RE46C100

Piezoelectric Horn Driver Circuit

Features:

- Low Quiescent Current (< 100 nA)
- Low Driver R_{ON} – 20Ω typical at 9V
- Wide Operating Voltage Range
- Available in 8-pin DFN, PDIP and SOIC packages

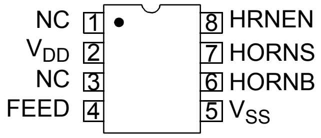
General Description:

The RE46C100 devices are intended for applications using a self oscillating piezoelectric horn, although it can be used in direct drive applications. Feedback control and a driver circuit are provided, as well as a horn enable function.

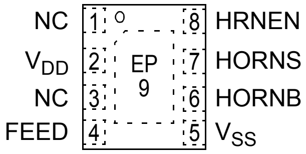
The RE46C100 is intended for use in smoke detectors, CO detectors, personal security products and electronic toys.

Package Types

RE46C100
PDIP, SOIC

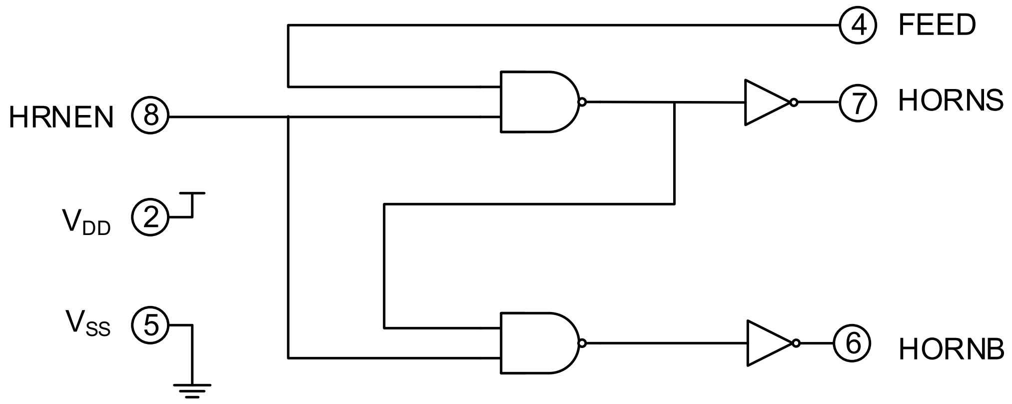


RE46C100
2x3 DFN*

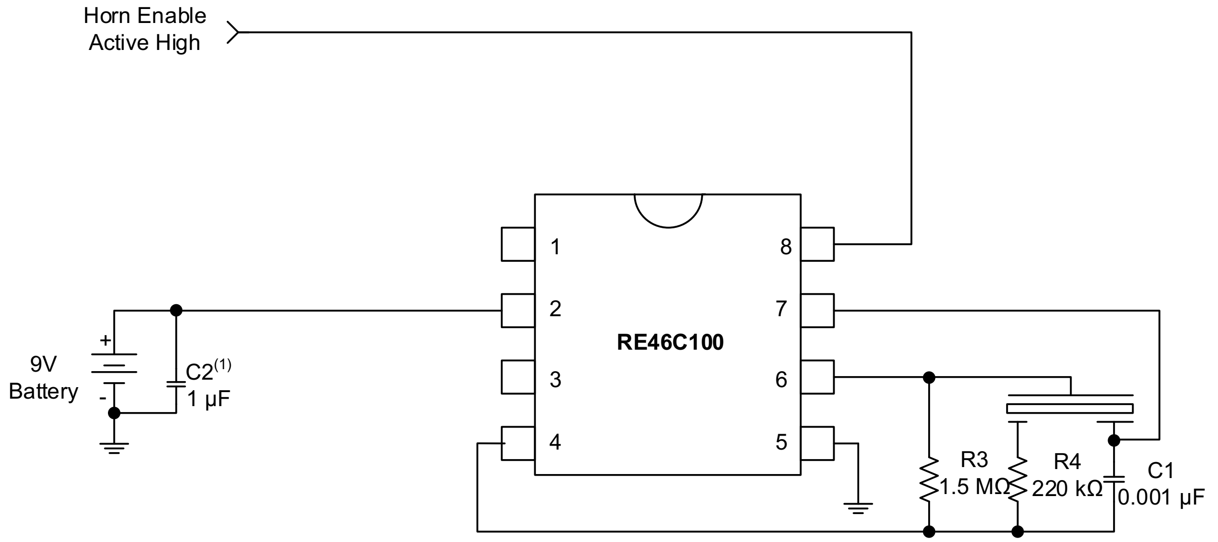


* Includes Exposed Thermal Pad (EP); see Table 2-1.

Functional Block Diagram



Typical Application



Note 1: Place C2 close to the device power pins to minimize horn switching noise.

1.0 ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings†

Supply Voltage.. V_{DD} = 18V
Input Voltage Range Except FEED, TEST....... V_{IN} = -0.3V to V_{DD} + 0.3V
FEED Input Voltage Range .... V_{INFD} =-10 to +22V
Input Current except FEED ....I_{IN} = 10 mA
Operating Temperature.....................................T_A = -40 to +85°C
Storage Temperature..................................T_{STG} = -55 to +125°C
Maximum Junction Temperature .... T_J = +150°C

† Notice: Stresses above those listed under “Maximum ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation listings of this specification is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability.

DC ELECTRICAL CHARACTERISTICS

DC Electrical Characteristics: Unless otherwise indicated, all parameters apply at T_A = +25°C, V_{DD} = 9V, Typical Application.

Parameter	Symbol	Test Pin	Min.	Typ.	Max.	Units	Conditions
Supply Voltage	V_{DD}	2	6	9	16	V	Operating
Supply Current	I_{DD1}	2	—	—	100	nA	HRNEN = 0V, FEED = 0V
Input Voltage Low	V_{IL1}	8	—	—	1	V	
Input Voltage High	V_{IH1}	8	2.3	—	—	V	
Input Leakage Low	I_{IL1}	8	—	—	-100	nA	$V_{IN} = V_{SS}$
	I_{LFD}	4	—	—	-50	µA	FEED = -10V
Input Leakage High	I_{IH1}	8	—	—	100	nA	$V_{IN} = V_{DD}$
	I_{HFD}	4	—	—	50	µA	FEED = 22V
Output Voltage Low	V_{OL1}	6, 7	—	0.3	0.5	V	I_{OL} = 16 mA
	V_{OL2}	6, 7	—	—	0.9	V	I_{OL} = 16 mA, V_{DD} = 7.2V
Output Voltage High	V_{OH1}	6, 7	8.5	8.7	—	V	I_{OH}= -16 mA
	V_{OH2}	6, 7	6.3	—	—	V	I_{OH} = -16 mA, V_{DD} = 7.2V

TEMPERATURE SPECIFICATIONS

Electrical Specifications: Unless otherwise indicated, all parameters apply at T_A = +25°C, V_{DD} = 9V, Typical Application.

Parameters	Sym.	Min.	Typ.	Max.	Units	Conditions
Temperature Ranges						
Operating Temperature Range	T_A	-40	—	+85	°C	
Storage Temperature Range	T_{STG}	-55	—	+125	°C	
Thermal Package Resistances						
Thermal Resistance, 8L 2x3 DFN	θ_{JA}	—	75	—	°C/W	
Thermal Resistance, 8L-PDIP	θ_{JA}	—	89.3	—	°C/W	
Thermal Resistance, 8L-SOIC	θ_{JA}	—	149.5	—	°C/W	

2.0 PIN DESCRIPTIONS

The descriptions of the pins are listed in Table 2-1.

TABLE 2-1: PIN FUNCTION TABLE

RE46C100 PDIP, SOIC	**RE46C100** DFN	**Symbol**	**Description**
1	1	NC	No connection
2	2	V_{DD}	Connect to the positive supply voltage
3	3	NC	No connection
4	4	FEED	Usually connected to the feedback electrode through a current-limiting resistor. If not used, this pin must be connected to V_{DD} or V_{SS}.
5	5	V_{SS}	Connect to the negative supply voltage
6	6	HORNB	This pin is connected to the metal electrode of a piezoelectric transducer.
7	7	HORNS	This pin is a complementary output to HORNB, connected to the ceramic electrode of the piezoelectric transducer.
8	8	HRNEN	This pin enables the horn with a logic high.
—	9	EP	Exposed thermal pad. This pad should be connected to V_{SS}.

3.0 DEVICE DESCRIPTION

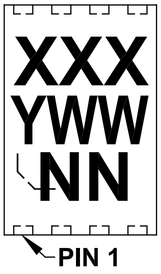
The RE46C100 horn driver provides the circuitry necessary to drive a three-terminal self-oscillating piezoelectric horn. It can also drive a two-terminal piezoelectric horn with the FEED pin used as a signal input. The horn driver provides a push-pull circuit to drive the horn, as shown in the Typical Application circuit.

In a self-oscillating application, the FEED pin is connected to the feedback pin of the piezoelectric horn through a resistor. To drive a two-terminal piezoelectric horn with an external signal, the FEED pin should be used as the external signal input. The horn is enabled when HRNEN is driven to a logic high and is silenced when HRNEN is driven to a logic low. The horn output can be modulated using the HRNEN input.

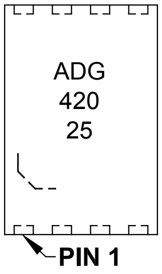
4.0 PACKAGING INFORMATION

4.1 Package Marking Information

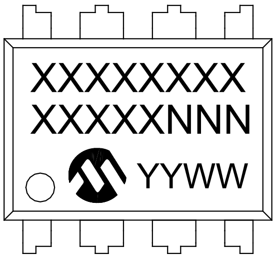
8-Lead DFN (2x3x0.9 mm)



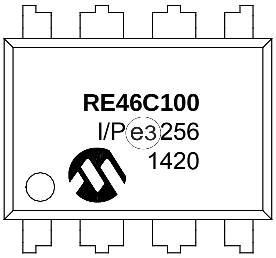
Example



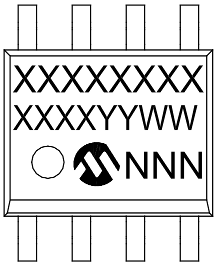
8-Lead PDIP (300 mil)



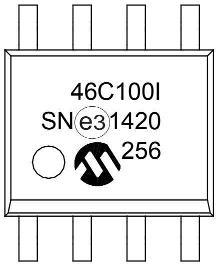
Example



8-Lead SOIC (3.90 mm)



Example

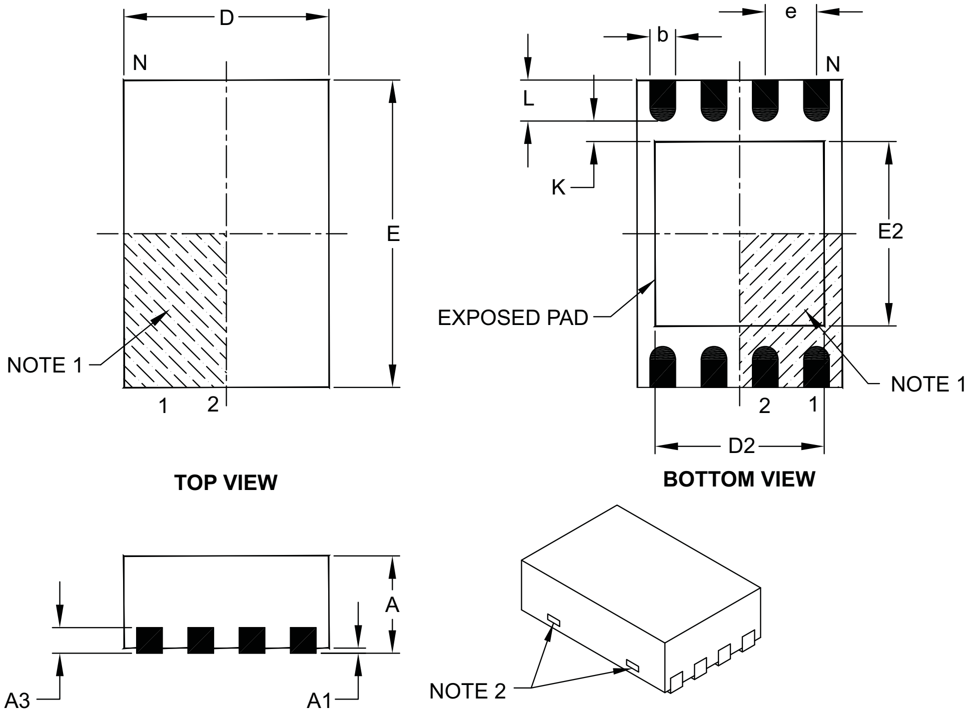


Legend:	XX...X	Customer-specific information
	Y	Year code (last digit of calendar year)
	YY	Year code (last 2 digits of calendar year)
	WW	Week code (week of January 1 is week ‘01’)
	NNN	Alphanumeric traceability code
	e3	Pb-free JEDEC designator for Matte Tin (Sn)
	*	This package is Pb-free. The Pb-free JEDEC designator (e3) can be found on the outer packaging for this package.

Note: In the event the full Microchip part number cannot be marked on one line, it will be carried over to the next line, thus limiting the number of available characters for customer-specific information.

8-Lead Plastic Dual Flat, No Lead Package (MC) – 2x3x0.9 mm Body [DFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		8	
Pitch	e		0.50 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Length	D		2.00 BSC	
Overall Width	E		3.00 BSC	
Exposed Pad Length	D2	1.30	–	1.55
Exposed Pad Width	E2	1.50	–	1.75
Contact Width	b	0.20	0.25	0.30
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	–	–

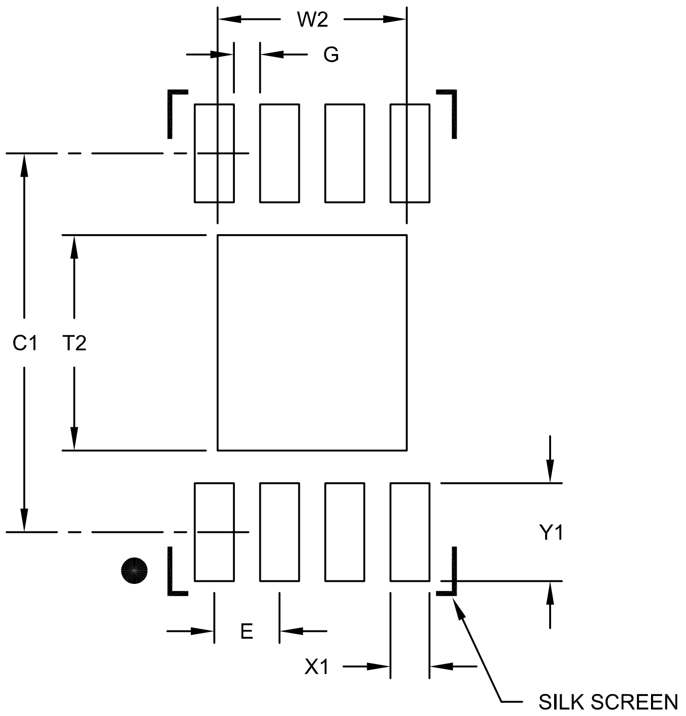
Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated.
4. Dimensioning and tolerancing per ASME Y14.5M.
    BSC: Basic Dimension. Theoretically exact value shown without tolerances.
    REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-123C

8-Lead Plastic Dual Flat, No Lead Package (MC) - 2x3x0.9mm Body [DFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E		0.50 BSC	
Optional Center Pad Width	W2			1.45
Optional Center Pad Length	T2			1.75
Contact Pad Spacing	C1		2.90	
Contact Pad Width (X8)	X1			0.30
Contact Pad Length (X8)	Y1			0.75
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2123B

8-Lead Plastic Dual In-Line (P) - 300 mil Body [PDIP]

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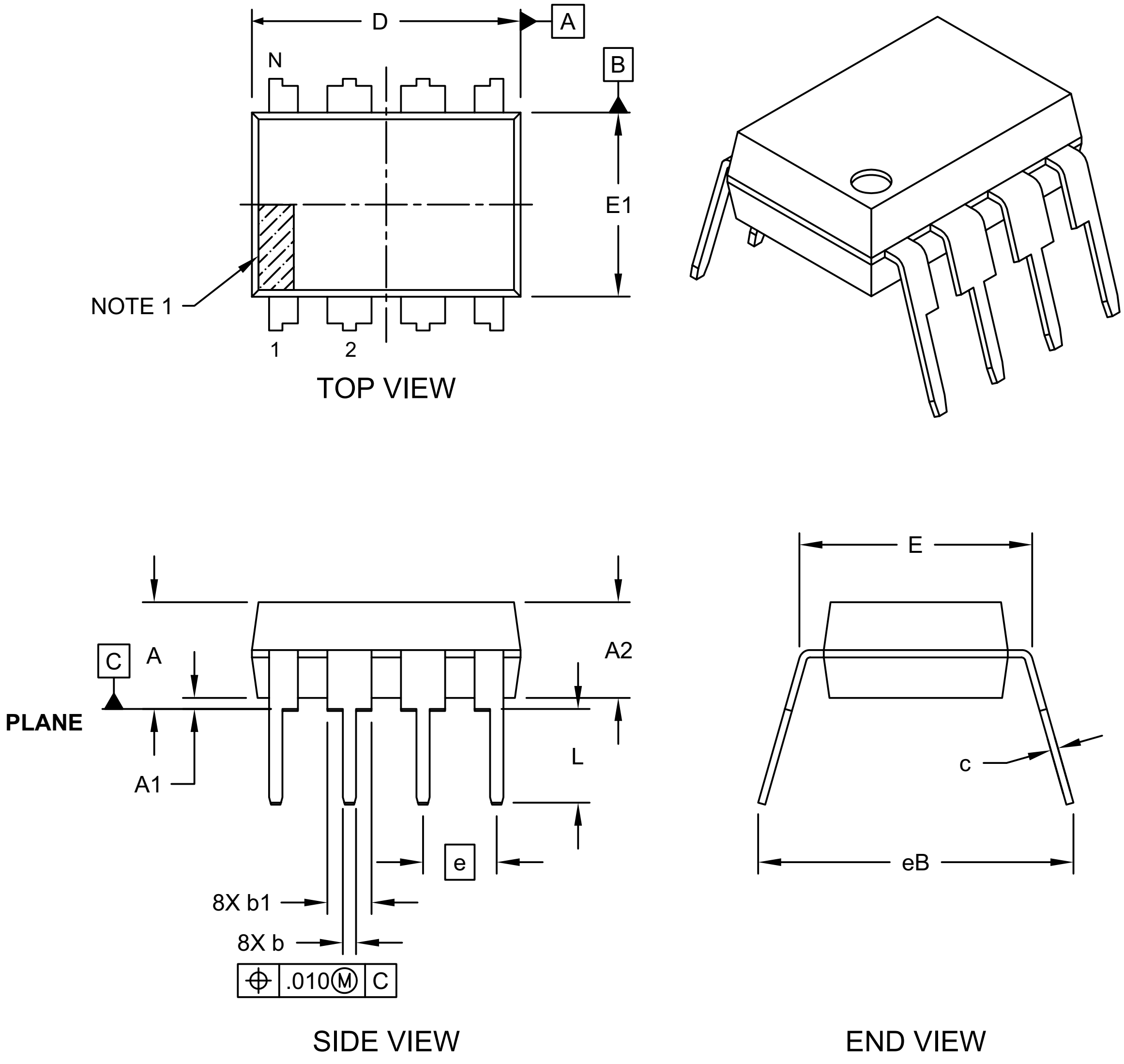
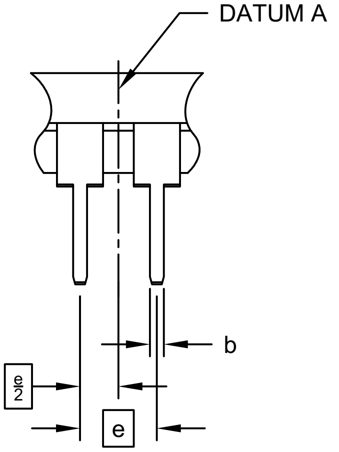
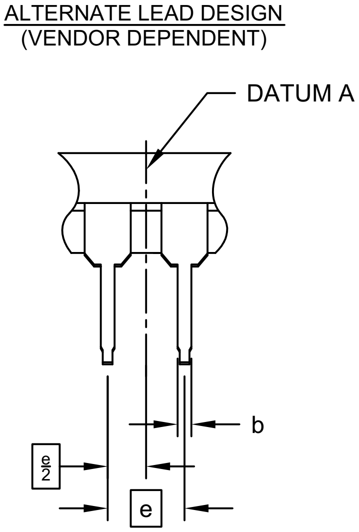


Microchip Technology Drawing No. C04-018D Sheet 1 of 2

8-Lead Plastic Dual In-Line (P) - 300 mil Body [PDIP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging





Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		8	
Pitch	e		.100 BSC	
Top to Seating Plane	A	-	-	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	-	-
Shoulder to Shoulder Width	E	.290	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	.348	.365	.400
Tip to Seating Plane	L	.115	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.040	.060	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	-	-	.430

Notes:

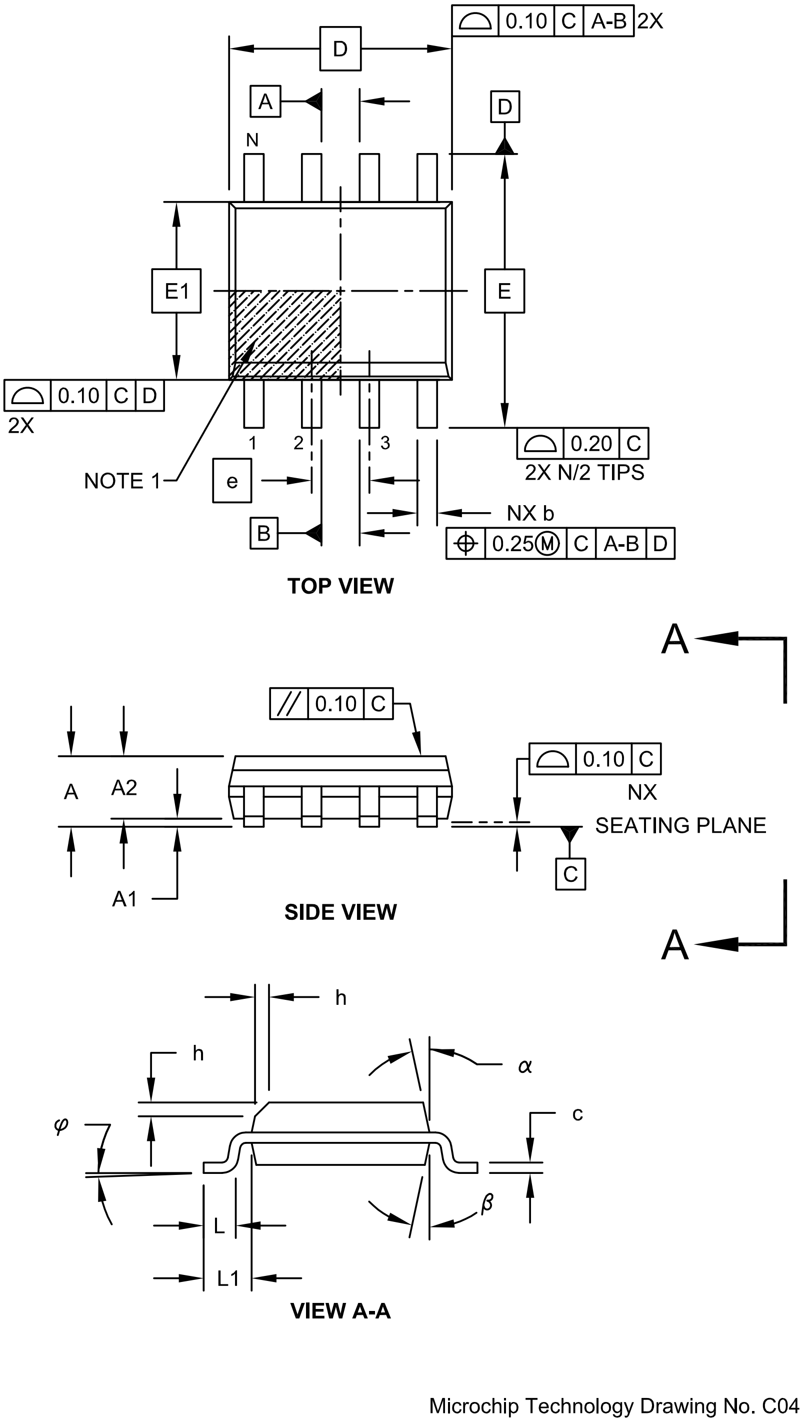
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-018D Sheet 2 of 2

8-Lead Plastic Small Outline (SN) - Narrow, 3.90 mm Body [SOIC]

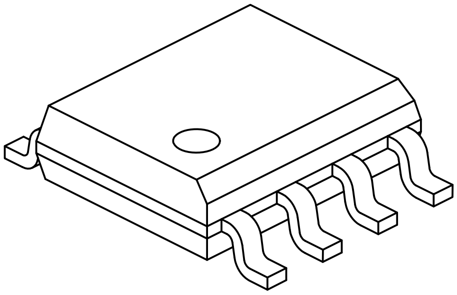
Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing No. C04-057C Sheet 1 of 2

8-Lead Plastic Small Outline (SN) - Narrow, 3.90 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	8		
Pitch	e	1.27 BSC		
Overall Height	A	-	-	1.75
Molded Package Thickness	A2	1.25	-	-
Standoff §	A1	0.10	-	0.25
Overall Width	E	6.00 BSC		
Molded Package Width	E1	3.90 BSC		
Overall Length	D	4.90 BSC		
Chamfer (Optional)	h	0.25	-	0.50
Foot Length	L	0.40	-	1.27
Footprint	L1	1.04 REF		
Foot Angle	φ	0°	-	8°
Lead Thickness	c	0.17	-	0.25
Lead Width	b	0.31	-	0.51
Mold Draft Angle Top	α	5°	-	15°
Mold Draft Angle Bottom	β	5°	-	15°

Notes:

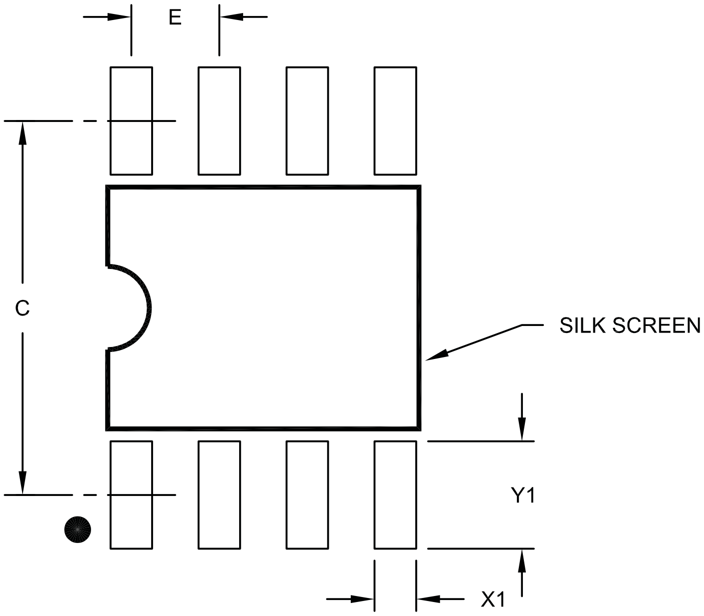
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing No. C04-057C Sheet 2 of 2

8-Lead Plastic Small Outline (SN) – Narrow, 3.90 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	1.27 BSC		
Contact Pad Spacing	C		5.40	
Contact Pad Width (X8)	X1			0.60
Contact Pad Length (X8)	Y1			1.55

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2057A

NOTES:

APPENDIX A: REVISION HISTORY

Revision B (June 2014)

The following is the list of modifications:

1. Added new package to the family (2x3 DFN) and related information throughout the document.
2. Added thermal package resistance information in Temperature Specifications.
3. Added package markings and drawings for all packages.
4. Added Product Identification System.

Revision A (May 2009)

- Original Release of this Document.

PRODUCT IDENTIFICATION SYSTEM

To order or obtain information, e.g., on pricing or delivery, refer to the factory or the listed sales office.

PART NO.	X	XX	T	X
Device	**Package**	**Number of Pins**	**Tape and Reel**	**Lead Free**

Device:
RE46C100: CMOS Photoelectric Smoke Detector ASIC
RE46C100T: CMOS Photoelectric Smoke Detector ASIC (Tape and Reel)

Package:
D = 8-Lead DFN
E = Plastic Dual In-Line (300 mil Body), 8-lead (PDIP)
S = Plastic Small Outline - Narrow, 3.90 mm Body, 8-Lead (SOIC)

Examples:

a) RE46C100D8F: 8LD DFN Package, Lead Free
b) RE46C100D8TF: 8LD DFN Package, Tape and Reel, Lead Free
c) RE46C100E8F: 8LD PDIP Package, Lead Free
d) RE46C100S8F: 8LD SOIC Package, Lead Free
e) RE46C100S8TF: 8LD SOIC Package, Tape and Reel, Lead Free

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Tel: 91-11-4160-8631
Fax: 91-11-4160-8632

India - Pune
Tel: 91-20-3019-1500

Japan - Osaka
Tel: 81-6-6152-7160
Fax: 81-6-6152-9310

Japan - Tokyo
Tel: 81-3-6880- 3770
Fax: 81-3-6880-3771

Korea - Daegu
Tel: 82-53-744-4301
Fax: 82-53-744-4302

Korea - Seoul
Tel: 82-2-554-7200
Fax: 82-2-558-5932 or
82-2-558-5934

Malaysia - Kuala Lumpur
Tel: 60-3-6201-9857
Fax: 60-3-6201-9859

Malaysia - Penang
Tel: 60-4-227-8870
Fax: 60-4-227-4068

Philippines - Manila
Tel: 63-2-634-9065
Fax: 63-2-634-9069

Singapore
Tel: 65-6334-8870
Fax: 65-6334-8850

Taiwan - Hsin Chu
Tel: 886-3-5778-366
Fax: 886-3-5770-955

Taiwan - Kaohsiung
Tel: 886-7-213-7830

Taiwan - Taipei
Tel: 886-2-2508-8600
Fax: 886-2-2508-0102

Thailand - Bangkok
Tel: 66-2-694-1351
Fax: 66-2-694-1350

EUROPE

Austria - Wels
Tel: 43-7242-2244-39
Fax: 43-7242-2244-393

Denmark - Copenhagen
Tel: 45-4450-2828
Fax: 45-4485-2829

France - Paris
Tel: 33-1-69-53-63-20
Fax: 33-1-69-30-90-79

Germany - Dusseldorf
Tel: 49-2129-3766400

Germany - Munich
Tel: 49-89-627-144-0
Fax: 49-89-627-144-44

Germany - Pforzheim
Tel: 49-7231-424750

Italy - Milan
Tel: 39-0331-742611
Fax: 39-0331-466781

Italy - Venice
Tel: 39-049-7625286

Netherlands - Drunen
Tel: 31-416-690399
Fax: 31-416-690340

Poland - Warsaw
Tel: 48-22-3325737

Spain - Madrid
Tel: 34-91-708-08-90
Fax: 34-91-708-08-91

Sweden - Stockholm
Tel: 46-8-5090-4654

UK - Wokingham
Tel: 44-118-921-5800
Fax: 44-118-921-5820

03/25/14

Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

Как с нами связаться

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