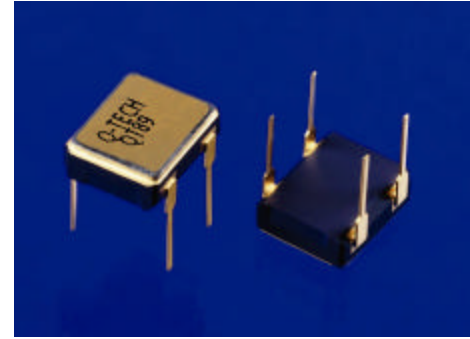


# QT89 Series

## 5.0Vdc and 3.3Vdc, STRAIGHT LEADS HIGH-RELIABILITY CLOCK OSCILLATORS

### FEATURES

- Broad frequency range from 500 kHz to 160 MHz.
- Rugged design for high shock and vibration.
- AC MOS, HCMOS, TTL, LVHCMOS logic.
- 5.0V or 3.3V Tri-State Output Option (D).
- High temperature reliability for Down-Hole applications.
- Straight leads.



### ELECTRICAL CHARACTERISTICS

PARAMETERS (5.0V ± 10%)	QT89AC	QT89HC	QT89T
Output frequency range (Fo)	<b>500.00 kHz – 125.00MHz</b> <i>(Low frequency down to 1kHz available in No-Tristate)</i>		<b>500.00 kHz – 85.000MHz</b>
Supply voltage (Vdd)	5.0Vdc ± 10%		
Frequency stability vs. temperature	See Option codes		
Operating temperature (Topr)	See Option codes		
Storage temperature (Tsto)	-62°C to +125°C		
Symmetry <i>(15pF at 50% output level AC or HC)</i> <i>(6TTL load at 1.4Vdc TTL)</i>	45/55% max. (500kHz ~ <16MHz) 40/60% max. (16MHz ~ 125MHz) <i>(Tighter symmetry available)</i>		
Operating supply current (Idd) <i>(No Load)</i> <i>(Lower current available)</i>	20 mA max. (500kHz ~ < 16MHz) 25 mA max. (16MHz ~ < 32MHz) 35 mA max. (32MHz ~ < 60MHz) 45 mA max. (60MHz ~ = 125MHz)		
Rise and Fall times (Tr/Tf) <i>(at 5.0Vdc supply, 15pF//10kohms load)</i>	6ns max. (Fo < 30M) 3ns max. (30M = Fo = 125M) <i>(between 10% to 90%)</i>	7ns max. (Fo < 30M) 5ns max. (30M = Fo = 125M) <i>(between 10% to 90%)</i>	5ns max. (Fo < 30M) 3ns max. (30M = Fo = 85M) <i>(between 0.8V to 2V)</i>
Output load (CL)	15pF // 10kohms <i>(50pF max. or 10TTL for F = 60M)</i> <i>(30pF max. or 6TTL for F = 85M)</i>	15pF // 10kohms <i>(2LSTTL)</i>	10TTL (F < 60MHz) 6TTL (60MHz to 85MHz)
Start-up time (Tstup) <i>15pF load</i>	5ms max.		
Output voltage (Voh/Vol)	0.9xVdd min. ; 0.1xVdd max.		2.4V min.; 0.4V max.
Enable/Disable Tristate function (*D)	Pin 1 VIH = 2.2V Oscillation; VIL = 0.8V High Impedance		
Jitter RMS 1s <i>(at 25°C)</i>	8ps typ. (<40MHz); 3ps typ. (= 40MHz)		
Aging <i>(at 70°C)</i>	± 5ppm/year max.		
Freq. vs. supply voltage tolerance (±10%)	± 4ppm max.		
<b>PARAMETERS (3.3V ± 10%)</b>			
<b>QT89L</b>			
Output frequency range (Fo)	<b>500.000 kHz – 160.000MHz</b> <i>(Low frequency down to 1kHz available in No-Tristate)</i>		
Supply voltage (Vdd)	3.3Vdc ± 10%		
Frequency stability vs. temperature	See Option codes		
Operating temperature (Topr)	See Option codes		
Storage temperature (Tsto)	-62°C to +125°C		
Operating supply current (Idd) <i>(No Load)</i> <i>(Lower current available for high-temperature applications)</i>	6 mA max. (500kHz ~ < 16MHz) 10 mA max. (16MHz ~ < 32MHz) 20 mA max. (32MHz ~ < 60MHz) 30 mA max. (60MHz ~ < 100MHz)		



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# QT89 Series

## 5.0Vdc and 3.3Vdc, STRAIGHT LEADS HIGH-RELIABILITY CLOCK OSCILLATORS

	40 mA max. (100MHz ~ < 130MHz) 45 mA max. (130MHz ~ 160MHz)
Symmetry (15pF, at 50% output level)	45/55% max. (500kHz ~ <16MHz); 40/60% max. (16MHz ~ 160MHz) (Tighter symmetry available)
Rise and Fall times (Tr/Tf) (at 3.3Vdc supply, 15pF //10kohms) (Between 10% and 90% of output level)	6ns max. (500kHz to < 40MHz) 3ns max. (40MHz ~ 160MHz)
Output load (CL)	15pF // 10kohms (30pF max. for F = 50MHz)
Start-up time (Tstup)	5ms max.
Output voltage (Voh/Vol)	0.9xVdd min. ; 0.1xVdd max.
Enable/Disable Tristate function (* D)	Pin 1 VIH = 2.2V Oscillation; VIL = 0.8V High Impedance
Jitter RMS 1s(at 25°C, 3.3Vdc supply)	15ps typ. (< 40MHz); 8ps typ. (= 40MHz)
Aging (at 70°C)	± 5ppm/year max.
Freq. vs. supply voltage tolerance (±10%)	± 4ppm max.

### ORDERING INFORMATION

**QT89 AC D 10 M - 85.000MHz**

Logic	Tristate Option	Freq. stability vs. Temperature	Screening option
AC = ACMOS	D (*)	<b>1</b> = ±100ppm at 0°C to +70°C <b>4</b> = ± 50ppm at 0°C to +70°C <b>5</b> = ± 25ppm at -20°C to +70°C <b>6</b> = ± 50ppm at -55°C to +105°C <b>9</b> = ± 50ppm at -55°C to +125°C <b>10</b> = ±100ppm at -55°C to +125°C <b>11</b> = ± 50ppm at - 40°C to +85°C <b>12</b> = ±100ppm at - 40°C to +85°C <b>14</b> = ± 20ppm at -20°C to +70°C <b>15</b> = ± 25ppm at - 40°C to +85°C  <b>± 40ppm to ± 350ppm for High-temperature applications at - 55°C to +200°C.</b> <i>Contact Q-Tech for details.</i>	<b>M</b> (Designate M for Product Level B MIL-PRF-55310 environmental screening). <i>(Left blank if unscreened)</i>
HC = HCMOS	(Left blank if No Tristate)		
T = TTL			
L = LVHCMOS			

For frequency stability vs. temperature options not listed herein, please request a custom part number.  
Part numbering examples: QT89ACD9M-100.000MHz; QT89T10-16.000MHz.

*Q-Tech will assign a custom part number for high-temperature applications with frequency-temperature stability tailored to specific requirements.*

### STANDARD SCREENING PER MIL-PRF-55310, LEVEL B

Internal Visual: MIL-STD-883, Method 2017 and 2032.  
 Stabilization bake: MIL-STD-883, Method 1008, Cond. C.  
 Temperature cycling: MIL-STD-883, Method 1010, Cond. B.  
 Constant acceleration: MIL-STD-883, Method 2001, Cond. A, Y1 axis.  
 Seal Fine Leak: MIL-STD-883, Method 1014, Cond. A.  
 Seal Gross Leak: MIL-STD-883, Method 1014, Cond. C.  
 Burn-in: 160 hours, 125°C with load.  
 Final Electrical tests.



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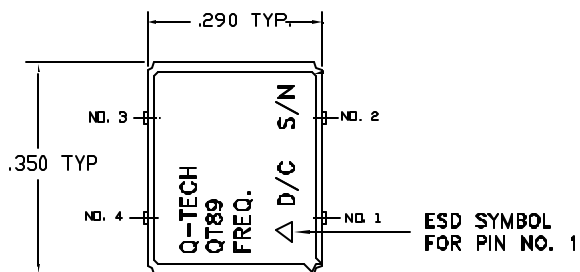
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## 5.0Vdc and 3.3Vdc, STRAIGHT LEADS HIGH-RELIABILITY CLOCK OSCILLATORS

### OUTLINE DRAWING

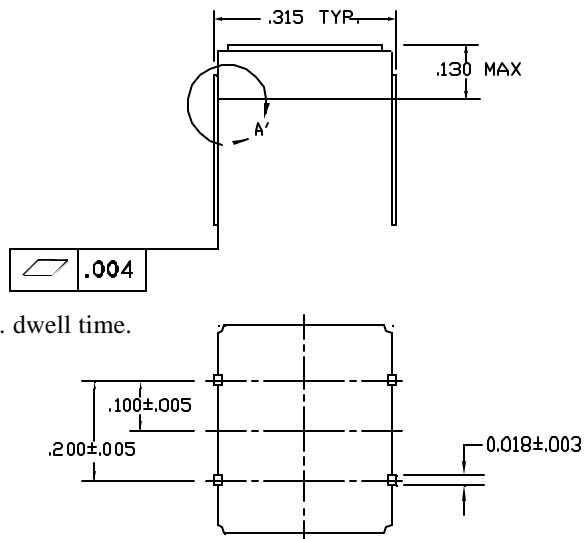
PIN NO.	FUNCTION
1	TRISTATE or NC
2	GND/CASE
3	OUTPUT
4	VDD



### STANDARD QCI ENVIRONMENTAL SPECIFICATIONS:

*(Custom requirements available upon request)*

- Vibration sinusoidal: MIL-STD-202, Method 204, Cond. D.
- Shock, non operating: MIL-STD-202, Method 213, Cond. I.
- Thermal shock, non operating: MIL-STD-202, Method 107, Cond. B.
- Ambient pressure, non operating: MIL-STD-202, 105, Cond. C, 5 min. dwell time.
- Resistance to solder heat: MIL-STD-202, Method 210, Cond. E.
- Moisture resistance: MIL-STD-202, Method 106.
- Terminal strength: MIL-STD-202, Method 211, Cond. C.
- Resistance to solvents: MIL-STD-202, Method 215.
- Solderability: MIL-STD-202, Method 208.



Standard packaging in Anti-Static Foam, unless otherwise specified.  
Leads solder dipped available.

Dimensions: inch

*Remark: Specifications subject to change without prior notice.  
Please contact our factory or visit our website, [www.q-tech.com](http://www.q-tech.com), for technical notes and updates.  
Please contact us for variations on these specifications.*



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