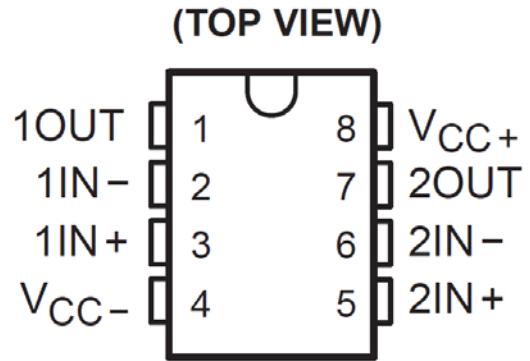


Summary

TL082 is a dual operational amplifier with high-speed J-FET input, which consists of high-voltage J-FET and bipolar transistor. It has high conversion rate, low input bias current and offset current, and low temperature coefficient of offset voltage. The working range is 0°C-70°C.

TL082 is available in SOP8 packages.

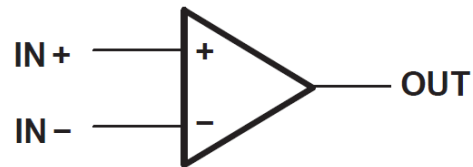
Pin diagram



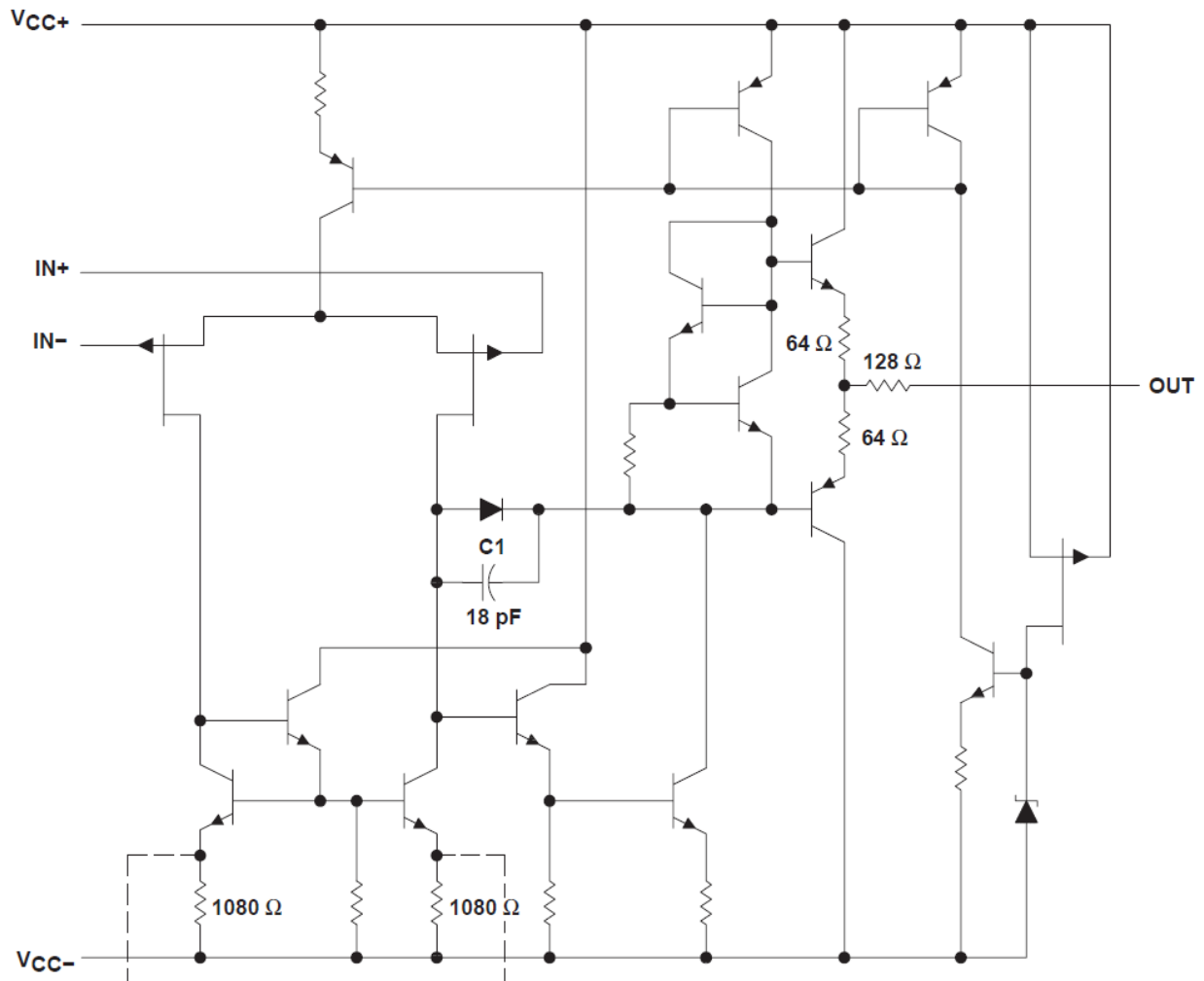
Main feature

- Lower power consumption
- Wide common - mode and differential - mode input voltage range
- Low input bias current and offset current
- Output short - circuit current protection
- High input impedance
- High conversion rate
- High gain bandwidth product, up to 4MHz

Symbol (each operational amplifier)



Internal block diagram (each operational amplifier)



Limit parameter

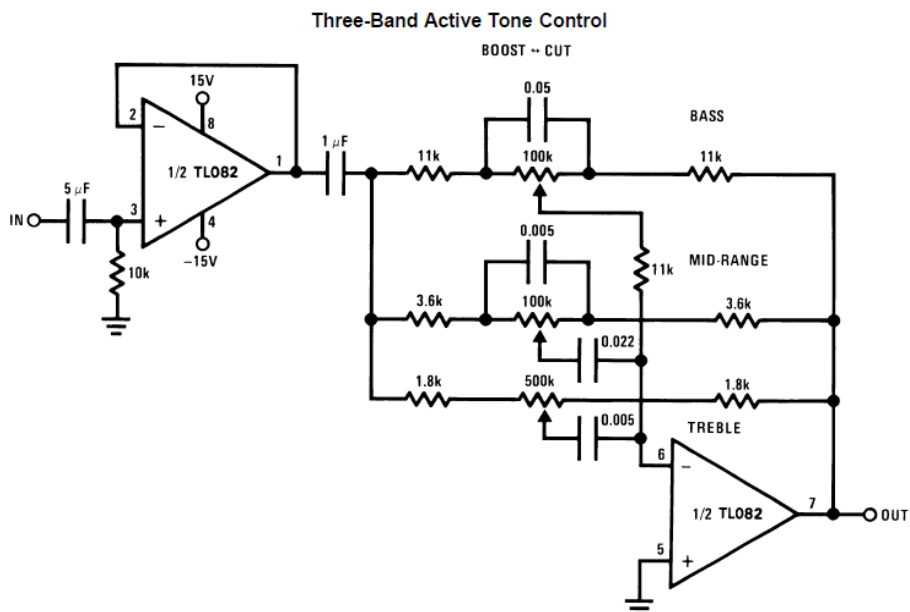
symbol	describe	limit value	unit
Vcc	Power supply voltage	±18	V
Vi	input voltage	±14	V
Vid	Differential mode input power	±28	V
Toper	Working temperature	0—70	°C
Tstg	Storage temperature	-65—150	°C

Electrical characteristics (VCC = ±15, T_{amp} = 25°C shall be specified separately)

symbol	Parameter name	test condition	test value			unit
			Min	Typ	Max	
V _{io}	offset voltage	V _o =0V		3	6	mV
I _{io}	Input offset current	V _o =0V			1.5	nA
I _{ib}	Output bias current	V _o =0V			2.5	nA
V _{icr}	Input common mode voltage		-12	±11	15	V
V _{om}	Peak output voltage	RL = 10 kΩ RL ≥ 2 kΩ	±12 ±10	±13.5 ±12.5		V
AVD	Large signal voltage gain	RL ≥ 2 kΩ VO = ±10 V	80	95		dB
B1	Gain bandwidth product			3		MHz
CMRR	common mode rejection ratio		70	85		dB
kSVR	Power supply rejection ratio	VCC= ±15 V to ±9 V V _o =0V	70	86		dB
ICC	Static current- per channel			1.4	2.8	mA
SR	conversion rate	V _I = 10 V,	8	13		V/us
t _r	risetime			0.05		us

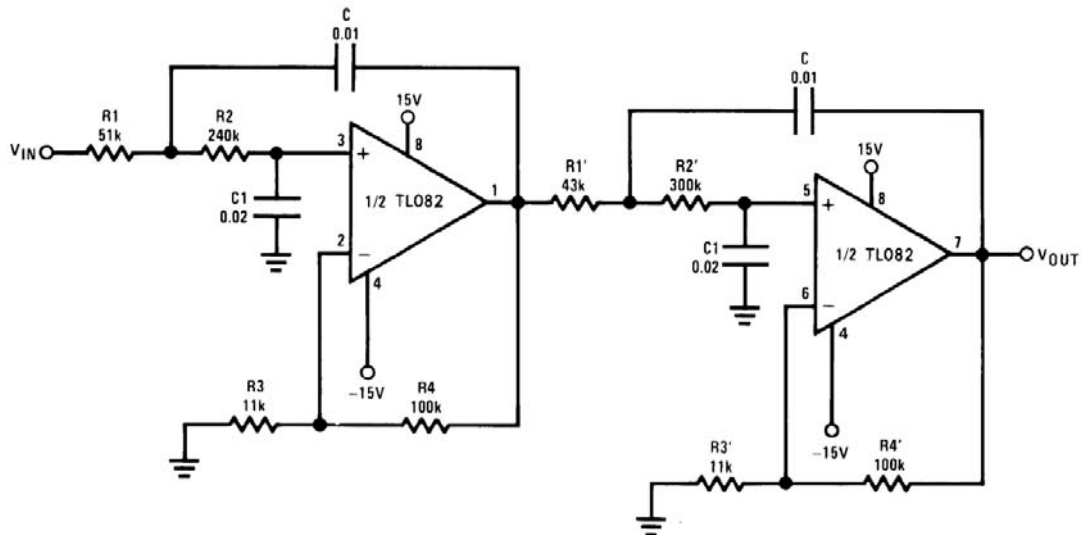
Typical application circuit diagram (including one operational amplifier)

Three - Band Active Tone Control for three- segment tone control.



Fourth-order low-pass filtering

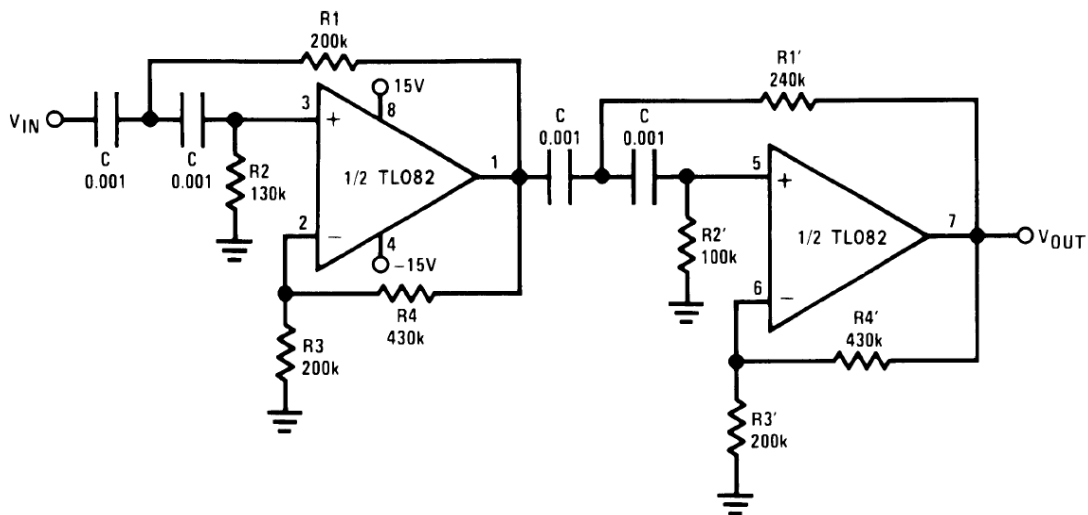
Fourth Order Low Pass Butterworth Filter



- Corner frequency (f_c) = $\sqrt{\frac{1}{R_1 R_2 C C_1}} \cdot \frac{1}{2\pi} = \sqrt{\frac{1}{R_1' R_2' C C_1}} \cdot \frac{1}{2\pi}$
- Passband gain (H_0) = $(1 + R_4/R_3) (1 + R_4'/R_3')$
- First stage Q = 1.31
- Second stage Q = 0.541
- Circuit shown uses nearest 5% tolerance resistor values for a filter with a corner frequency of 100 Hz and a passband gain of 100
- Offset nulling necessary for accurate DC performance

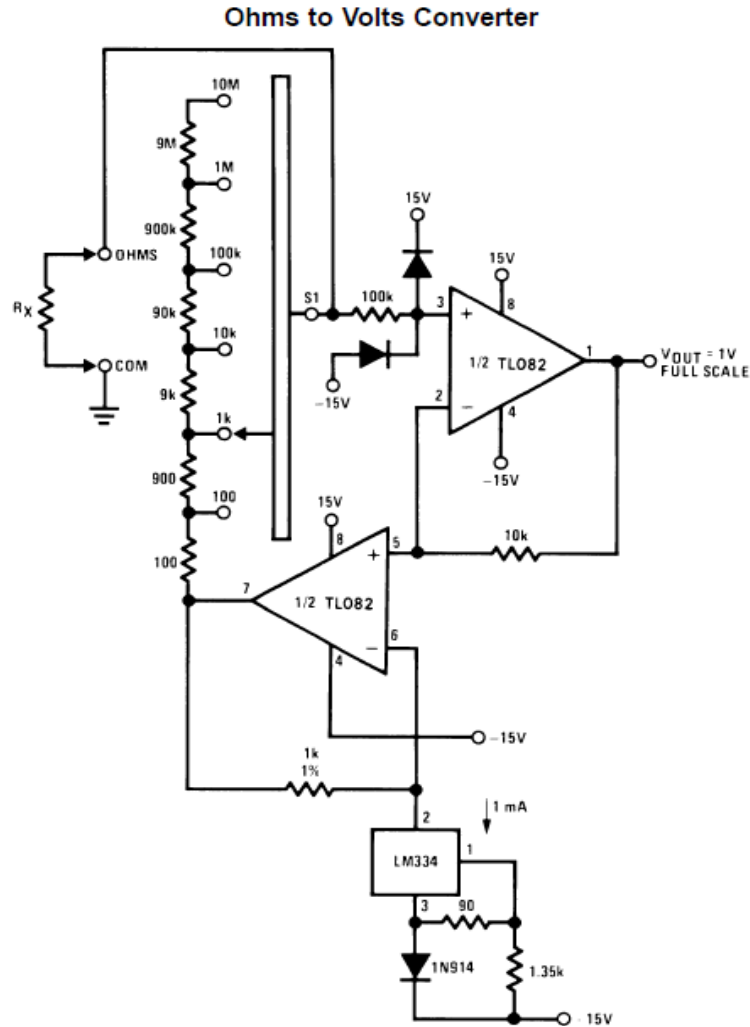
Fourth-order high-pass filtering

Fourth Order High Pass Butterworth Filter



- Corner frequency (f_c) = $\sqrt{\frac{1}{R_1 R_2 C^2}} \cdot \frac{1}{2\pi} = \sqrt{\frac{1}{R_1' R_2' C^2}} \cdot \frac{1}{2\pi}$
- Passband gain (H_0) = $(1 + R_4/R_3) (1 + R_4'/R_3')$
- First stage Q = 1.31
- Second stage Q = 0.541
- Circuit shown uses closest 5% tolerance resistor values for a filter with a corner frequency of 1 kHz and a passband gain of 10

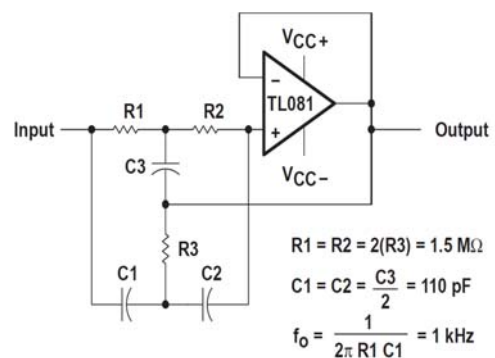
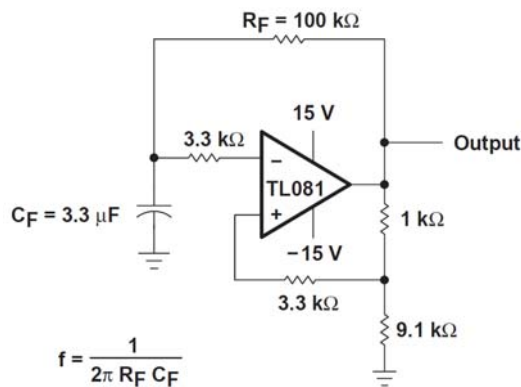
Resistance voltage conversion



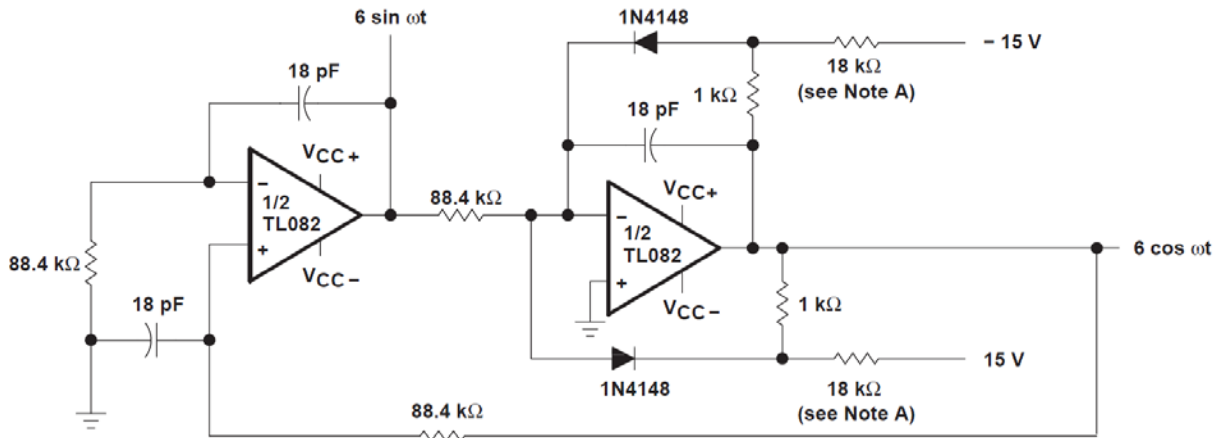
$$V_O = \frac{1V}{R_{LADDER}} \times R_X$$

Where R_{LADDER} is the resistance from switch S1 pole to pin 7 of the TL082CP.

Typical lines

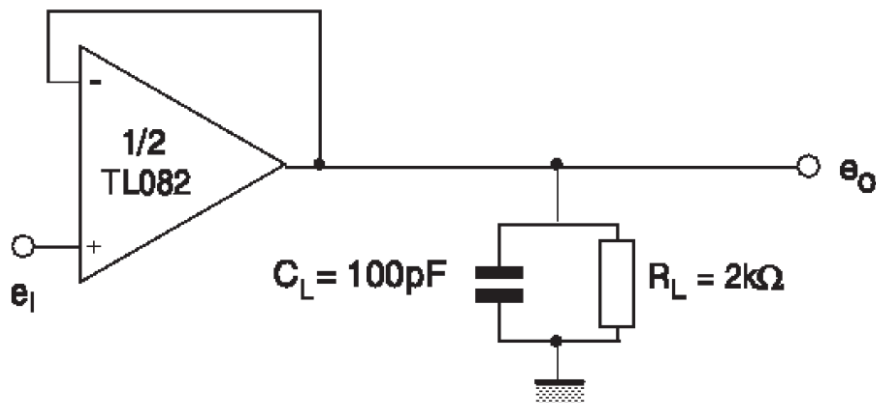


100 kHz quadrature oscillator 100- KHz Quadrature Oscillator

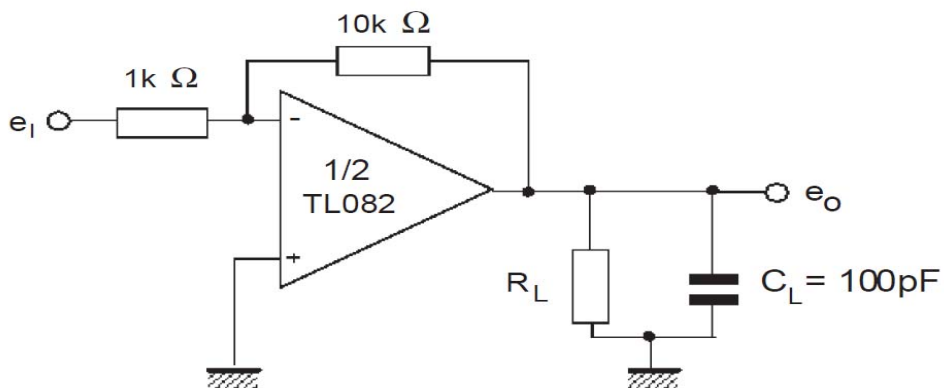


NOTE A: These resistor values may be adjusted for a symmetrical output.

Voltage Follower voltage follower

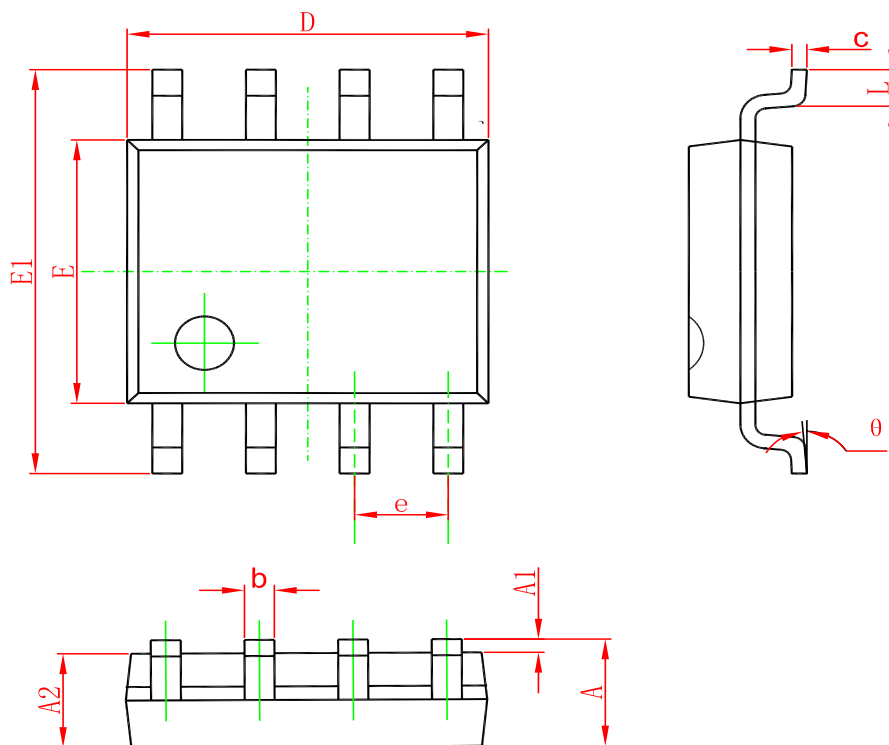


Gain-of-10 Inverting Amplifier with gain of 10



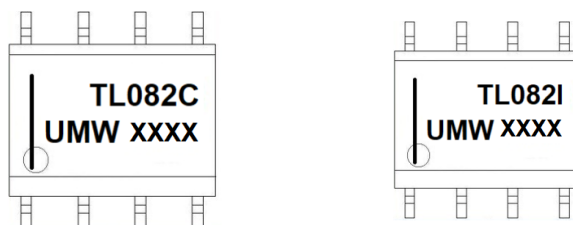
PACKAGE OUTLINE DIMENSIONS

SOP-8



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°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW TL082CDR	SOP-8	2500	Tape and reel
UMW TL082IDR	SOP-8	2500	Tape and reel

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[E2-A](#) [UPC458G2-E1-A](#) [UPC824G2-E2-A](#) [UPC4574G2-E2-A](#) [UPC4558G2-E2-A](#) [UPC4560G2-E1-A](#) [UPC258G2-E1-A](#) [UPC4742GR-9LG-](#)
[E1-A](#) [UPC4742G2-E1-A](#) [UPC832G2-E2-A](#) [UPC842G2-E1-A](#) [UPC802G2-E1-A](#) [UPC4741G2-E2-A](#) [UPC4572G2-E2-A](#) [UPC844GR-9LG-](#)
[E2-A](#) [UPC259G2-E1-A](#) [UPC4741G2-E1-A](#) [UPC4558G2-E1-A](#) [UPC1251GR-9LG-E1-A](#) [UPC4744G2-E1-A](#) [UPC4092G2-E1-A](#)
[UPC4574G2-E1-A](#) [UPC4062G2-E2-A](#) [UPC451G2-E2-A](#) [UPC832G2-E1-A](#) [UPC844GR-9LG-E1-A](#)