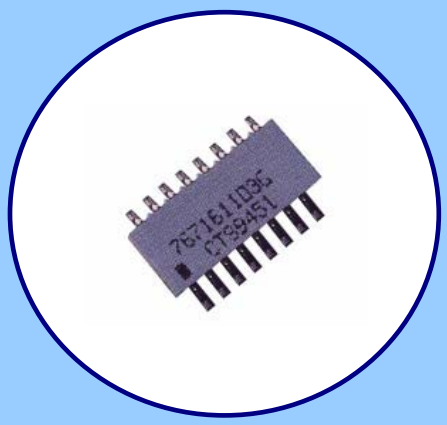
SERIES 767

SURFACE MOUNT RESISTOR NETWORK

FEATURES

- **Medium Body Design**
- **Surface Mount Gull Wing Design**
- **Solid Ceramic Construction**
- **No Internal Dendrite Growth**
- Requires 30% Less Board Space than Molded Products of the Same Power Rating
- Meets EIA PDP SOGN-0001 Outline
- Application Specific Circuits are Available
- Compatible with Solder Reflow Process
- Tape and Reel Packaging or Slide Packs
- **RoHS Compliant in Accordance with EU Directive 2011/65/EU**
  - Lead-Free Termination Finish
  - Exemption 7(c)-I, Electrical and electronic components containing lead [Pb] in glass



ORDERING INFORMATION

767 □ □ □ □ P □

NUMBER OF PINS
14 = 14 pins
16 = 16 pins

SCHEMATIC
1 - Bussed Circuit
3 - Isolated Circuit
5 - Dual Terminator Circuit
7 - Ladder

RESISTOR CODE
Refer to tables on Page 2.
[Codes are 3 - 4 characters.]

PACKAGING
Blank = Slide Pack
TR13 = Tape & Reel, 13" reel

RoHS COMPLIANT
Lead Finish: SnAgCu over Ni barrier on Cu lead wire.

TOLERANCE

Schematic 1 & 3	Schematic 5	Schematic 7
J = ±5% G = ±2% [Std] F = ±1% D = ±1/2%	Tolerance code is not added for dual terminator configuration. Standard tolerance is ±2%.	F = ±1 LSB D = ±1/2 LSB [LSB = Least Significant Bit]

Notes:

1. No dashes or spaces to appear in part number.
2. Example Part Numbers;
   Tape & Reel, 767141103GPTR13.
   Slide Pack, 767141103GP.

Not all performance combinations and resistor values may be available.
Contact your local CTS Representative or CTS Customer Service for availability.

ORDERING INFORMATION

AVAILABLE RESISTOR VALUES & EIA CODES

Ohms	Code	Ohms	Code	Ohms	Code	Ohms	Code	Ohms	Code	Ohms	Code
0	000X	68	680	470	471	3.3K	332	22K	223	180K	184
10	100	75	750	510	511	3.9K	392	27K	273	220K	224
12	120	82	820	560	561	4.7K	472	33K	333	270K	274
15	150	100	101	680	681	5.1K	512	39K	393	330K	334
18	180	110	111	820	821	5.6K	562	47K	473	390K	394
22	220	120	121	1K	102	6.8K	682	51K	513	470K	474
27	270	150	151	1.2K	122	8.2K	822	56K	563	510K	514
33	330	180	181	1.5K	152	10K	103	68K	683	560K	564
39	390	220	221	1.8K	182	12K	123	82K	823	680K	684
47	470	270	271	2.0K	202	15K	153	100K	104	820K	824
51	510	330	331	2.2K	222	18K	183	120K	124	1M	105
56	560	390	391	2.7K	272	20K	203	150K	154		

DUAL TERMINATOR RESISTOR VALUES – Schematic 5

The Series 766 part number includes the EIA Code value of the Thevenin equivalent resistances of R_1 and R_2. The Thevenin equivalent resistance is calculated in the following way. [The suffix letter relates only to the sequence of variations that equal the same equivalent resistance.]

$R_{EQ} = R_1 * R_2 / (R_1 + R_2)$

Example			
767145191A	R_1 = 330 Ohms	R_2 = 470 Ohms	R_{EQ} = 194 Ohms

[Pin N/2 is common to R_2 and Pin N is common to R_1.]

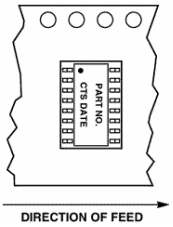
R1 Ohms	R2 Ohms	Thevenin Equivalent	CTS Code	R1 Ohms	R2 Ohms	Thevenin Equivalent	CTS Code	R3 Ohms	R4 Ohms	Thevenin Equivalent	CTS Code
25	50	17 ohms	150A	330	680	222 ohms	221A	180	220	99 ohms	101A
30	50	19 ohms	190A	330	390	179 ohms	181A	560	1K	359 ohms	361A
30	620	29 ohms	290A	330	220	132 ohms	131D	680	1K	405 ohms	401A
33	4.7K	33 ohms	330A	330	330	165 ohms	171B	750	750	375 ohms	381A
36	620	34 ohms	340A	360	720	240 ohms	241B	750	2.3K	566 ohms	571A
43	620	40 ohms	400A	360	600	225 ohms	231A	1K	3.3K	767 ohms	771A
68	189	50 ohms	500B	390	620	239 ohms	241A	1K	2K	667 ohms	671A
75	620	67 ohms	670A	470	1K	320 ohms	321A	1.1K	2.2K	733 ohms	731A
80	220	59 ohms	590A	470	680	278 ohms	281A	1.2K	1.2K	600 ohms	601A
81	130	50 ohms	500A	470	940	313 ohms	311A	1.5K	1.5K	750 ohms	751A
81	2.2K	78 ohms	780A	500	500	250 ohms	251A	1.5K	3.3K	1031 ohms	102A
100	200	67 ohms	670B	560	910	347 ohms	351A	2K	2K	1000 ohms	102B
100	430	81 ohms	810A	110	220	73 ohms	730A	2.2K	5.6K	1579 ohms	162A
100	150	60 ohms	600A	118	178	71 ohms	710A	2.2K	4.4K	1467 ohms	152A
106	169	65 ohms	650A	120	200	75 ohms	750B	2.2K	3.3K	1320 ohms	132A
200	1.5K	176 ohms	171D	120	180	72 ohms	720A	3K	6.2K	2022 ohms	202A
220	330	132 ohms	131A	120	120	60 ohms	600B	3K	2K	1200 ohms	122A
220	270	121 ohms	121B	150	150	75 ohms	750A	3.3K	4.7K	1939 ohms	192A
220	220	110 ohms	111D	160	260	99 ohms	990A	3.9K	3.3K	1788 ohms	182A
240	170	100 ohms	101C	160	240	96 ohms	960A	4.7K	22K	3873 ohms	392A
240	620	173 ohms	171C	160	270	100 ohms	101D	5K	5K	2500 ohms	252A
250	250	125 ohms	131B	162	260	100 ohms	101B	6.8K	22K	5194 ohms	522A
270	470	171 ohms	171A	180	300	113 ohms	111B	10K	51K	8361 ohms	842A
270	180	108 ohms	111C	180	470	130 ohms	131C	50K	100K	33,333 ohms	333A
271	131	88 ohms	880A	180	390	123 ohms	121A				
330	470	194 ohms	191A	180	270	108 ohms	111A				

1. All tolerances +/-2%.
2. Other values available on request.
3. Suffix letter has no significance - assigned in sequential order.

PACKAGING INFORMATION

Tape & Reel	14 Pin	16 Pin
Tape Width	24mm	24mm
Tape Pitch	12mm	12mm

Reel Diameter	13"	13"
No. Parts/Reel	2,000	2,000



Slide Packs	14 Pin	16 Pin
Tube Length	20"	20"
No. Parts/Slide Pack	48	43

ELECTRICAL & ENVIRONMENTAL CHARACTERISTICS

GENERAL REQUIREMENTS

Resistance Range:
Standard: 10 Ohms to 1M Ohms

Operating Temperature Range:
-55°C to +125°C

Temperature Coefficient:
10 Ohms to 99 Ohms - ±200ppm/°C typical
100 Ohms to 1M Ohms - ±100ppm/°C typical

Resistance Tolerance:
Standard: ±2% or 0.5 Ohms [whichever is greater]
Special: ±0.25% or 0.3 Ohms [whichever is greater]

Dielectric Strength:
100 V_{AC}

Maximum Operating Voltage:
50 V, not to exceed rated power

POWER RATING
[Total Network Power]

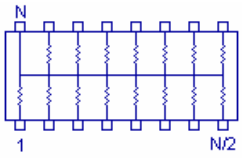
Temperature	14 Pin	16 Pin
@25°C	2.0W	2.3W
@70°C	1.3W	1.5W

MAXIMUM RESISTOR POWER
[Not to exceed total network power]

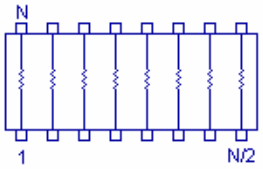
Schematic	1	3	5	7
@25°C	0.15W	0.30W	0.15W	0.15W
@70°C	0.10W	0.20W	0.10W	0.10W

CIRCUIT TYPES

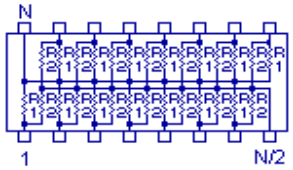
BUSSED [Schematic 1]



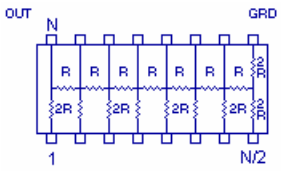
ISOLATED [Schematic 3]



DUAL TERMINATOR [Schematic 5]



R/2R LADDER [Schematic 7]



ENVIRONMENTAL

TEST	MAXIMUM % DELTA R	MIL-STD 202 METHOD	TEST CONDITION/DESCRIPTION
Temperature Cycling	0.25%	107	Condition B; 5 cycles, -65°C to +125°C
Short Time Overload	0.25%		2 1/2 times rated voltage, 5 seconds [100V maximum]
Moisture Resistance	0.50%	106	240 hours, -10°C to +65°C, 90% RH, 0.1 rated load
Load Humidity	1.00%		1000 hours, +70°C, 85-92% RH, 0.1 rated load
High Temperature Exposure	1.00%		240 hours @ +125°C, no load
Load Life	1.00%	108	Condition F; 2000 hours @ +70°C, rated load
Resistance to Solder Heat	0.25%		30 seconds @ +218°C, dwell
Mechanical Shock	0.25%	213	Condition I; 100g, 1m second, 3 shocks each plane
Vibration	0.25%	204	Condition D; 20g, 10-2000Hz, 4 hours/plane
Terminal Strength	0.25%		24 hours @ -65°C, no load
Low Temperature Storage	0.25%		45 minutes @ -65°C, no load
Low Temperature Operation	0.25%		94V-0
Flammability	N/A		20g, 10-2000Hz, 4 hours/plane
Non-Fungus	Pass		MIL-STD 810C
Resistance to Solvents	Pass		Isopropyl alcohol
Solderability	Pass		RMA Flux, +230°C, 5 seconds dip, 95% coverage

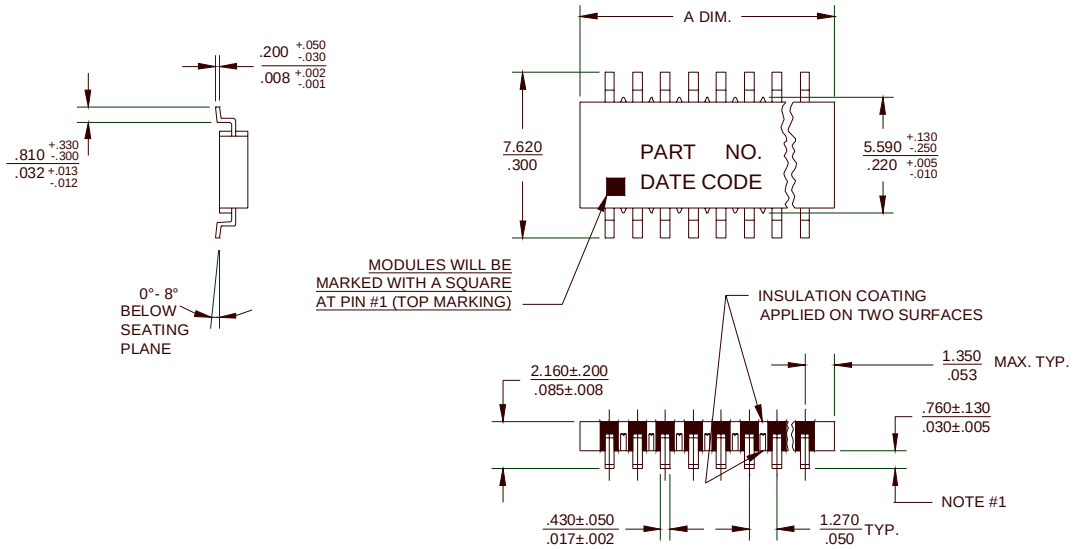
MECHANICAL SPECIFICATION

PACKAGE DRAWING

No. of Pins	"A" Dimension	
	mm	inch
14	9.91 ±0.25	0.390 ±0.010
16	11.18 ±0.25	0.440 ±0.010

Notes:

1. Lead Co-Planarity - 0.10mm maximum [0.039in.]
2. General Tolerances - ±0.25mm [±0.010in.]
3. Lead termination (e1). Barrier plating is nickel (Ni) with tin/silver/copper (Sn Ag Cu) finish.
4. Reflow conditions per JEDEC-J-STD-020, +260°C maximum.



RECOMMENDED LAND PATTERN

LEAD COUNT		A	B	C	D
14 Pin	mm	5.34	7.37	9.40	7.60
	in.	0.21	0.29	0.37	0.30
16 Pin	mm	5.34	7.37	9.40	8.90
	in.	0.21	0.29	0.37	0.35

