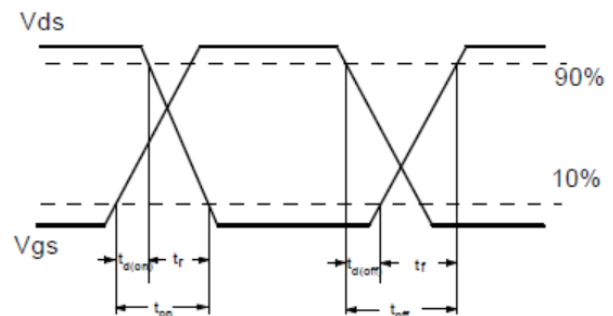
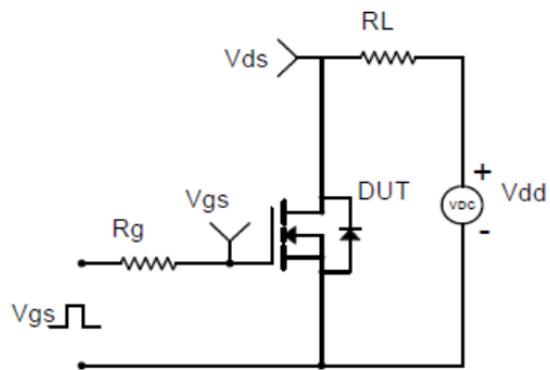


Figure 6: Body-Diode Characteristics

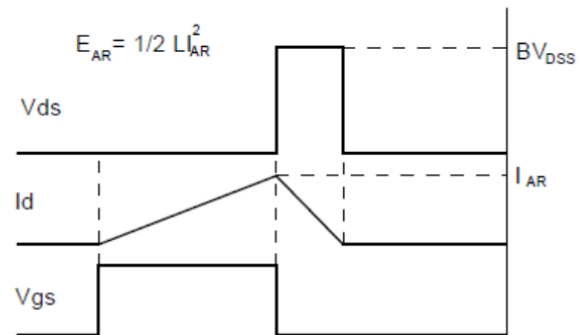
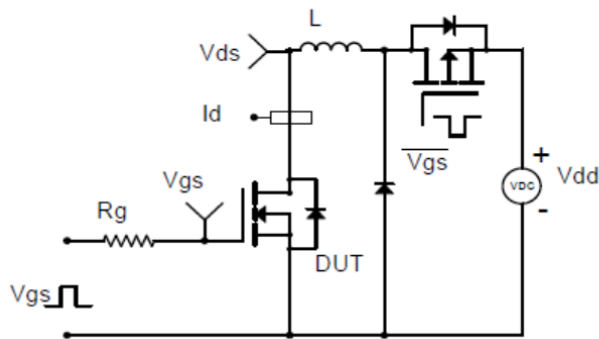
Gate Charge Test Circuit & Waveform



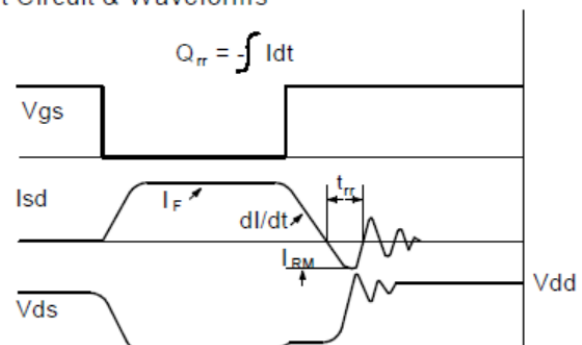
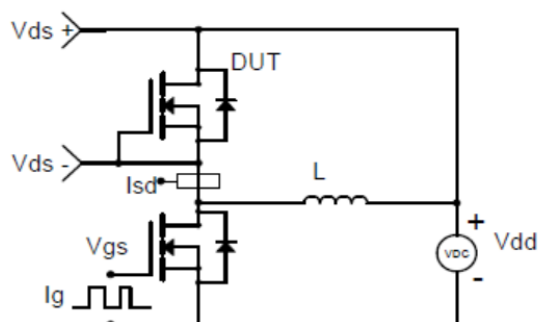
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

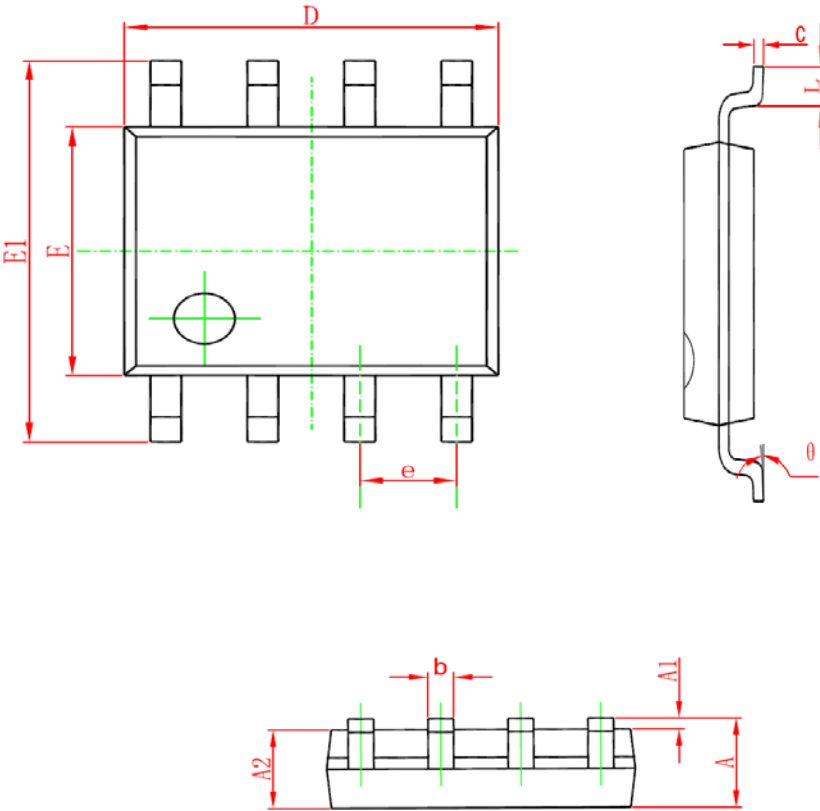


Diode Recovery Test Circuit & Waveforms



Package Information

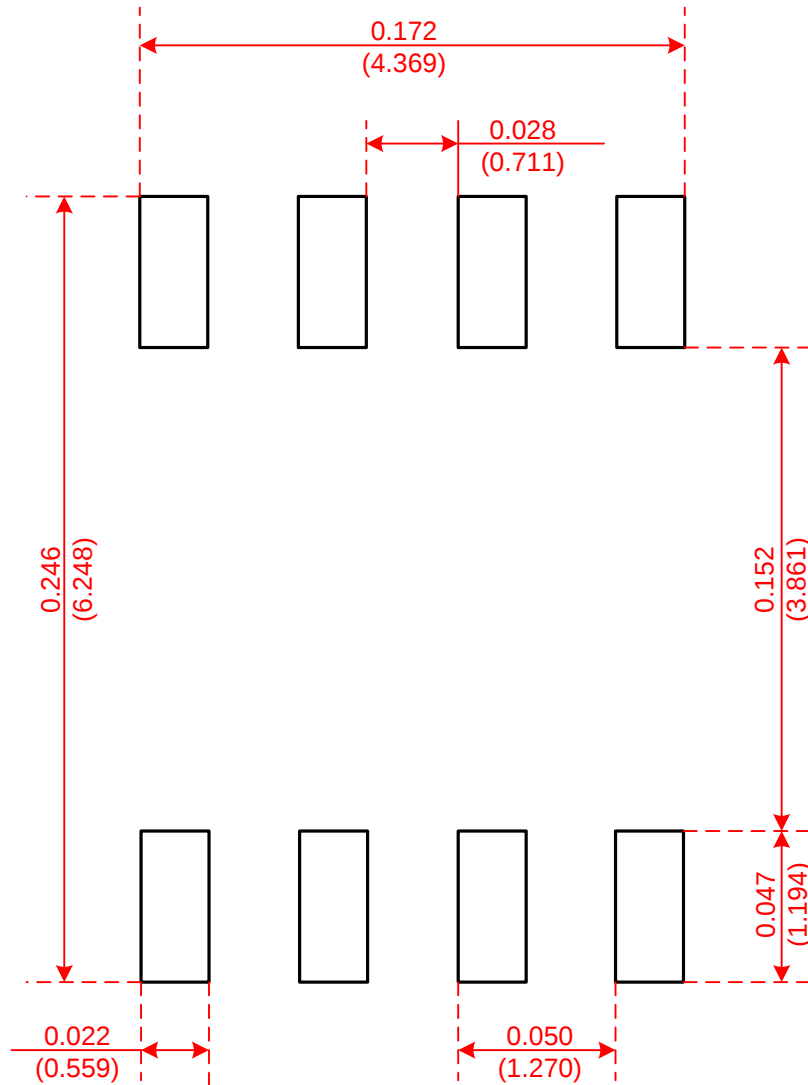
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Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	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

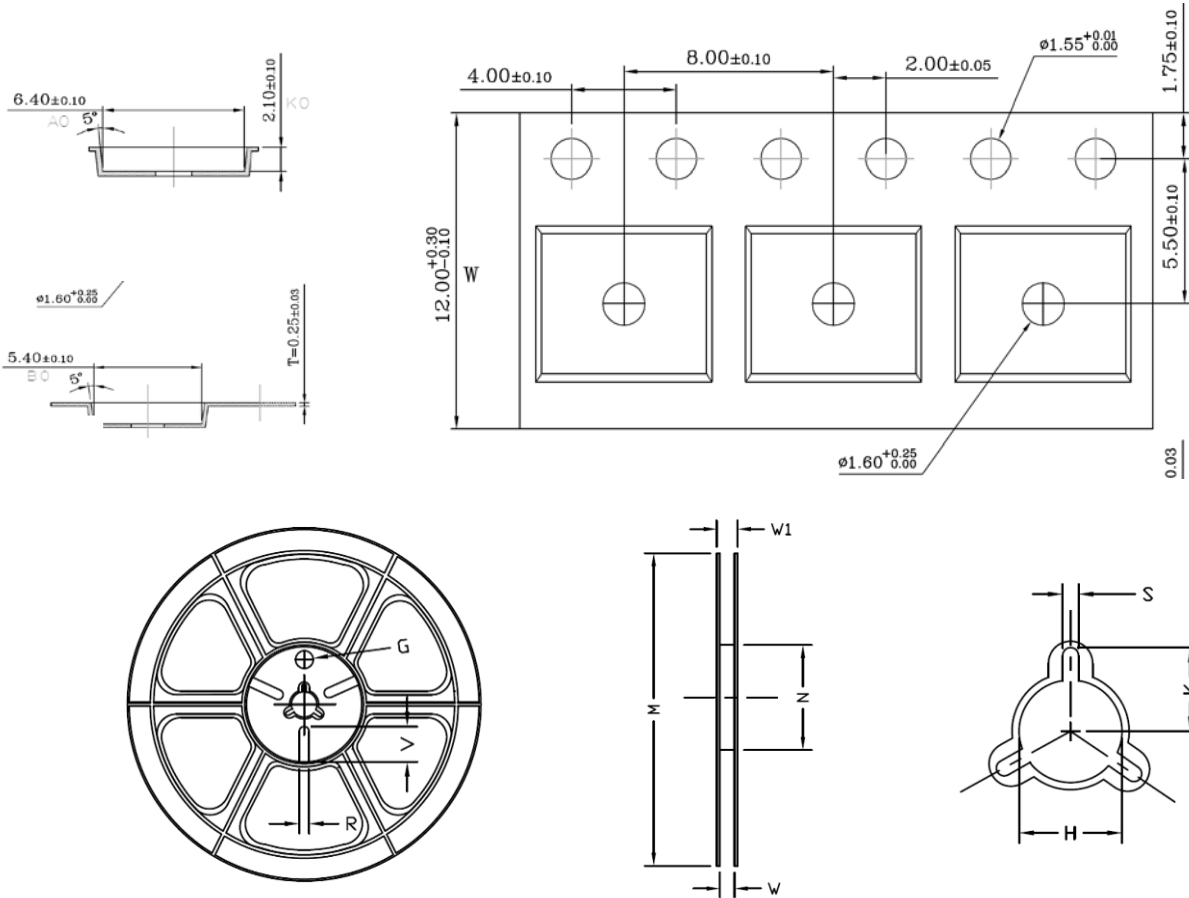
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Recommended Minimum Pads
Dimensions in Inches/(mm)

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	—	—	—

