

Features

- Excellent Matching :
TPR82xxA: 0.05% Matching at -40°C to 125°C
TPR82xx: 0.1% Matching at -40°C to 125°C
- Matching Temperature Drift:
TPR82xxA : 1ppm/ $^{\circ}\text{C}$ (Max)
TPR82xx : 5ppm/ $^{\circ}\text{C}$ (Max)
- Operation Temperature Range: -40°C to 125°C

Applications

- Instrumentation
- Industrial Control
- Building Block for the Precision Amplifier Circuit
- Precision Divider for Voltage Reference

Description

The TPR82xx is a matched resistor network that consists of four matched resistors. The device has excellent matching specifications over the operating temperature range. Matching is specified by gain and CMRR.

All four resistors can be used independently, making the device the best choice for any application that can benefit from matched resistors. These resistor networks provide precise ratio metric stability required in difference amplifiers, instrumentation amplifiers, dividers, or inverters for voltage references.

The device is available in the EMSOP8 package.

Typical Application Circuit

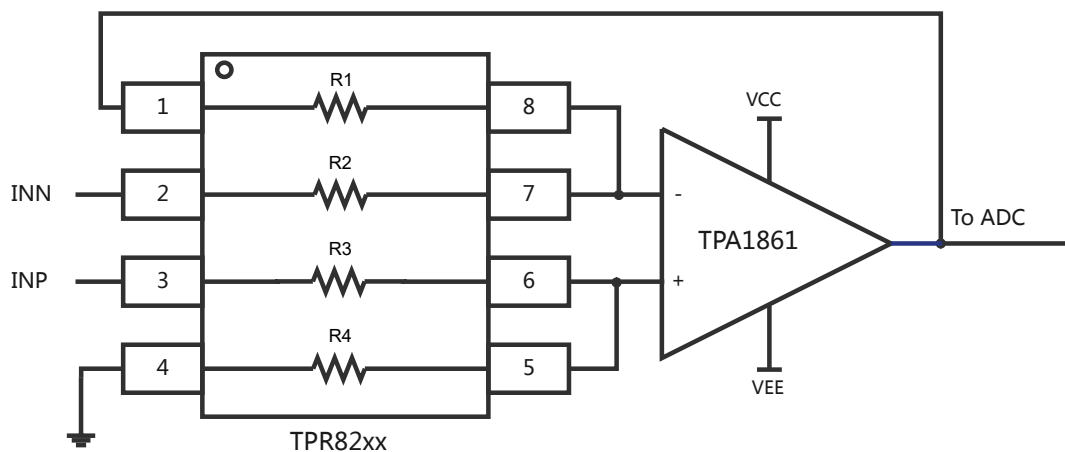


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Revision History

Date	Revision	Notes
2025-06-10	Rev.A.0	Initial version.

Pin Configuration and Functions

TPR82xx
EMSOP8 Package
Top View

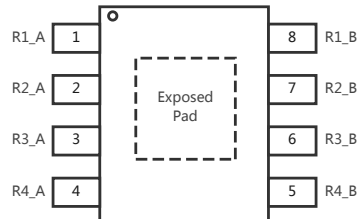


Table 1. Pin Functions: TPR82xx

Pin No.	Name	I/O	Description
1	R1A	IO	R1 Left Terminal
2	R2A	IO	R2 Left Terminal
3	R3A	IO	R3 Left Terminal
4	R4A	IO	R4 Left Terminal
5	R4B	IO	R4 Right Terminal
6	R3B	IO	R3 Right Terminal
7	R2B	IO	R2 Right Terminal
8	R1B	IO	R1 Right Terminal
	Exposed Pad		The underneath exposed pad for thermal enhancement. It can be left floating or connected to any voltage in the range of common-mode voltage.

Table 2. Resistor value options

Product	R2 = R3 Resistor Value(Ω)	R1 = R4 Resistor Value(Ω)	Resistor Ratio(R1/R2)
TPR8200	10k	10k	1
TPR8201	10k	8k	0.8
TPR8202	10k	4k	0.4
TPR8203	10k	2k	0.2
TPR8209	1k	300k	300
TPR8281	1200k	1000k	0.8333
TPR8282	1200k	600k	0.5
TPR8283	1200k	240k	0.2

Specifications

Absolute Maximum Ratings ⁽¹⁾

Parameter			Min	Max	Unit
Absolute Maximum Voltage	Across Any Resistors	TPR820x	-25	25	V
		TPR828x	-105	105	V
	Any PIN to EPAD		-205	205	V
T _J	Maximum Junction Temperature			150	°C
T _A	Operating Temperature Range		-40	125	°C
T _{STG}	Storage Temperature Range		-65	150	°C
T _L	Lead Temperature (Soldering 10 sec)			260	°C

(1) Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. Exposure to any Absolute Maximum Rating condition for extended periods may affect device reliability and lifetime.

ESD, Electrostatic Discharge Protection

Symbol	Parameter	Condition	Minimum Level	Unit
HBM	Human Body Model ESD	ANSI/ESDA/JEDEC JS-001 ⁽¹⁾	500	V
CDM	Charged Device Model ESD	ANSI/ESDA/JEDEC JS-002 ⁽²⁾	1	kV

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.

(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

Thermal Information

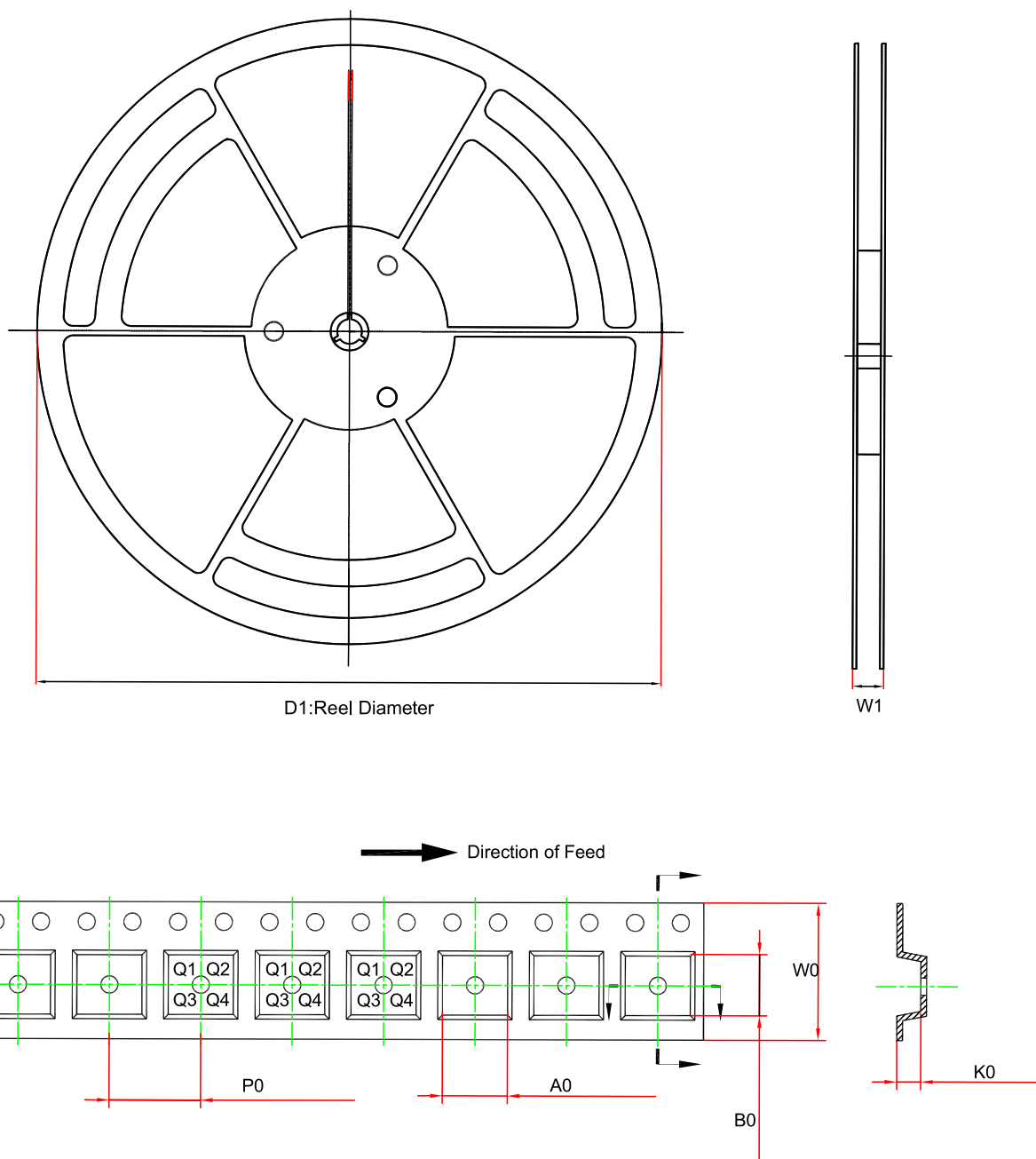
Package Type	θ_{JA}	θ_{JC}	Unit
EMSOP8	50	25	°C/W

Electrical Characteristics

All test conditions: $T_A = 25^\circ\text{C}$, unless otherwise noted.

Parameter		Conditions	T_A	Min	Typ	Max	Unit
VCM	Common-mode Voltage	Voltage between any pin to EPAD		-200		200	V
V	Working Voltage	TPR820x Across any two resistors		-20		20	V
		TPR828x Across any two resistors		-100		100	V
$\Delta R/R$	Resistor Matching Ratio	TPR82xx	-40°C to 125°C	-0.1		0.1	%
		TPR820xA	-40°C to 125°C	-0.05		0.05	%
$(\Delta R/R)/\Delta T$	Resistor Matching Ratio Temperature Drift	TPR82xx	-40°C to 125°C	-5	± 1	5	ppm/ $^\circ\text{C}$
		TPR820xA	-40°C to 125°C	-1	± 0.2	1	ppm/ $^\circ\text{C}$
$(\Delta R/R)_{\text{CMRR}}$	Matching for CMRR = $1/2 * (R2/R1 - R3/R4) * (R1/R2)$	TPR82xx	-40°C to 125°C	-0.04		0.04	%
		TPR820xA	-40°C to 125°C	-0.025		0.025	%
ΔR	Absolute Resistor Tolerance		-40°C to 125°C	-15		15	%
$\Delta R/\Delta T$	Absolute Resistor Value Temperature Drift		-40°C to 125°C	-20	± 5	20	ppm/ $^\circ\text{C}$

Tape and Reel Information

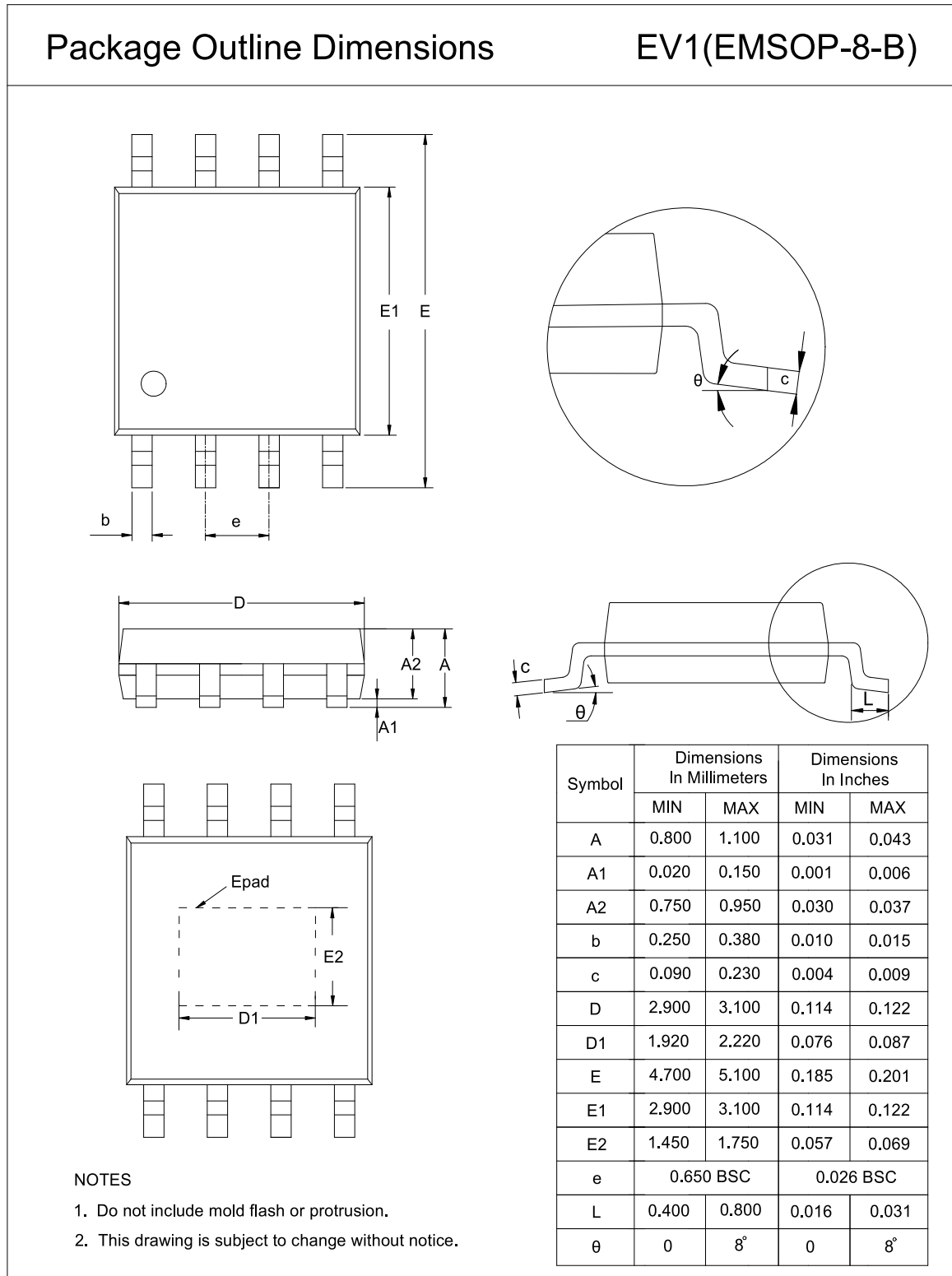


Order Number	Package	D1 (mm)	W1 (mm)	A0 (mm) ⁽¹⁾	B0 (mm) ⁽¹⁾	K0 (mm) ⁽¹⁾	P0 (mm)	W0 (mm)	Pin1 Quadrant
TPR82xx-EV1R	EMSOP8	330.0	17.6	5.25	3.25	1.25	8.0	12.0	Q1
TPR82xx-EV1R-S	EMSOP8	330.0	17.6	5.25	3.25	1.25	8.0	12.0	Q1

(1) The value is for reference only. Contact the 3PEAK factory for more information.

Package Outline Dimensions

EMSOP8



Order Information

Order Number	Operating Temperature Range	Package	Marking Information	MSL	Transport Media, Quantity	Eco Plan
TPR8200-EV1R	-40 to 125°C	EMSOP8	R8601	3	Tape and Reel, 3000	Green
TPR8200A-EV1R	-40 to 125°C	EMSOP8	R8601	3	Tape and Reel, 3000	Green
TPR8201-EV1R-S ⁽¹⁾	-40 to 125°C	EMSOP8	R8201	3	Tape and Reel, 3000	Green
TPR8201A-EV1R-S	-40 to 125°C	EMSOP8	R8201	3	Tape and Reel, 3000	Green
TPR8202-EV1R-S	-40 to 125°C	EMSOP8	R8202	3	Tape and Reel, 3000	Green
TPR8202A-EV1R-S	-40 to 125°C	EMSOP8	R8202	3	Tape and Reel, 3000	Green
TPR8203-EV1R-S	-40 to 125°C	EMSOP8	R8203	3	Tape and Reel, 3000	Green
TPR8203A-EV1R-S	-40 to 125°C	EMSOP8	R8203	3	Tape and Reel, 3000	Green
TPR8209-EV1R-S	-40 to 125°C	EMSOP8	R8209	3	Tape and Reel, 3000	Green
TPR8281-EV1R-S	-40 to 125°C	EMSOP8	R8281	3	Tape and Reel, 3000	Green
TPR8282-EV1R-S	-40 to 125°C	EMSOP8	R8282	3	Tape and Reel, 3000	Green
TPR8283-EV1R-S	-40 to 125°C	EMSOP8	R8283	3	Tape and Reel, 3000	Green

(1) The reflow process is validated for the order number with "-S" suffix.

Green: 3PEAK defines "Green" to mean RoHS compatible and free of halogen substances.

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