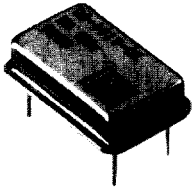


TTL/CMOS/HCMOS/ACMOS Voltage Controlled Crystal Oscillators

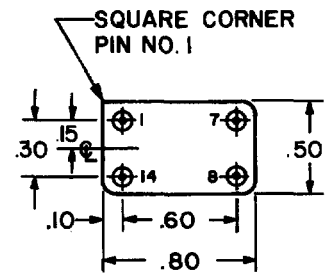
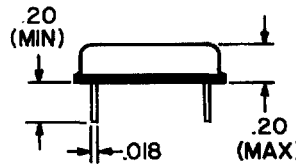
CO-401V
CO-441V



Features

- 32 kHz to 75 MHz Frequency Range
- Low Profile 4 Pin DIP
- TTL/HCMOS/ACMOS Compatible
- 3 Point Mount Crystal

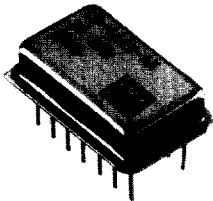
CO-401V
CO-441V



Available with insulated standoffs:
increases height to 0.23 maximum

Note: dimensions in inches

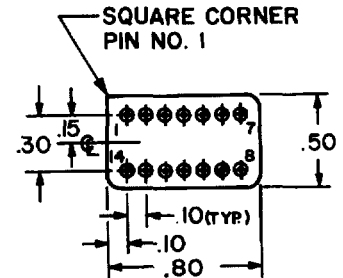
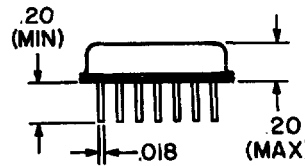
CO-402V
CO-442V



Features

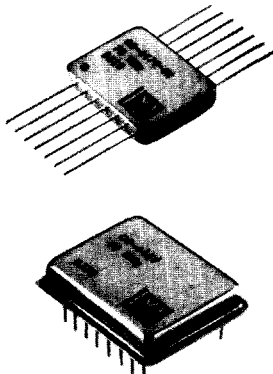
- 32 kHz to 75 MHz Frequency Range
- Low Profile 14 Pin DIP
- TTL/HCMOS/ACMOS Compatible
- 3 Point Mount Crystal

CO-402V
CO-442V



Note: dimensions in inches

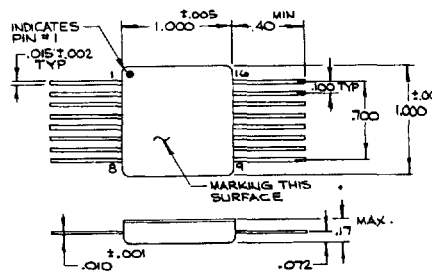
CO-464V
CO-467V



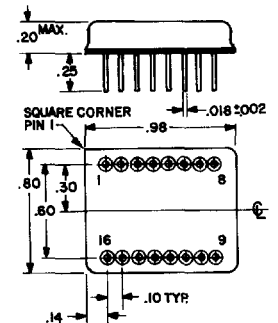
Features

- 8 MHz to 200 MHz
- -3.3 V operation
- Low Profile 16 Pin DIP or 16 pin flatpack
- PECL available
- 3 Point Mount Crystal

CO-467V



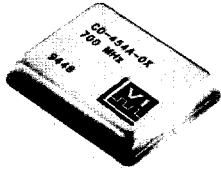
CO-464V



Note: dimensions in inches

TTL/CMOS/HCMOS/ACMOS Voltage Controlled Crystal Oscillators

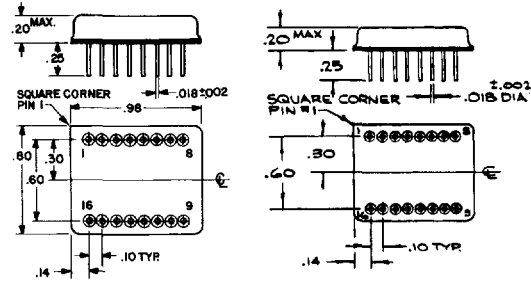
CO-434V/454V CO-434VH/454VH



Features

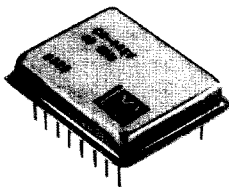
- Frequencies from 8 MHz to 640 MHz
- Low Profile 16 Pin and 24 Pin Double DIP
- 10K, 10 KH, 100K, ECLinPS, 10K/EL and 100E/EL Logic

CO-434V/454V (8 MHz to 200 MHz) CO-434VH/454VH (200 MHz to 640 MHz)



Note: dimensions in inches

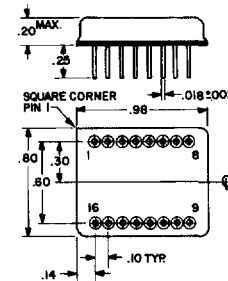
CO-445V



Features

- 100 kHz to 50 MHz Frequency Range
- Low Profile 16 Pin Double DIP
- HCMOS Compatible
- Deviation to ± 500 ppm

CO-445V



Note: dimensions in inches

SPECIFICATIONS

	HCMOS	TTL/HCMOS/ACMOS	ECL																																																																																																												
Series	CO-445V 16 pin Double DIP <i>Very wide deviation</i>	(a) CO-401V 4 Pin Dip (a) CO-402V 14 Pin Dip (b) CO-441V: 4 Pin Dip (b) CO-442V: 14 Pin Dip	(a) CO-434V: 16 pin DDIP (b) CO-434VH: 24 pin DDIP (a) CO-437V: 16 pin Flatpack	(a) CO-454V: 16 pin DDIP (b) CO-454VH: 24 pin DDIP (a) CO-464V: 16 pin DDIP (a) CO-467V: 16 pin flatpack																																																																																																											
Center Frequency	100 kHz to 50 MHz	(a) 32 kHz-75 MHz (b) 64 kHz-75 MHz	(a) 8-200 MHz (b) 200.1-640 MHz	(a) 8-200 MHz (b) 200.1-640 MHz																																																																																																											
Output Level	HCMOS, drives 3 TTL loads	(a) TTL (b) HCMOS/ACMOS	10K, 10KH, MECLIII, ECLinPS 10E or 10EL Complementary output is standard in CO-434VH and CO-454VH, optional in other models	100K ECLinPS, 100E or 100 EL																																																																																																											
Supply ($\pm 5\%$)	+5 Vdc, <25 mA	+5 Vdc at 20-60 mA, depending on frequency	-5.2 Vdc	-4.5 Vdc -3.3 Vdc																																																																																																											
Deviation/ Stability Alternatives	<table border="1"> <thead> <tr> <th>Code</th> <th>Range</th> <th>Temperature Stab. at fo</th> <th>Deviation Range</th> </tr> </thead> <tbody> <tr><td>EB35</td><td>0/+50°C</td><td>± 30 ppm</td><td>± 250 ppm</td></tr> <tr><td>FB55</td><td>0/+50°C</td><td>± 50 ppm</td><td>± 500 ppm</td></tr> <tr><td>EC45</td><td>0/+70°C</td><td>± 40 ppm</td><td>± 250 ppm</td></tr> <tr><td>FC65</td><td>0/+70°C</td><td>± 60 ppm</td><td>± 500 ppm</td></tr> <tr><td>ED45</td><td>-20/+70°C</td><td>± 40 ppm</td><td>± 250 ppm</td></tr> <tr><td>FD65</td><td>-20/+70°C</td><td>± 60 ppm</td><td>± 500 ppm</td></tr> <tr><td>EE55</td><td>-40/+85°C</td><td>± 50 ppm</td><td>± 250 ppm</td></tr> <tr><td>FE75</td><td>-40/+85°C</td><td>± 70 ppm</td><td>± 500 ppm</td></tr> <tr><td>EF55</td><td>-55/+85°C</td><td>± 50 ppm</td><td>± 250 ppm</td></tr> <tr><td>FF85</td><td>-55/+85°C</td><td>± 80 ppm</td><td>± 500 ppm</td></tr> </tbody> </table> <p>Aging rate: 3-5 ppm per year Size: 0.8" x 1.0" x 0.38". 16 pin double DIP NOTE: When internal multiplication is used (generally above 25 MHz) sub-harmonic suppression is >-30 dBc.</p>	Code	Range	Temperature Stab. at fo	Deviation Range	EB35	0/+50°C	± 30 ppm	± 250 ppm	FB55	0/+50°C	± 50 ppm	± 500 ppm	EC45	0/+70°C	± 40 ppm	± 250 ppm	FC65	0/+70°C	± 60 ppm	± 500 ppm	ED45	-20/+70°C	± 40 ppm	± 250 ppm	FD65	-20/+70°C	± 60 ppm	± 500 ppm	EE55	-40/+85°C	± 50 ppm	± 250 ppm	FE75	-40/+85°C	± 70 ppm	± 500 ppm	EF55	-55/+85°C	± 50 ppm	± 250 ppm	FF85	-55/+85°C	± 80 ppm	± 500 ppm	<table border="1"> <thead> <tr> <th>Code</th> <th>Temperature Range</th> <th>Temperature Stability</th> <th>*Minimum Deviation</th> </tr> </thead> <tbody> <tr><td>O</td><td>0/+50°C</td><td>± 10 ppm</td><td>± 30 ppm</td></tr> <tr><td>A</td><td>0/+50°C</td><td>± 20 ppm</td><td>± 50 ppm</td></tr> <tr><td>B</td><td>0/+50°C</td><td>± 35 ppm</td><td>± 100 ppm</td></tr> <tr><td>C**</td><td>0/+50°C</td><td>± 35 ppm</td><td>± 200 ppm</td></tr> <tr><td>D</td><td>0/+70°C</td><td>± 20 ppm</td><td>± 40 ppm</td></tr> <tr><td>E</td><td>0/+70°C</td><td>± 40 ppm</td><td>± 100 ppm</td></tr> <tr><td>F**</td><td>0/+70°C</td><td>± 40 ppm</td><td>± 200 ppm</td></tr> <tr><td>G</td><td>-20/+70°C</td><td>± 30 ppm</td><td>± 60 ppm</td></tr> <tr><td>H</td><td>-20/+70°C</td><td>± 40 ppm</td><td>± 100 ppm</td></tr> <tr><td>I**</td><td>-20/+70°C</td><td>± 40 ppm</td><td>± 200 ppm</td></tr> <tr><td>J</td><td>-40/+85°C</td><td>± 40 ppm</td><td>± 60 ppm</td></tr> <tr><td>K</td><td>-40/+85°C</td><td>± 50 ppm</td><td>± 100 ppm</td></tr> <tr><td>L**</td><td>-40/+85°C</td><td>± 50 ppm</td><td>± 200 ppm</td></tr> <tr><td>M</td><td>-55/+85°C</td><td>± 50 ppm</td><td>± 100 ppm</td></tr> <tr><td>N**</td><td>-55/+85°C</td><td>± 50 ppm</td><td>± 200 ppm</td></tr> </tbody> </table>	Code	Temperature Range	Temperature Stability	*Minimum Deviation	O	0/+50°C	± 10 ppm	± 30 ppm	A	0/+50°C	± 20 ppm	± 50 ppm	B	0/+50°C	± 35 ppm	± 100 ppm	C**	0/+50°C	± 35 ppm	± 200 ppm	D	0/+70°C	± 20 ppm	± 40 ppm	E	0/+70°C	± 40 ppm	± 100 ppm	F**	0/+70°C	± 40 ppm	± 200 ppm	G	-20/+70°C	± 30 ppm	± 60 ppm	H	-20/+70°C	± 40 ppm	± 100 ppm	I**	-20/+70°C	± 40 ppm	± 200 ppm	J	-40/+85°C	± 40 ppm	± 60 ppm	K	-40/+85°C	± 50 ppm	± 100 ppm	L**	-40/+85°C	± 50 ppm	± 200 ppm	M	-55/+85°C	± 50 ppm	± 100 ppm	N**	-55/+85°C	± 50 ppm	± 200 ppm	<p>* Deviation is referenced to the specified output frequency. For example, in Model CO-441V-BX at 10 MHz, at 25°C and 0V control the frequency is at least 100 ppm below 10 MHz and at -5V the frequency is at least 100 ppm above 10 MHz.</p> <p>** The following notes apply to options C, F, I, L, and N (± 200 ppm deviation) They are only available at frequencies up to 25 MHz for HCMOS/ACMOS and 75 MHz for ECL. Linearity of $\pm 10\%$ is standard. ($\pm 5\%$ and $\pm 2\%$ optional for HCMOS and ACMOS models) CO-464V and CO-467V not available on all codes. Contact factory for availability.</p>
Code	Range	Temperature Stab. at fo	Deviation Range																																																																																																												
EB35	0/+50°C	± 30 ppm	± 250 ppm																																																																																																												
FB55	0/+50°C	± 50 ppm	± 500 ppm																																																																																																												
EC45	0/+70°C	± 40 ppm	± 250 ppm																																																																																																												
FC65	0/+70°C	± 60 ppm	± 500 ppm																																																																																																												
ED45	-20/+70°C	± 40 ppm	± 250 ppm																																																																																																												
FD65	-20/+70°C	± 60 ppm	± 500 ppm																																																																																																												
EE55	-40/+85°C	± 50 ppm	± 250 ppm																																																																																																												
FE75	-40/+85°C	± 70 ppm	± 500 ppm																																																																																																												
EF55	-55/+85°C	± 50 ppm	± 250 ppm																																																																																																												
FF85	-55/+85°C	± 80 ppm	± 500 ppm																																																																																																												
Code	Temperature Range	Temperature Stability	*Minimum Deviation																																																																																																												
O	0/+50°C	± 10 ppm	± 30 ppm																																																																																																												
A	0/+50°C	± 20 ppm	± 50 ppm																																																																																																												
B	0/+50°C	± 35 ppm	± 100 ppm																																																																																																												
C**	0/+50°C	± 35 ppm	± 200 ppm																																																																																																												
D	0/+70°C	± 20 ppm	± 40 ppm																																																																																																												
E	0/+70°C	± 40 ppm	± 100 ppm																																																																																																												
F**	0/+70°C	± 40 ppm	± 200 ppm																																																																																																												
G	-20/+70°C	± 30 ppm	± 60 ppm																																																																																																												
H	-20/+70°C	± 40 ppm	± 100 ppm																																																																																																												
I**	-20/+70°C	± 40 ppm	± 200 ppm																																																																																																												
J	-40/+85°C	± 40 ppm	± 60 ppm																																																																																																												
K	-40/+85°C	± 50 ppm	± 100 ppm																																																																																																												
L**	-40/+85°C	± 50 ppm	± 200 ppm																																																																																																												
M	-55/+85°C	± 50 ppm	± 100 ppm																																																																																																												
N**	-55/+85°C	± 50 ppm	± 200 ppm																																																																																																												
Control Voltage and Linearity	0 to +5 Vdc Positive transfer (lowest frequency at 0V) $\pm 20\%$ linearity smooth monotonic characteristic ($\pm 10\%$ linearity available)	CO-40 and 44 series 0 to +5V; positive transfer function; CO-43 and 45 series: 0 to -5V negative transfer; CO-46 series: 0 to -3.3V negative transfer (lowest frequency at 0V) $\pm 20\%$ linearity is standard, ($\pm 10\%$ optionally available standard for C, F, I, L, and N deviation codes). $\pm 5V$ bipolar control voltage is optional ($\pm 3V$ to $\pm 10V$ available) With Bipolar, transfer function is negative, standard linearity is $\pm 10\%$																																																																																																													
Modulation Rate	0 to 1 kHz (Higher modulation rates available)	dc to 1 kHz; higher modulation rates optional																																																																																																													
Modulation Input Z	Greater than 50 k Ω	Greater than 50 k Ω																																																																																																													
Aging Rate	3-5 ppm first year, then 2 ppm/year thereafter—less than 20 ppm total over 10 years.																																																																																																														