Features

- Excellent Matching
- TPR860xA: 0.01% Matching at −40°C to 125°C
- TPR8600, TPR8601, TPR8602: 0.025% Matching at −40°C to 125°C
- TPR8603: 0.03% Matching at −40°C to 125°C
- Matching Temperature Drift: 0.2ppm/°C
- Operating Voltage: ±60 V
- Operation Temperature Range: −40°C to 125°C

Applications

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

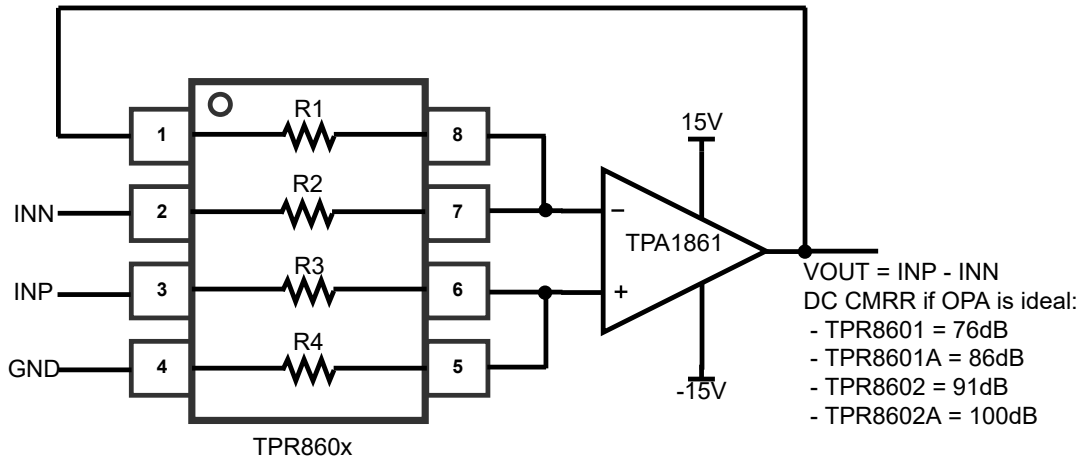
Description

The TPR860x is a matched resistor network which 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 a best choice for any application that can benefit from matched resistors. These resistor networks provide precise ratiometric stability required in difference amplifiers, instrumentation amplifiers, divider or inverter for voltage references.

The device is available in a 8-pin MSOP package.

Typical Application Circuit



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Revision History

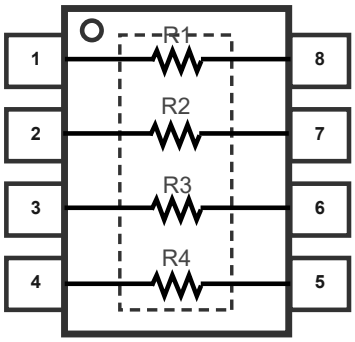
Date	Revision	Notes
2022-05-20	Rev.A.0	Initial Version
2023-08-17	Rev.A.1	Added part number: TPR8600-EV1R. Updated status of part number to released: TPR8602-EV1R, TPR8603-EV1R. Updated specification of TPR8603-EV1R.
2023-09-29	Rev.A.2	Added part number: TPR8600-EV1R-S, TPR8601-EV1R-S, TPR8601A-EV1R-S, TPR8602-EV1R-S. Added typical values in Electrical Characteristics.

Pin Configuration and Functions

TPR860x

MSOP8 Package

Top View



The E-PAD can be left floating or connected to any voltage in the range of working voltage.

Product	A Group, R2 = R3 (kΩ)	B Group, R1 = R4 (kΩ)	Resistor Ratio
TPR8600-EV1R	10	10	1
TPR8601-EV1R, TPR8601A-EV1R	10	10	1
TPR8602-EV1R, TPR8602A-EV1R	10	100	10
TPR8603-EV1R	300	300	1

Specifications

Absolute Maximum Ratings (1)

Parameter		Min	Max	Unit
	Total Voltage Across Any Two Pins (2)	−80	80	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.
(2) The instantaneous difference voltage applied to any other pin should not exceed the Absolute Maximum Rating. This includes the voltage across any resistor, the voltage across any two unrelated pins, and the voltage across any pin with respect to the exposed pad of the package.

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	60	20	°C/W

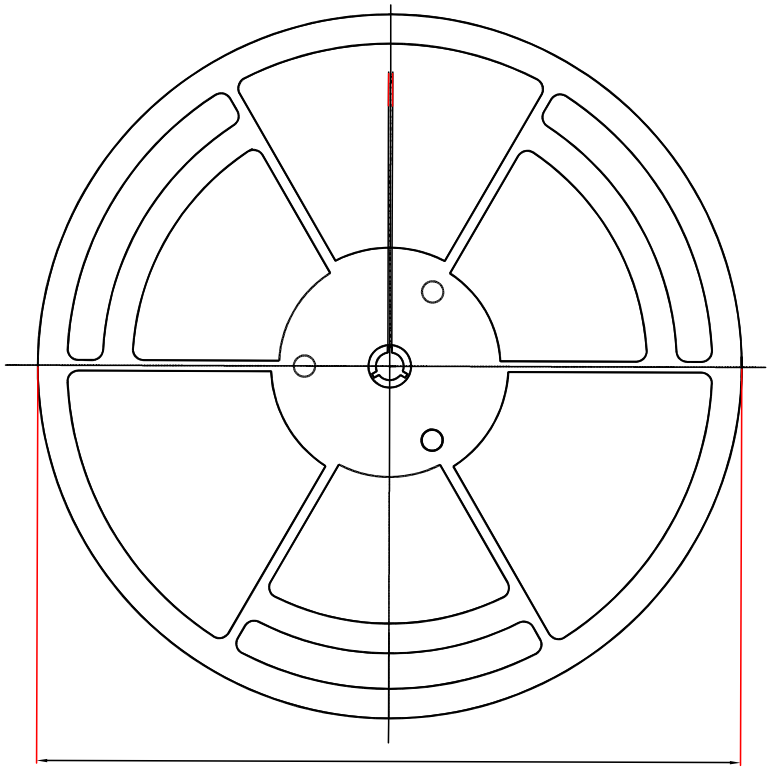
Electrical Characteristics

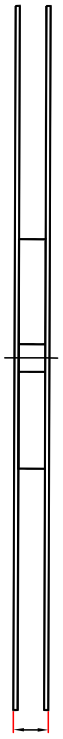
All test condition is T_A= 25°C, unless otherwise noted.

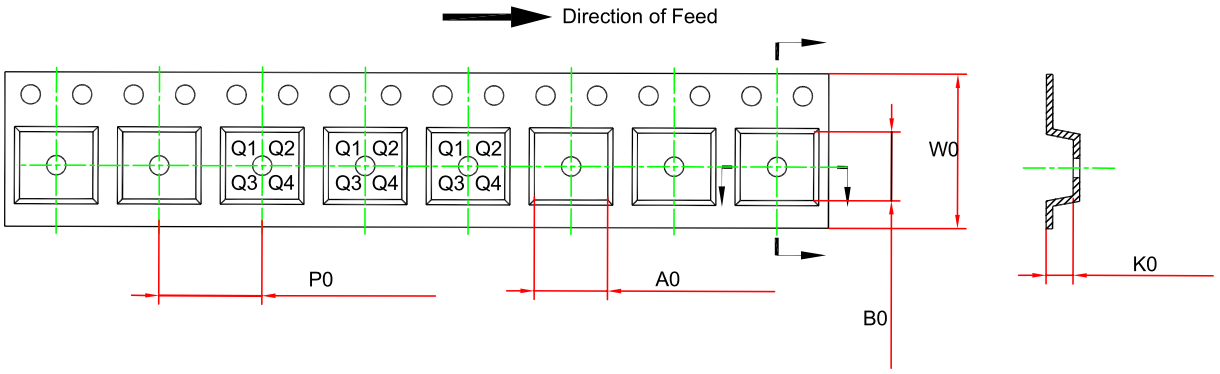
Parameter		Conditions	T_A	Min	Typ	Max	Unit
	电阻工作电压 Working Voltage					60	V
ΔR/R	电阻匹配比例 Resistor Matching Ratio	TPR8600 TPR8601 TPR8602	–40°C to 125°C	–0.025	0.005	+0.025	%
		TPR8603	–40°C to 125°C	–0.03	0.005	+0.03	%
		TPR8601A		–0.01	0.005	+0.01	%
			–40°C to 125°C	–0.0125		+0.0125	%
(ΔR/R)/ΔT	电阻匹配比例随温度的漂移 Resistor Matching Ratio Temperature Drift(1)		–40°C to 125°C		0.1	1	ppm/°C
	影响共模抑制比的电阻匹配度 Matching for CMRR = 1/2 * (R2/R1-R3/R4) * (R1/R2)	TPR8600 TPR8601 TPR8602	–40°C to 125°C	–0.015	0.0001	+0.015	%
		TPR8603	–40°C to 125°C	–0.02	0.0001	+0.02	%
		TPR8601A	–40°C to 125°C	–0.005	0.0001	+0.005	%
ΔR	绝对电阻精度 Absolute Resistor Tolerance		–40°C to 125°C	–15	2	15	%
ΔR/ΔT	绝对电阻阻值随温度的漂移 Absolute Resistor Value Temperature Drift (1)		–40°C to 125°C	–20	5	20	ppm/°C

(1) Provided by bench test and design simulation.

Tape and Reel Information





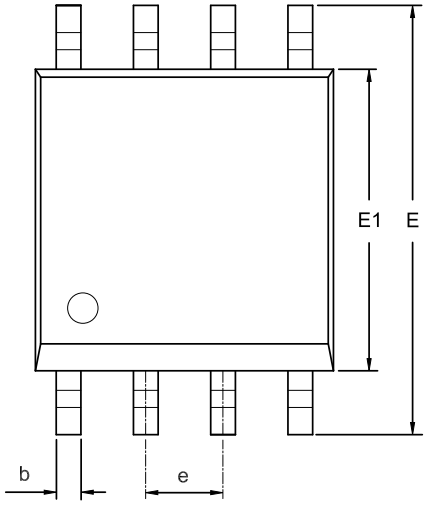


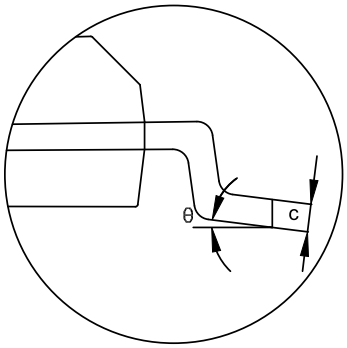
Order Number	Package	D1 (mm)	W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	W0 (mm)	Pin1 Quadrant
TPR860x-EV1R	EMSOP8	330.0	17.6	5.3	3.3	1.3	8.0	12.0	Q1

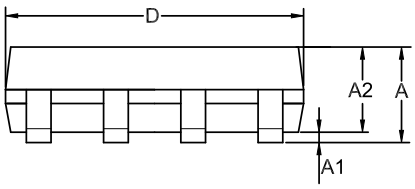
Package Outline Dimensions

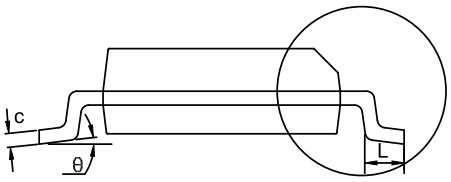
EMSOP8

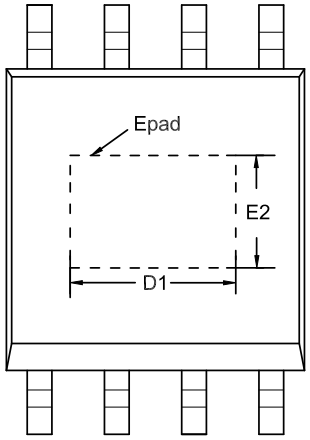
Package Outline Dimensions EV1(EMSOP-8-B)











Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.800	1.100	0.031	0.043
A1	0.050	0.150	0.002	0.006
A2	0.750	0.950	0.030	0.037
b	0.250	0.380	0.010	0.015
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
D1	1.920	2.220	0.076	0.087
E	4.700	5.100	0.185	0.201
E1	2.900	3.100	0.114	0.122
E2	1.450	1.750	0.057	0.069
e	0.650 BSC		0.026 BSC	
L	0.400	0.800	0.016	0.031
θ	0	8°	0	8°

NOTES

1. Do not include mold flash or protrusion.
2. This drawing is subject to change without notice.

Order Information

Order Number	Operating Temperature Range	Package	Marking Information	MSL	Transport Media, Quantity	Eco Plan
TPR8600-EV1R	−40 to 125°C	EMSOP8	R8600	3	Tape and Reel, 3000	Green
TPR8600-EV1R-S(1)(3)	−40 to 125°C	EMSOP8	R8600	3	Tape and Reel, 3000	Green
TPR8601-EV1R	−40 to 125°C	EMSOP8	R8601	3	Tape and Reel, 3000	Green
TPR8601-EV1R-S(1)(3)	−40 to 125°C	EMSOP8	R8601	3	Tape and Reel, 3000	Green
TPR8601A-EV1R	−40 to 125°C	EMSOP8	R8601	3	Tape and Reel, 3000	Green
TPR8601A-EV1R-S(1)(3)	−40 to 125°C	EMSOP8	R8601	3	Tape and Reel, 3000	Green
TPR8602-EV1R	−40 to 125°C	EMSOP8	R8602	3	Tape and Reel, 3000	Green
TPR8602-EV1R-S(2)	−40 to 125°C	EMSOP8	R8602	3	Tape and Reel, 3000	Green
TPR8602A-EV1R (2)	−40 to 125°C	EMSOP8	R8602	3	Tape and Reel, 3000	Green
TPR8603-EV1R	−40 to 125°C	EMSOP8	R8303	3	Tape and Reel, 3000	Green

(1) Samples can be provided in 2 months.
(2) For future product, contact the 3PEAK factory for more information and samples.
(3) Reflow process is validated for order number with "-S" suffix.

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

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