

## P/Active 1% Tolerance Dual Thévenin Termination Network

### Features

- Minimal ground bounce, crosstalk
- Stable 1% absolute tolerance elements
- 16 terminating lines per QSOP package
- Saves board space and reduces assembly cost

### Applications

- HSTL termination
- Thévenin termination
- ECL, TTL termination

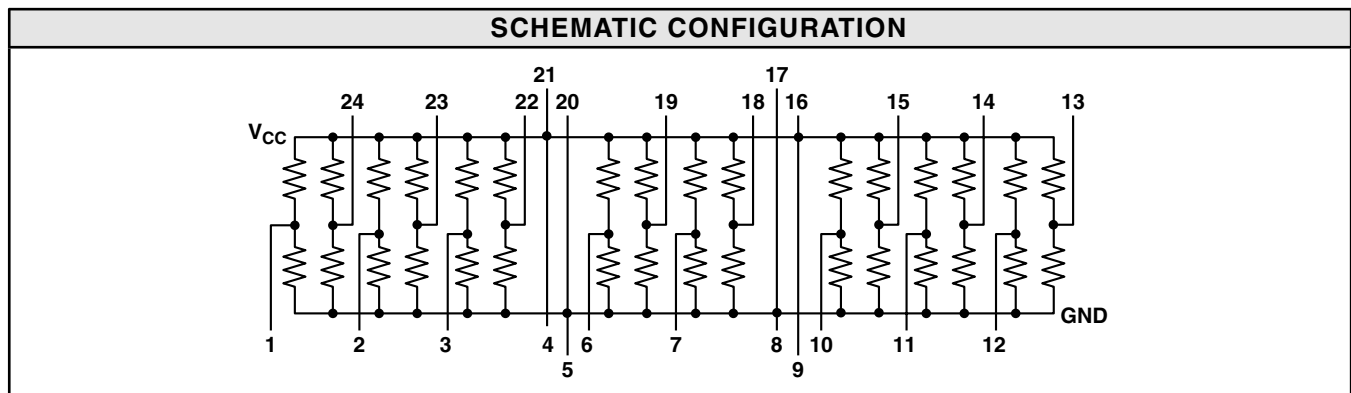
### Product Description

High speed logic devices like HSTL (High Speed Transceiver Logic) demand unique, high speed bus terminations. The dual Thévenin termination network provides 16 terminating channels per package, and optimizes signal integrity by reducing reflections and ringing. The terminations are available in a range of standard values and are ideal for use in HSTL busses. As seen in the schematic, R1 is typically tied to  $V_{CC}$  and serves as a pull-up resistor, while R2 functions as a pull-down resistor and is tied to ground (or the most negative supply voltage). In addition, the equivalent Thévenin

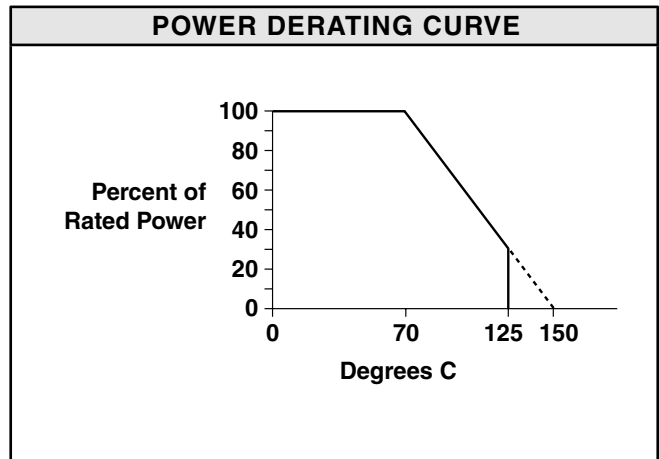
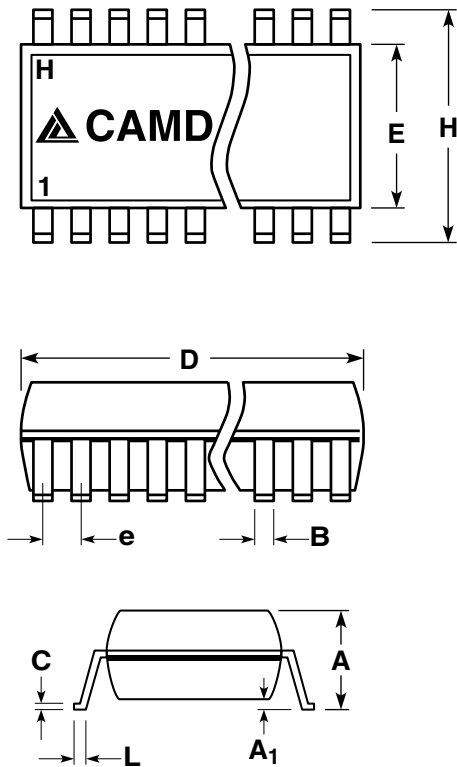
resistance (R1 in parallel with R2) should match the impedance of the trace. Ground-bounce and crosstalk are virtually eliminated using a proprietary lead-frame which includes four direct ground connections to the die substrate, as well as four double-bonded connections to  $V_{CC}$ , for a total of 8 commons. In addition, the resistors are trimmed to a tight absolute tolerance of 1% which provides tight impedance-matching and results in greatly reduced reflections. This unique proprietary design provides optimal signal integrity.

STANDARD VALUES	
Absolute Tolerance (R1 & R2)	±1%
TCR	±100ppm
Operating Temperature Range	0°C to 70°C
Power Rating/Resistor	100mW
Crosstalk (see Test Circuit)	30mV TYP
Package	24 Pin QSOP

BUS IMPEDANCE ( $\Omega$ )	R1( $\Omega$ )	R2 ( $\Omega$ )	CODE
47	94	94	001
50	100	100	002
56	112	112	003
68	136	136	004



STANDARD PART ORDERING INFORMATION					
R Code	Package		Ordering Part Number		Part Marking
	Pin	Style	Tubes	Tape & Reel	
001	24	QSOP	PAC001DTFQ/T	PAC001DTFQ/R	PAC001DTFQ
002	24	QSOP	PAC002DTFQ/T	PAC002DTFQ/R	PAC002DTFQ
003	24	QSOP	PAC003DTFQ/T	PAC003DTFQ/R	PAC003DTFQ
004	24	QSOP	PAC004DTFQ/T	PAC004DTFQ/R	PAC004DTFQ



MECHANICAL SPECIFICATIONS	
Lead Plating	Tin-Lead
Lead Material	Copper Alloy
Lead Coplanarity	0.004" (0.102mm)
Substrate Material	Silicon
Body Material	Molded Epoxy
Flammability	UL94V-0

PACKAGE DIMENSIONS, POWER DISSIPATION & ORDERING INFORMATION																
Package	QSOP															
Pins #	16				20				24				28			
	mm		inches		mm		inches		mm		inches		mm		inches	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
<b>A</b>	1.35	1.75	0.053	0.069	1.35	1.75	0.053	0.069	1.35	1.75	0.053	0.069	1.35	1.75	0.053	0.069
<b>A<sub>1</sub></b>	0.10	0.25	0.004	0.010	0.10	0.25	0.004	0.010	0.10	0.25	0.004	0.010	0.10	1.25	0.004	0.010
<b>B</b>	0.20	0.30	0.008	0.012	0.20	0.30	0.008	0.012	0.20	0.30	0.008	0.012	0.20	0.30	0.008	0.012
<b>C</b>	0.18	0.25	0.007	0.010	0.18	0.25	0.007	0.010	0.18	0.25	0.007	0.010	0.18	0.25	0.007	0.010
<b>D</b>	4.80	5.00	0.189	0.197	8.56	8.73	0.337	0.344	8.56	8.73	0.337	0.244	9.80	9.98	0.386	0.393
<b>E</b>	3.81	3.98	0.150	0.157	2.81	3.98	0.150	0.157	3.81	3.98	0.150	0.157	3.81	3.98	0.150	0.157
<b>e</b>	.64 BSC		0.025 BSC		.64 BSC		0.025 BSC		.64 BSC		0.025 BSC		0.64 BSC		0.025 BSC	
<b>H</b>	5.79	6.19	0.228	0.244	5.79	6.19	0.228	0.244	5.79	6.19	0.228	0.244	5.79	6.20	0.228	0.244
<b>L</b>	0.40	1.27	0.016	0.050	0.40	1.27	0.016	0.050	0.40	1.27	0.016	0.050	0.40	1.27	0.016	0.050
<b>P<sub>D</sub> @ 70°C</b>	<b>0.75W</b>				<b>1.00W</b>				<b>1.00W</b>				<b>1.00W</b>			
<b>#/tube</b>	<b>99 pcs</b>				<b>56 pcs</b>				<b>56 pcs</b>				<b>56 pcs</b>			
<b>#/tape &amp; reel</b>	<b>2,500 pcs</b>				<b>2,500 pcs</b>				<b>2,500 pcs</b>				<b>2,500 pcs</b>			