

20V N And P-Channel Enhancement Mode MOSFET

Description

The PECN2623SR uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. The complementary MOSFETs may be used to form a level shifted high side switch, and for a host of other applications.

General Features

- ◆ **N-channel:**
 $V_{DS} = 20V, I_D = 6A$
 $R_{DS(ON)} = 21m\Omega$ (typical) @ $V_{GS} = 4.5V$
 $R_{DS(ON)} = 27m\Omega$ (typical) @ $V_{GS} = 2.5V$
- ◆ **P-Channel:**
 $V_{DS} = -20V, I_D = -5.5A$
 $R_{DS(ON)} = 38m\Omega$ (typical) @ $V_{GS} = -4.5V$
 $R_{DS(ON)} = 52m\Omega$ (typical) @ $V_{GS} = -2.5V$
- ◆ Excellent gate charge x $R_{DS(ON)}$ product(FOM)
- ◆ Very low on-resistance $R_{DS(ON)}$
- ◆ 150 °C operating temperature
- ◆ Pb-free lead plating
- ◆ 100% UIS tested

Application

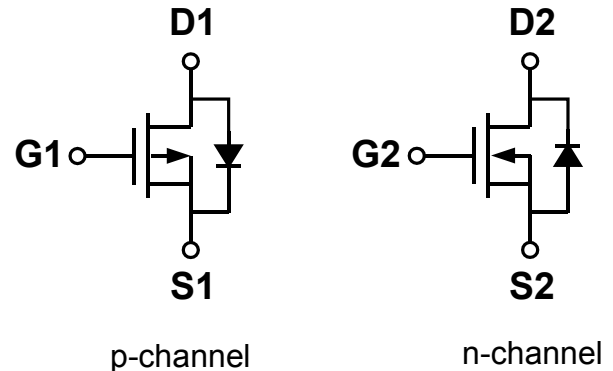
- ◆ DC/DC Converter
- ◆ Ideal for high-frequency switching and synchronous rectification

Package

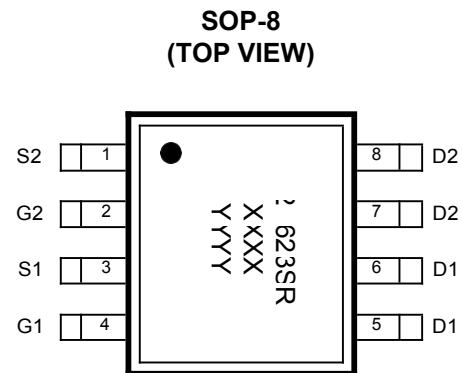
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100% UIS TESTED!
100% ΔV_{ds} TESTED!

Schematic diagram



Marking and pin assignment



Note:

XXXX is the date code

YYYY is the Quality Code.



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN2623SR-G	-55°C to +150°C	SOP-8	4000

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

Parameter	Symbol	Limit		Unit
		N	P	
Drain-source voltage	V_{DS}	20	-20	V
Gate-source voltage	V_{GS}	±12	±12	V

Maximum power dissipation		P_D	2.0	2.0	W
Operating junction Temperature range		T_j	-55—150	-55—150	°C
Drain Current-Continuous (Silicon Limited)	$T_A=25^\circ\text{C}$	I_D	6	-5.5	A
	$T_A=75^\circ\text{C}$		4	-4	
Pulsed Drain Current (Package Limited)		I_{DM}	24	-22	A
Power Dissipation ^B	$T_A=25^\circ\text{C}$	P_D	2	2	W
	$T_A=75^\circ\text{C}$		1.3	1.3	
Junction and Storage Temperature Range		T_J, T_{STG}	-55—150		°C

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 1 in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The value in any given application depends on the user's specific board design. The current rating is based on the $t \leq 10\text{s}$ thermal resistance rating.

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

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

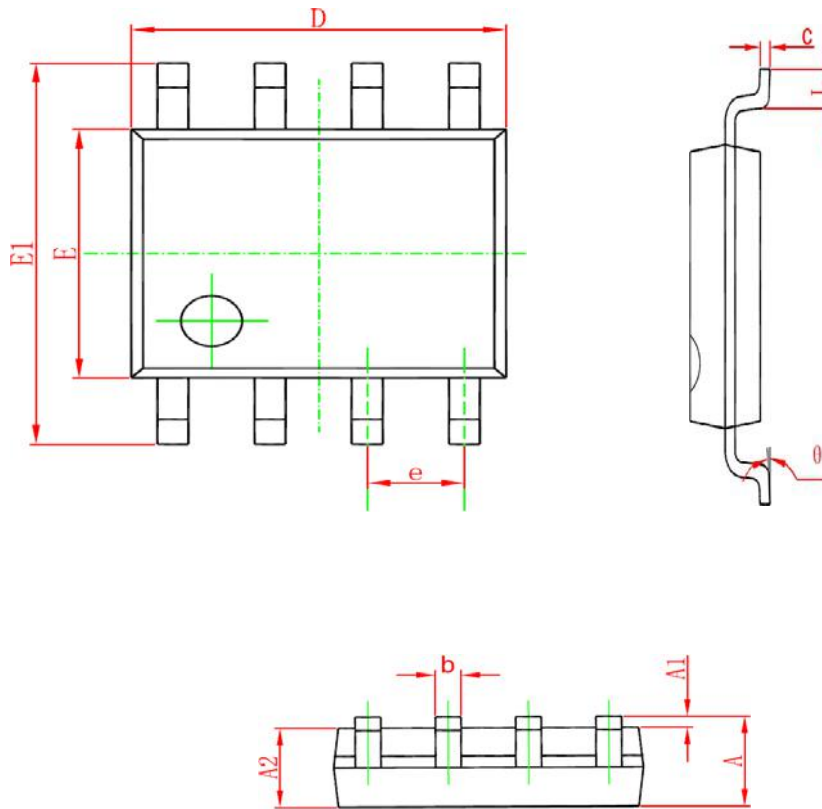
Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	20	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =20V, V _{GS} =0V	-	-	1	μA
Gate-body leakage	I _{GSS}	V _{DS} =0V, V _{GS} =±12V	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	05	0.65	1.2	V
Drain-source on-state resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =6A	-	21	25	mΩ
		V _{GS} =2.5V, I _D =5A	-	27	32	
Forward transconductance	gfs	V _{DS} =5V, I _D =6A	-	8	-	S
Dynamic Characteristics						
IPECNut capacitance	C _{ISS}	V _{DS} =10V, V _{GS} =0V f=1.0MHz	-	500	-	pF
Output capacitance	C _{OSS}		-	95	-	
Reverse transfer capacitance	C _{RSS}		-	75	-	
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1.0MHz	-	1.7	-	Ω
Switching Characteristics						
Turn-on delay time	t _{D(ON)}	V _{DS} =10V V _{GS} =4.5V R _L =2.5Ω R _{GEN} =3Ω	-	3.0	-	ns
Rise time	t _r		-	7.5	-	
Turn-off delay time	t _{D(OFF)}		-	20	-	
Fall time	t _f		-	6.0	-	
Total gate charge	Q _g	V _{DS} =10V, I _D =6A V _{GS} =4.5V	-	5.2	-	nC
Gate-source charge	Q _{gs}		-	2.5	-	
Gate-drain charge	Q _{gd}		-	1	-	

P-Channel Electrical Characteristics (T_J=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	-0.8	-1.2	V
Drain-source on-state resistance	R _{DS(ON)}	V _{GS} =-4.5V, I _D =-5.5A	-	38	50	mΩ
		V _{GS} =-4.5V, I _D =-4A	-	52	65	
Forward transconductance	gfs	V _{DS} =-5V, I _D =-5A	-	8.5	-	S
Dynamic Characteristics						
IPECNut capacitance	C _{ISS}	V _{DS} =-10V, V _{GS} =0V f=1.0MHz	-	760	-	pF
Output capacitance	C _{OSS}		-	290	-	
Reverse transfer capacitance	C _{RSS}		-	190	-	
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1.0MHz	-	1.8	-	Ω
Switching Characteristics						
Turn-on delay time	t _{D(ON)}	V _{DS} =-10V V _{GS} =-4.5V R _L =2.3Ω R _{GEN} =3Ω	-	11	-	ns
Rise time	t _r		-	30	-	
Turn-off delay time	t _{D(OFF)}		-	29	-	
Fall time	t _f		-	9	-	
Total gate charge	Q _g	V _{DS} =-10V, I _D =-5A V _{GS} =-4.5V	-	7.6	-	nC
Gate-source charge	Q _{gs}		-	1.2	-	
Gate-drain charge	Q _{gd}		-	1.6	-	

Package Information

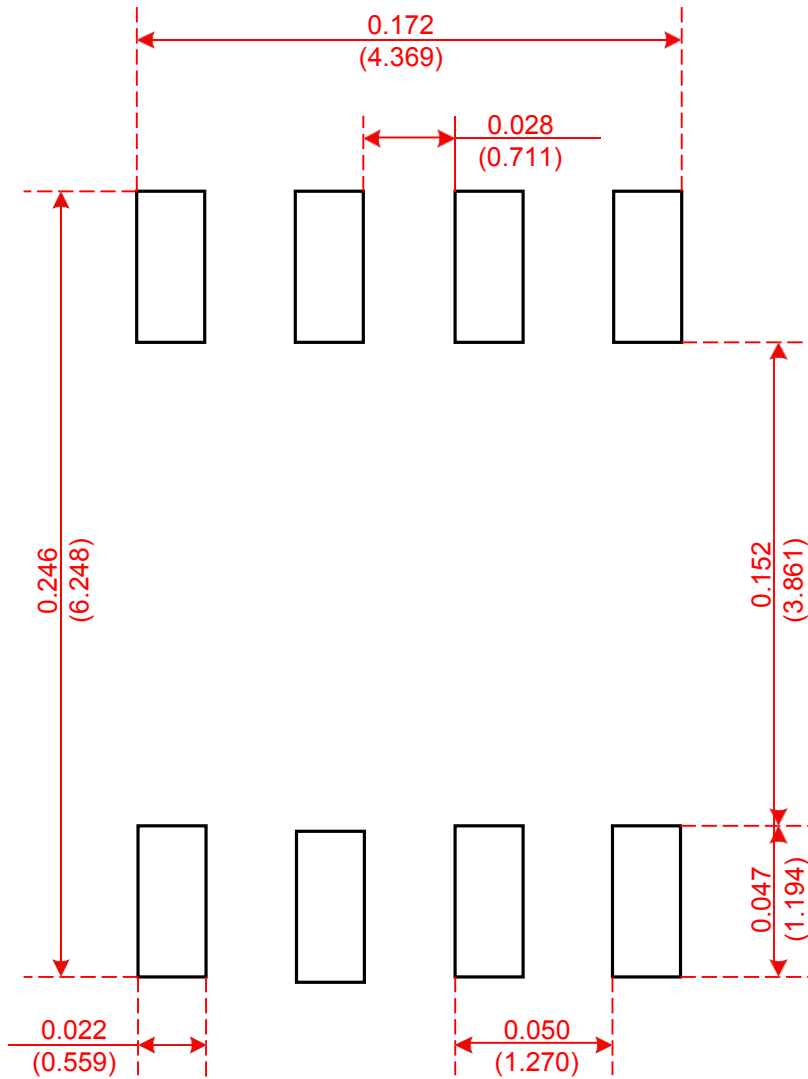
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Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150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

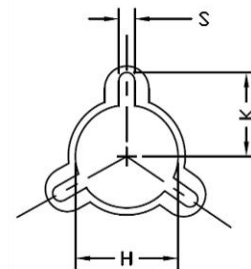
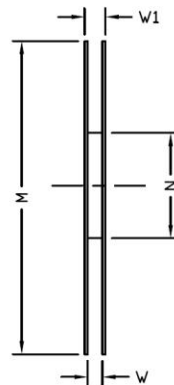
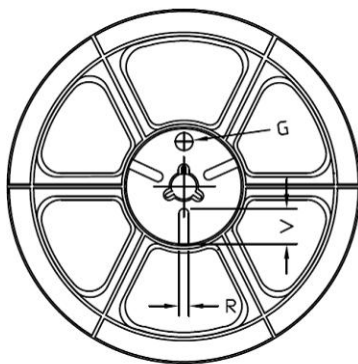
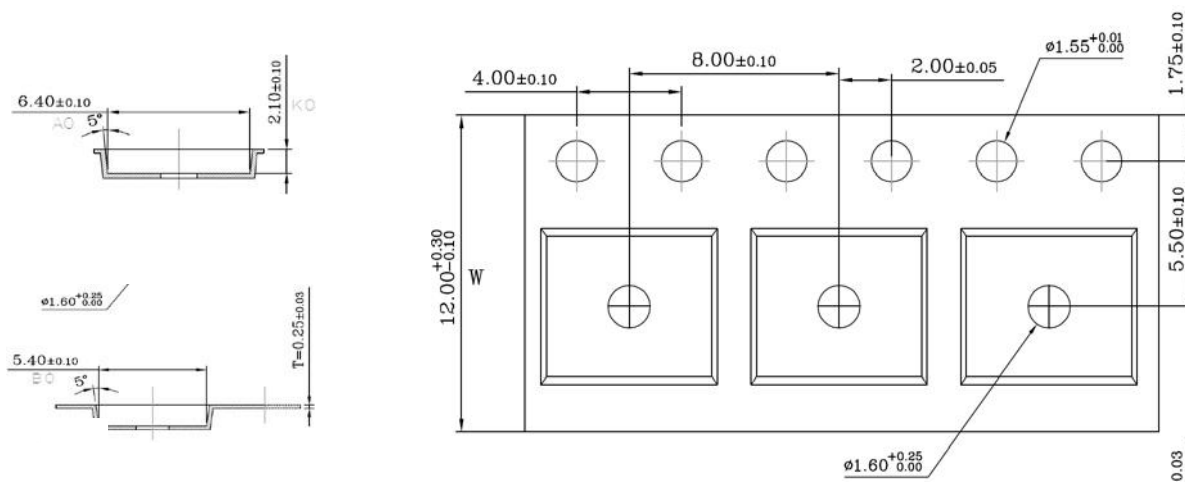
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Recommended Minimum Pads
Dimensions in Inches/(mm)

Tape and Reel

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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

