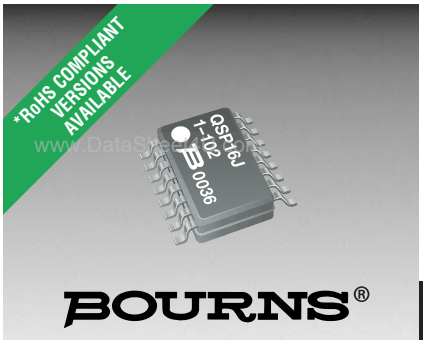

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Features

- Lead free versions available
- RoHS compliant (lead free version)*
- Multiple isolated resistors
- Stable thin-film-on-silicon technology
- Ultra-miniature packages to JEDEC standards

Applications

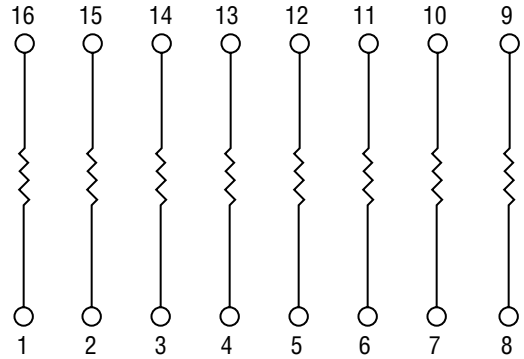
- Series bus resistance
- Pull-up/pull-down
- Ideal for space-constrained applications

Thin Film on Silicon 2QSP / 2NBS -XX1 Isolated Resistors

General Information

Isolated resistor networks are commonly used in digital circuits where series resistors are required on the system bus. Fabricated with Tantalum Nitride and Nickel Chromium technology on Silicon, these resistors feature excellent stability, TCR and tracking performance. This product series is available in a range of miniature package types conforming to JEDEC standards.

Package Schematic



Electrical & Environmental Characteristics

Electrical Characteristics	Symbol	Minimum	Nominal	Maximum	Unit
Resistance Range	R	10		100 K	Ω
Tolerance: Absolute Ratio		 ±0.5 % ±0.1 %		 ±5 % ±2 %	 Ω Ω
TCR: Absolute Tracking			 100	 150 25	 ppm/°C ppm/°C
Operating Voltage				50	V
Environmental Characteristics ESD		 2 K			 V
Operating Temperature	T_J	-55		+125	°C
Storage Temperature	T_{stg}	-65		+150	°C
Power Rating per Resistor @ 70 °C				0.1	Watt
Power Rating per Package @ 70 °C: QSOP: 16 Pin 20, 24 Pin 28 Pin NBSOIC: 8 Pin 14, 16 Pin				 0.75 1.00 1.12 0.60 1.00	 Watt Watt Watt Watt Watt

*RoHS Directive 2002/95/EC Jan 27 2003 including Annex

Specifications are subject to change without notice.
Customers should verify actual device performance in their specific applications.

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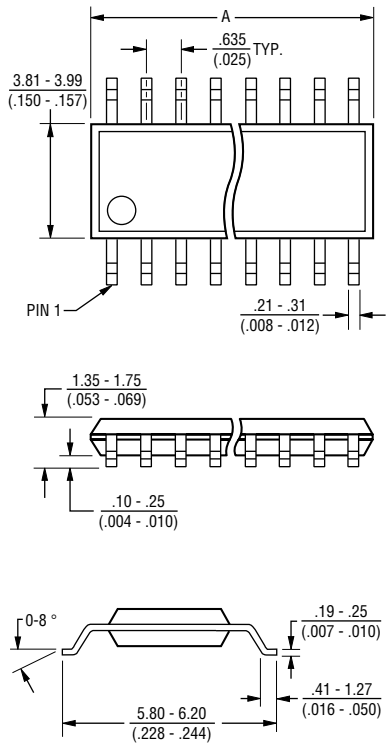
Mechanical Characteristics

QSOP Package Dimensions

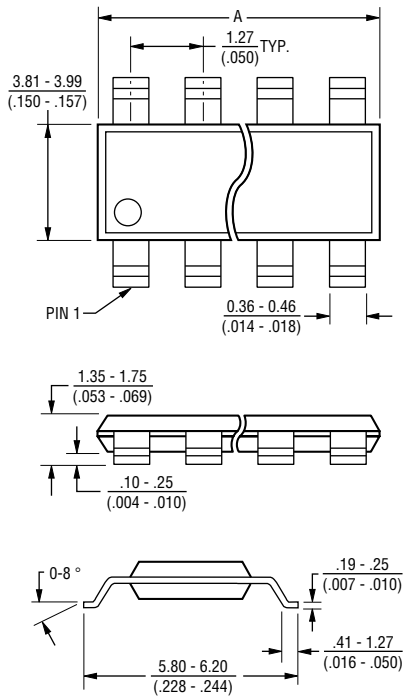


Model	A
2QSP16	4.80 - 4.98 (.189 - .196)
2QSP20	8.56 - 8.74 (.337 - .344)
2QSP24	8.56 - 8.74 (.337 - .344)
2QSP28	9.80 - 9.98 (.386 - .393)

Governing dimensions are in mm. Dimensions in parentheses are in inches and are approximate.

JEDEC Reference Number MO-137.

Narrow-Body SOIC Package Dimensions



Model	A
2NBS08	4.80 - 4.98 (.189 - .196)
2NBS14	8.56 - 8.74 (.337 - .344)
2NBS16	9.80 - 9.98 (.386 - .393)

Governing dimensions are in mm. Dimensions in parentheses are in inches and are approximate.

JEDEC Reference Number MS-012.

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Thin Film on Silicon 2QSP / 2NBS -XX1 Isolated Resistors

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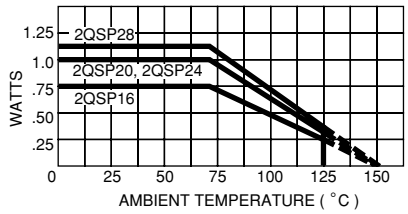
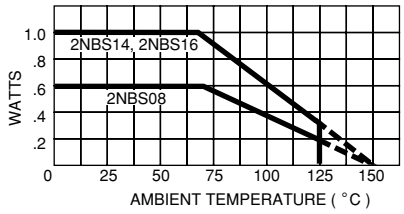
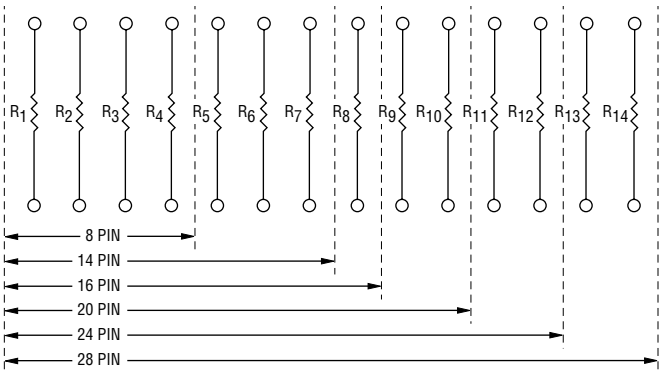
QSOP Package Power Temperature Derating Curve



Narrow-Body SOIC Package Power Temperature Derating Curve

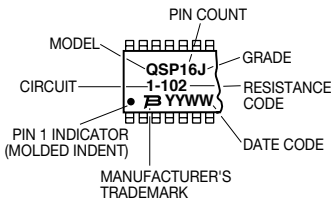


Schematic



Typical Part Marking

Represents total content. Layout may vary.



Standard Resistance Values

Resistance (ohms)	Resistance Code
10 22 33	100 220 330
39 47 51	390 470 510
68 120 220	680 121 221
270 330 470	271 331 471
510 680 1 K	511 681 102
2.2 K 4.7 K 5 K	222 472 502
8.2 K 10 K 18 K	822 103 183
20 K 47 K 50 K	203 473 503
100 K	104

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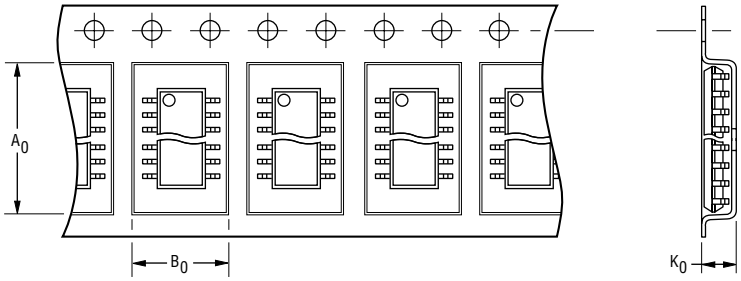
Dispensing

For large quantities, the product will be dispensed in Tape and Reel (see diagram below).



DIMENSIONS = MM (INCHES)

Package	A_0	B_0	K_0	Width	Pitch	No. of Pieces per 13 " reel	No. of Pieces per tube
QSOP							
16 Pin	6.4 (0.252)	5.2 (0.205)	2.1 (0.083)	12 (0.472)	8 (0.315)	3,500	98
20, 24 Pin	6.5 (0.256)	9.0 (0.354)	2.1 (0.083)	16 (0.630)	8 (0.315)	3,500	56
28 Pin	6.5 (0.256)	10.3 (0.406)	2.1 (0.083)	16 (0.630)	8 (0.315)	3,500	49
NBSOIC							
8 Pin	6.4 (0.252)	9.0 (0.354)	2.1 (0.083)	12 (0.472)	8 (0.315)	3,500	98
14 Pin	6.5 (0.256)	9.0 (0.354)	2.1 (0.083)	16 (0.630)	8 (0.315)	3,500	56
16 Pin	6.5 (0.256)	9.0 (0.354)	2.1 (0.083)	16 (0.630)	8 (0.315)	3,500	49

How To Order

2 QSP 16 - T J 1 - 472 __

Product Class
Thin-Film-on-Silicon

Standard Package Style
QSP = QSOP
NBS = Narrow-Body SOIC

Pin Count
QSP = 16, 20, 24, 28
NBS = 8, 14, 16

Dispensing
R = Reel
T = Tube

Standard Grade
Tolerance
J = ±5 %
G = ±2 %
F = ±1 %

Circuit
1 = Isolated

Resistance Value Code
1st two digits are significant,
3rd digit = number of zeros to follow to give resistance value in ohms.

Terminations
LF = 100 % Sn (lead free)
Blank = Sn/Pb

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