

SECTION 1.3

**VOLTAGE CONTROLLED CRYSTAL
OSCILLATORS**

VOLTAGE CONTROLLED OSCILLATORS (VCXO)

INTRODUCTION

1. Application and Technology Notes:

Voltage Controlled Crystal Oscillators (VCXO) are produced in frequencies from 1 up to 800 MHz. Tri-state output, tight pulling linearity and wide pulling range are a few of the many features available. Hermetically sealed quartz units mounted on a printed circuit board is the preferred assembly method on all but the very simplest devices.

The SMD VCXO series feature the S1, S7 and S8 allowing most specifications for data and transmissions type applications to come in Surface Mountable packaging.

The VCXO is well suited for applications where long-term reliability, phase noise/jitter and frequency pullability are needed. Examples include telecommunication transmission systems and systems using PLL for reaching higher frequency bandwidths such as SDH/Sonet and ATM applications.

2. Code definition

DFV Φ - Φ 155.520 MHz

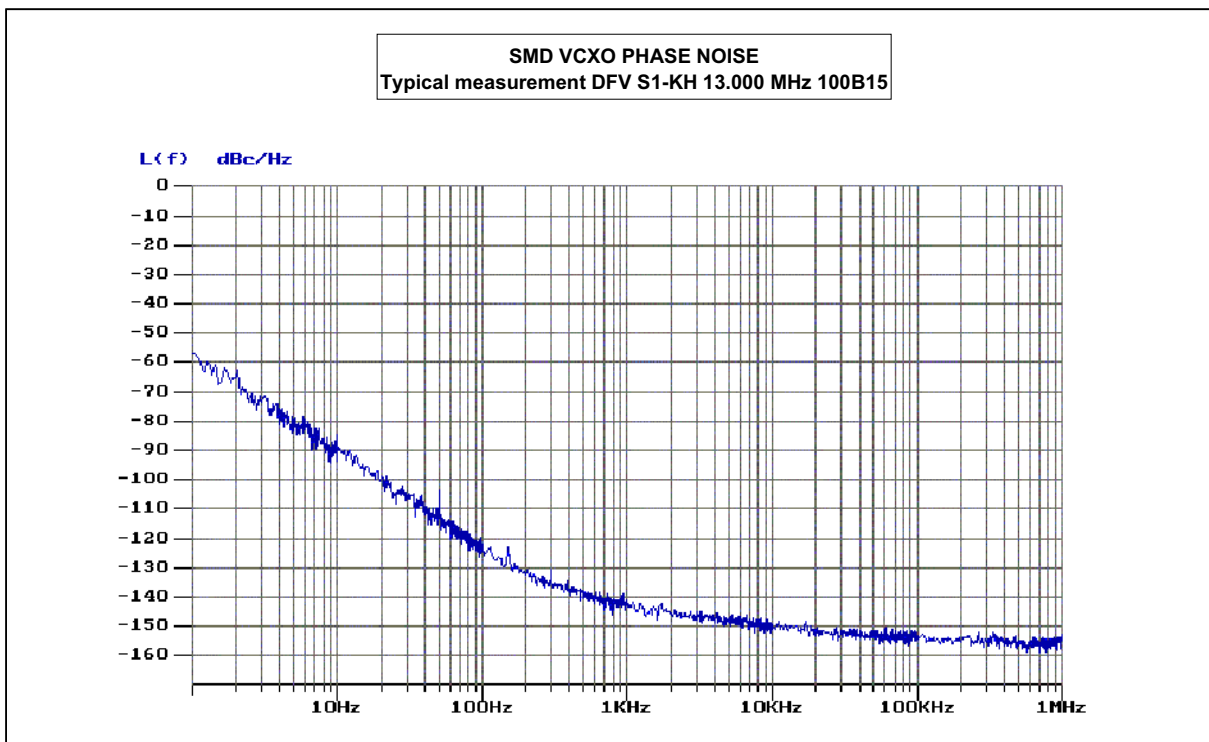
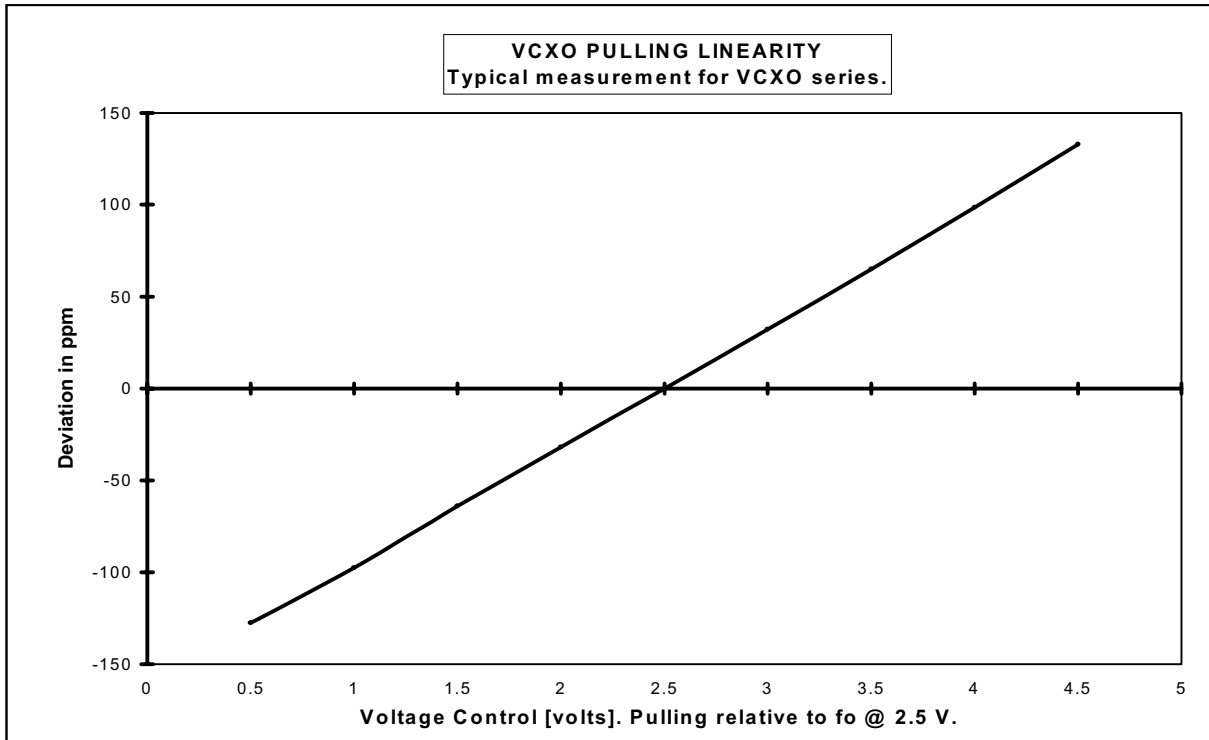
	Package Code [L x W x H mm]	Output Code	Option Code	Pulling [$\geq \pm$]	Control Voltage	Temperature Code	Stability [$\leq \pm$ ppm]
SURFACE MOUNT	S1 = 15 x 9 x 6	B = H and T	P = compl. output pin	100	void = spec std.	A = 0 to 50°C	10
	S2 = 8.2 x 5 x H	H = HCMOS	R = tight symmetry	150	A = 2.5 \pm 2.0 V	B = 0 to 70°C	12
	S5 = 14 x 9 x H	T = TTL	Z = tri-state output	200	C = 0.5 to 10 V	D = -10 to 60°C	15
	S7 = 20 x 13 x H	EC = PECL 10KH or 100 K	Z5 = tri-state on pin 5	250	D = 1.65 \pm 1.35 V	I = -10 to 70°C	20
	S8 = 20 x 13 x H	LEC = LVPECL 100K	I = enable / disable	500		C = -20 to 70°C	25
	LEADED	S11 = 7.5 x 5 x H	O = square wave AC coupled				E = -40 to 85°C
		S = sine wave					50
14 = DIL 14 x H							75

Some codes/options are product specific. Other codes/options also available. Please consult factory for details.
 Φ Internal codes for production use only. * A unique specification will be issued for custom requirements.

3. Detailed Specifications

Package	Description	Page No.
SMD	HCMOS, Tri-state, +3.3 or +5.0 V supply	27 - 31
	PECL, enable/disable, +3.3 or 5.0 V supply	32
	HCMOS, 40-130 MHz, +3.3 or +5.0 V supply	33
	PECL or clipped square wave, 40-800 MHz, +3.3 or +5.0 V supply	34 - 35 , 37
	Sine wave, 16-160 MHz, +5.0V supply	36
DIL 14	HCMOS , $\geq \pm$ 150 ppm pulling, +5.0 V supply	38
	HCMOS , $\geq \pm$ 200 ppm pulling, +3.3V supply	39
	HCMOS 1 to 90 MHz, $\geq \pm$ 500 ppm, + 5.0 V supply	40
	PECL or clipped Square wave, 30-260 MHz, +3.3 or + 5.0 V supply	41 - 42

**VOLTAGE CONTROLLED OSCILLATORS (VCXO)
TYPICAL MEASUREMENTS**

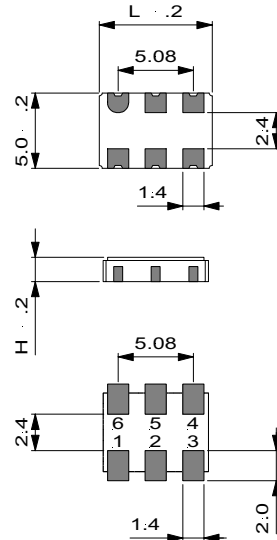


LOW COST CERAMIC SMD VCXO
DFV S11-HZ (5 V) & DFV S11-LHZ (3.3 V)

5 V OR 3.3 V SUPPLY VOLTAGE

LOW PROFILE PACKAGE

WIDE PULLING RANGE



L	7.5 mm
H	1.8 mm

Function	DFV S11
V control	1
Enable or N/C	2
GND	3
Output	4
N/C or Enable	5
Vcc	6

PC board footprint

TYPE	DFV S11-HZ	DFV S11-LHZ
FREQUENCY RANGE	1.6 to 52 MHz	1.6 to 52 MHz

ELECTRICAL SPECIFICATIONS		
supply voltage	5 V ± 5 %	3.3 V ± 5 %
supply current (no load)	≤ 35 mA	≤ 25 mA
output load (HCMOS)	15 pF	15 pF
duty cycle	40/60...60/40 % @ 50% level	40/60...60/40 % @ 50% level
rise/fall times (@ 15 pF load)	10 to 90 % : ≤ 10 ns	10 to 90 % : ≤ 10 ns
high/low levels	≥ 4.5 V / ≤ 0.5 V	≥ 2.7 V / ≤ 0.4 V
tri-state control (pin 2, pin 5 N/C)	high or open = enable, low = high Z	high or open = enable, low = high Z
start up	≤ 10 ms @ 4.75 V	≤ 10 ms @ 3.15 V

FREQUENCY STABILITY			tolerances [ppm]			
Type	temperature range	model code	overall stability	pulling range	function	control voltage
DFV S11-HZ	0 to 70°	80XB30	≤ ± 30	≥ ± 80	positive	2.5 ± 2 V
		80XB50	≤ ± 50			
		100XB50	≤ ± 50	≥ ± 100		
DFV S11-LHZ	-40 to 85°C	100XE50	≤ ± 50	≥ ± 80		1.65 ± 1.35 V
		80XB30	≤ ± 30			
		80XB50	≤ ± 50	≥ ± 100		
		100XB50	≤ ± 50			
Remarks	input impedance ≥ 10 kΩ					
	includes 25°C at calibration, temperature, ageing, Vcc and load changes					
	ageing is 1 st year at 25°C					

OPTIONS	CODE	
tight symmetry	R	45/55...55/45 %
tri-state control option on pin 5	Z5	high or open = enable, low = high Z (pin 2 N/C)

ORDERING CODE	type + option code + frequency + model code
Example	DFV S11-LHZ 16.384 MHz 80XB30

IMPORTANT NOTE THIS PRODUCT IS DESIGNED FOR VOLUME APPLICATION ONLY

MINIATURE SURFACE MOUNT VCXO

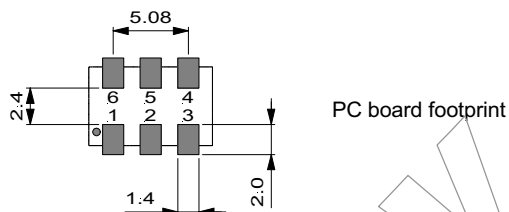
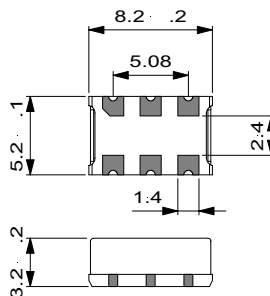
DFV S2-KHZ (5 V) & DFV S2-LHZ (3.3 V)

CRYSTAL PACKED INTO ITS OWN HOLDER

SURFACE MOUNTABLE EPOXY PACKAGE

5 V OR 3.3 V SUPPLY VOLTAGE

TIGHT OVERALL STABILITIES



Function	DFV S2
V control	1
Enable or N/C	2
GND	3
Output	4
N/C or Enable	5
Vcc	6

TYPE	DFV S2-KHZ	DFV S2-LHZ
FREQUENCY RANGE	2 to 50 MHz	2 to 50 MHz

ELECTRICAL SPECIFICATIONS		DFV S2-KHZ	DFV S2-LHZ
supply voltage		5 V ± 5 %	3.3 V ± 5 %
supply current (no load)	≤ 25 MHz	≤ 15 mA	≤ 10 mA
	> 25 MHz	≤ 35 mA	≤ 25 mA
output load (HCMOS)		25 pF up to 25 MHz, 15 pF above	15 pF
duty cycle		45/55...55/45 % @ 50% level	45/55...55/45 % @ 50% level
rise/fall times (@ 15 pF load)		10 to 90 % : ≤ 5 ns	10 to 90 % : ≤ 5 ns
high/low levels		≥ 4.5 V / ≤ 0.5 V	≥ 2.8 V / ≤ 0.3 V
tri-state control (pin 2) (pin 5 N/C)		high or open = enable, low = high Z	high or open = enable, low = high Z
start up		≤ 10 ms @ 4.75 V	≤ 10 ms @ 3.15 V

FREQUENCY STABILITY			tolerances [ppm]			
type	temperature range	model code	overall stability	pulling range	function	control voltage
DFV S2-KHZ	0 to 70°C	100XB20	≤ ± 20	≥ ± 100	positive	2.5 ± 2.5 V
		100XB25	≤ ± 25	≥ ± 100		
	-40 to 85°C	100XE50	≤ ± 50			
DFV S2-LHZ	0 to 70°C	90XB20	≤ ± 20	≥ ± 90	positive	1.65 ± 1.65 V
		90XB25	≤ ± 25			
	-40 to 85°C	90XE50	≤ ± 50			
remarks	input impedance ≥ 10 kΩ includes calibration @ 25°C, temperature, ageing, Vcc and load changes ageing is 1 st year at 25°C					

OPTIONS	CODE	
tri-state control on	Z5	high or open = enable, low = high Z (pin 2 N/C)

ORDERING CODE	type + option code + frequency + model code
Example	DFV S2-LHZ 34.368 MHz 90XB20

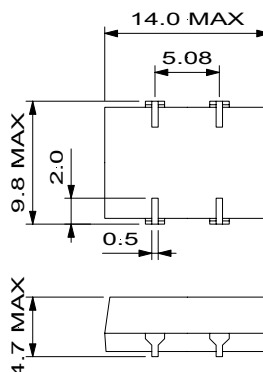
REMARK	Preliminary data sheet subject to change without notice
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LOW COST PLASTIC SMD VCXO
DFV S5-KH (5 V) & DFV S5-LH (3.3 V)

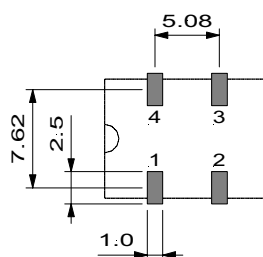
5 V OR 3.3 V SUPPLY VOLTAGE

PLASTIC MOLDED PACKAGE

LOW COST MODEL



Function	DFV S5
V control	1
GND	2
Output	3
Vcc	4



PC board footprint

TYPE	DFV S5-KH	DFV S5-LH
FREQUENCY RANGE	1.6 to 33 MHz	1.6 to 33 MHz

ELECTRICAL SPECIFICATIONS	DFV S5-KH	DFV S5-LH
supply voltage	5 V ± 5 %	3.3 V ± 5 %
supply current (no load)	≤ 50 mA	≤ 35 mA
output load (HCMOS)	15 pF	15 pF
duty cycle	40/60...60/40 % @ 50% level	40/60...60/40 % @ 50% level
rise/fall times (@ 15 pF load)	20 to 80 % : ≤ 8 ns	20 to 80 % : ≤ 8 ns
high/low levels	≥ 4.5 V / ≤ 0.5 V	≥ 2.7 V / ≤ 0.4 V
start up	≤ 6 ms @ 4.75 V	≤ 6 ms @ 3.15 V

FREQUENCY STABILITY			tolerances [ppm]				
type	temperature range	model code	overall stability	pulling range	function	control voltage	
DFV S5-KH	0 to 70°C	80XB50	≤ ± 50	≥ ± 80	positive	2.5 ± 2 V	
		100XB50	≤ ± 50	≥ ± 100			
	-40 to 85°C	100XE50	≤ ± 50				
DFV S5-LH	0 to 70°C	80XB50	≤ ± 50	≥ ± 80		1.65 ± 1.35 V	
		100XB50	≤ ± 50	≥ ± 100			
	-40 to 85°C	100XE50	≤ ± 50				
remarks			input impedance ≥ 10 kΩ				
			includes 25°C at calibration, temperature, ageing, Vcc and load changes				
			ageing is 1 st year at 25°C				

OPTIONS	CODE
tight symmetry	R
	45/55...55/45 %

ORDERING CODE	type + option code + frequency + model code
Example	DFV S5-LH 24.576 MHz 100XB50

IMPORTANT NOTE THIS PRODUCT IS DESIGNED FOR VOLUME APPLICATION ONLY

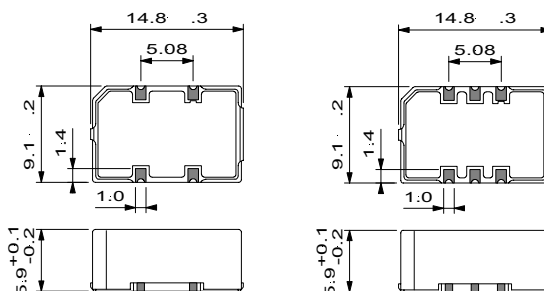
LOW POWER MINIATURE SMD VCXO DFV S1-LH/LHZ (3.3 V)

RECOMMENDED FOR NEW DESIGNS

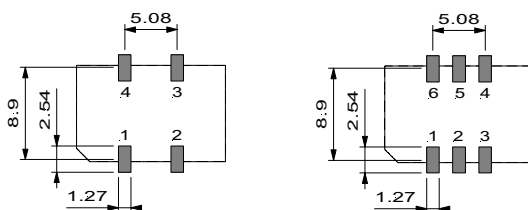
CRYSTAL PACKED INTO ITS OWN HOLDER

SURFACE MOUNTABLE EPOXY PACKAGE

HIGH FREQUENCIES



Function	DFV S1-LH	DFV S1-LHZ
V control	1	1
Enable	N/A	2
GND	2	3
Output	3	4
NC	N/A	5
Vcc	4	6



PC board footprint

TYPE	DFV S1-LH/LHZ
Frequency Range	2 to 130 MHz

ELECTRICAL SPECIFICATIONS	
supply voltage	3.3 V ± 5 %
supply current (no load)	≤ 25 MHz ≤ 10 mA ≤ 50 MHz ≤ 20 mA > 50 MHz ≤ 40 mA
output load (HCMOS)	25 pF up to 25 MHz, 15 pF above
duty cycle	≤ 50 MHz 45/55...55/45 % @ 50% level > 50 MHz 40/60...60/40 % @ 50% level
rise/fall times (@ 15 pF load)	10 to 90 % : ≤ 10 ns up to 25 MHz : ≤ 3 ns > 25 MHz
high/low levels	≥ 2.8 V / ≤ 0.3 V
start up	≤ 10 ms @ 3.15V

FREQUENCY STABILITY			detailed tolerances [ppm]						
type	temperature range	model code	stability versus:				pulling range positive function	control voltage	
			temp.	@ 25°C	Vcc	load			ageing
DFV S1-L	0 to 70°C	100B15	≤ ± 15	≤ ± 10	≤ ± 3	≤ ± 0.5	≤ ± 2	≥ ± 100	1.5 V ± 1.5 V
		100B25	≤ ± 25						
	-40 to 85°C	100E25	≤ ± 25						
		100E50	≤ ± 50						
remarks			input impedance ≥ 10 kΩ, modulation bandwidth ≥ 10 kHz @ -3dB ageing is 1 st year at 25°C f max = 80 MHz for -40 to +85°C versions						

OPTIONS	CODE	
control voltage	D	0.3 to 3.0 V, center @ 1.65 V (code placed into the model code : 100"D"B25)
tri-state control on pin 2	Z	high or open = enable, low = disable (6 pad package)

ORDERING CODE	type + option code + frequency + model code
Example	DFV S1-LH 16.384 MHz 100B15

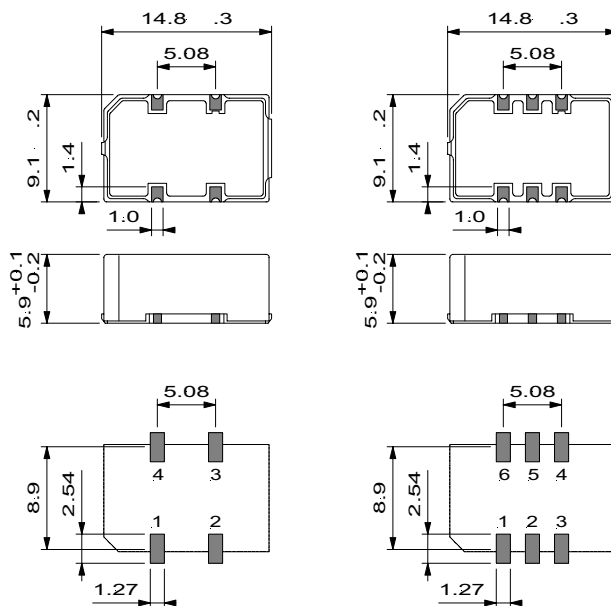
LOW POWER MINIATURE SMD VCXO
DFV S1-KH/KHZ (5.0 V)

RECOMMENDED FOR NEW DESIGNS

CRYSTAL PACKED INTO ITS OWN HOLDER

SURFACE MOUNTABLE EPOXY PACKAGE

HIGH FREQUENCIES



PC board footprint

Function	DFV S1-KH	DFV S1-KHZ
V control	1	1
Enable	N/A	2
GND	2	3
Output	3	4
NC	N/A	5
Vcc	4	6

TYPE	DFV S1-KH/KHZ
Frequency Range	1 to 100 MHz

ELECTRICAL SPECIFICATIONS	
supply voltage	5 V ± 5 %
supply current (no load)	≤ 25 MHz ≤ 10 mA (KH), ≤ 20 mA (KHZ) ≤ 50 MHz ≤ 40 mA > 50 MHz ≤ 60 mA
output load (HCMOS) duty cycle	50 pF up to 25 MHz, 15 pF above 40/60...60/40 % @ 50% level
rise/fall times (@ 15 pF load) high/low levels	10 to 90 % : ≤ 10 ns ≥ 4.5 V / ≤ 0.5 V
start up	≤ 10 ms @ 4.75 V

FREQUENCY STABILITY			detailed tolerances [ppm]						
type	temperature range	model code	stability versus:				pulling range positive function	control voltage	
			temp.	@ 25°C	Vcc	load			ageing
DFV S1-K	0 to 70°C	100B15	≤ ± 15	≤ ± 10	≤ ± 3	≤ ± 0.5	≤ ± 2	≥ ± 100	2.5 V ± 2 V
		100B25	≤ ± 25						
	-40 to 85°C	100E25	≤ ± 25						
		100E50	≤ ± 50						
remarks			input impedance ≥ 10 kΩ, modulation bandwidth ≥ 10 kHz @ -3dB ageing is 1 st year at 25°C						

OPTIONS	CODE	
tighter symmetry (f ≤ 45 MHz)	R	45/55...55/45 %
tri-state control on pin 2	Z	high or open = enable, low = disable (6 pad package)

ORDERING CODE	type + option code + frequency + model code
Example	DFV S1-KH 16.384 MHz 100B15

HIGH FREQUENCY SURFACE MOUNT VCXO

DFV S1-KECPI (5 V) & DFV S1-LECPI (3.3 V)

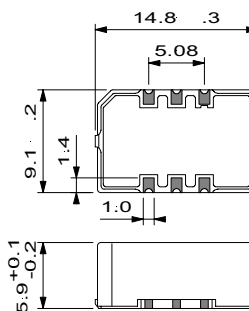
RECOMMENDED FOR NEW DESIGNS

CRYSTAL PACKED INTO ITS OWN HOLDER

3.3 V OR 5.0 V SUPPLY VOLTAGE

VERY LOW JITTER

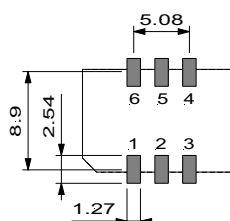
HIGH FREQUENCIES



Marking:

DFV S1-KE/LE
Frequency
Code yrwk

Function	DFV S1
V control	1
E / D	2
GND	3
Output 1	4
Output 2	5
Vcc	6



PC board footprint

TYPE	DFV S1-KECPI	DFV S1-LECPI
Frequency Range	16 to 180 MHz	16 to 180 MHz

ELECTRICAL SPECIFICATIONS	DFV S1-KECPI	DFV S1-LECPI
supply voltage	5 V ± 5 %	3.3 V ± 5 %
supply current (no load)	≤ 70 mA	≤ 60 mA
output load	PECL 100 K (50 Ω to 3 V)	PECL 100 K (50 Ω to 1.3 V)
duty cycle @ 50% level	40/60...60/40 %	40/60...60/40 %
rise/fall times (20 to 80%)	≤ 0.5 ns	≤ 0.5 ns
high/low levels	≥ 3.92 V / ≤ 3.45 V	≥ 2.22 V / ≤ 1.7 V
jitter RMS (12 kHz to 5 MHz)	≤ 0.5 ps	≤ 0.5 ps
enable / disable on pin 2	low or open = enable, high = disable	low or open = enable, high = disable
complementary output on pin 5	180° phase shifted	180° phase shifted
start up	≤ 10 ms @ 4.75 V	≤ 10 ms @ 3.15 V

FREQUENCY STABILITY			detailed tolerances [ppm]						
type	temperature range	model code	stability versus:				pulling range positive function	control voltage	
			temp.	@ 25°C	Vcc	load			ageing
DFV S1-K	0 to 70°C	100B15	≤ ± 15	≤ ± 10	≤ ± 3	≤ ± 0.5	≤ ± 2	≥ ± 100	2.5 V ± 2 V
		100B25	≤ ± 25						
DFV S1-L	0 to 70°C	100B15	≤ ± 15	≤ ± 10	≤ ± 3	≤ ± 0.5	≤ ± 2	≥ ± 100	1.5 V ± 1.5 V
		100B25	≤ ± 25						
remarks			input impedance ≥ 10 kΩ, modulation bandwidth ≥ 10 kHz @ -3dB ageing is 1 st year at 25°C						

OPTIONS	CODE
control voltage	D

0.3 to 3.0 V, center @ 1.65 V (code placed into the model code : 100"D"B25)

ORDERING CODE	type + option code + frequency + model code
Example	DFV S1-KECPI 155.52 MHz 100B15

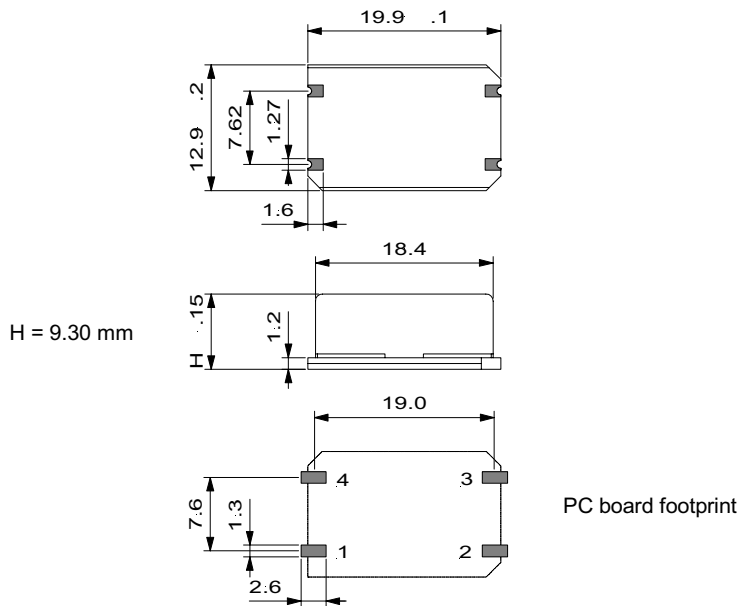
REMARK Please consult factory for -40 to +85°C versions

HIGH FREQUENCY SURFACE MOUNT VCXO DFV S7-MH (5 V) & DFV S7-MLH (3.3 V)

STANDARD MINIATURE SMD PACKAGE

STANDARD OUTPUT DRIVE CAPABILITY

WIDE PULLING RANGE



Function	DFV S7
V control	1
GND	2
Output	3
Vcc	4

TYPE	DFV S7-MH	DFV S7-MLH
Frequency Range	40 to 90 MHz	40 to 130 MHz

ELECTRICAL SPECIFICATIONS		DFV S7-MH	DFV S7-MLH
supply voltage		5 V ± 5 %	3.3 V ± 5 %
supply current (no load)		≤ 50 mA	≤ 50 mA
output load		HCMOS 15 pF	HCMOS 15 pF
duty cycle		40/60...60/40 % @ 50% level	40/60...60/40 % @ 50% level
rise/fall times (@ 15 pF load)		10 to 90 % : ≤ 5 ns	10 to 90 % : ≤ 5 ns
high/low levels		≥ 4.5 V / ≤ 0.5 V	≥ 2.8 V / ≤ 0.3 V
subharmonics and surious		≤ - 40 dBc	≤ - 40 dBc
start up		≤ 10 ms @ 4.75 V	≤ 10 ms @ 3.15 V

FREQUENCY STABILITY			detailed tolerances [ppm]						
type	temperature range	model code	stability versus :				pulling range positive function	control voltage	
			temp.	@ 25°C	Vcc	load			ageing
DFV S7- MH	0 to 70°C	100B15	≤ ± 15	≤ ± 10	≤ ± 3	≤ ± 0.5	≤ ± 2	≥ ± 100	2.5 V ± 2 V
		100B25	≤ ± 25						
	-40 to 85°C	100E25	≤ ± 25						
		100E50	≤ ± 50						
DFV S7- MLH	0 to 70°C	100B15	≤ ± 15	≤ ± 10	≤ ± 3	≤ ± 0.5	≤ ± 2	≥ ± 100	1.5 V ± 1.5 V
		100B25	≤ ± 25						
	-40 to 85°C	100E25	≤ ± 25						
		100E50	≤ ± 50						
remarks			input impedance ≥ 10 kΩ						
			modulation bandwidth ≥ 10 kHz @ -3dB						
			ageing is 1 st year at 25°C						

OPTIONS	CODE	
control voltage	D	0.3 to 3.0 V, center @ 1.65 V (code placed into the model code : 100"D"B25)
tighter symmetry (f ≤ 80 MHz)	R	45/55...55/45 %

ORDERING CODE	type + frequency + model code
Example	DFV S7-MH 77.760 MHz 100B15

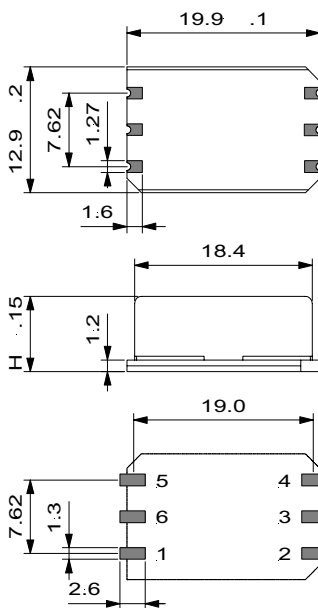
HIGH FREQUENCY SURFACE MOUNT VCXO DFV S7-MLECP (3.3 V)

HIGH FREQUENCY VCXO

CRYSTAL PACKED INTO ITS OWN HOLDER

3.3 V SUPPLY VOLTAGE

VERY LOW JITTER



H = 9.30 mm

Function	DFV S7
V control	1
GND	2
Output 2	3
Output 1	4
Vcc	5
NC	6

PC board footprint

TYPE	DFV S7-MLECP
Frequency Range	160 to 270 MHz

ELECTRICAL SPECIFICATIONS	
supply voltage	3.3 V ± 5 %
supply current (no load)	100 mA
output load	LAPECL 100 kΩ to 50 Ω to 1.3 V)
duty cycle @ 50% level	45/55...55/45 %
rise/fall times (20 to 80%)	≤ 0.5 ns
high/low levels	≥ 2.22 V / ≤ 1.7 V
jitter RMS (12 kHz to 5 MHz)	≤ 0.5 ps
complementary output on pin 3	180° phase shifted
start up	≤ 10 ms @ 3.15 V

FREQUENCY STABILITY		detailed tolerances [ppm]							
type	temperature range	model code	stability versus:					pulling range positive function	control voltage
			temp.	@ 25°C	Vcc	load	ageing		
DFV S7-MLECP	0 to 70°C	100B15	≤ ± 15	≤ ± 10	≤ ± 3	≤ ± 0.5	≤ ± 2	≥ ± 100	1.65 V ± 1.35 V
		100B25	≤ ± 25						
remarks		input impedance ≥ 10 kΩ, modulation bandwidth ≥ 10 kHz @ -3dB ageing is 1 st year at 25°C							

ORDERING CODE	type + option code + frequency + model code
Example	DFV S7-MLECP 200 MHz 100B15

REMARK	Please consult factory for -40 to +85°C versions Preliminary data sheet is subject to change without notice
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HIGH FREQUENCY SURFACE MOUNT VCXO DFV S7-MEC & DFV S7-MO

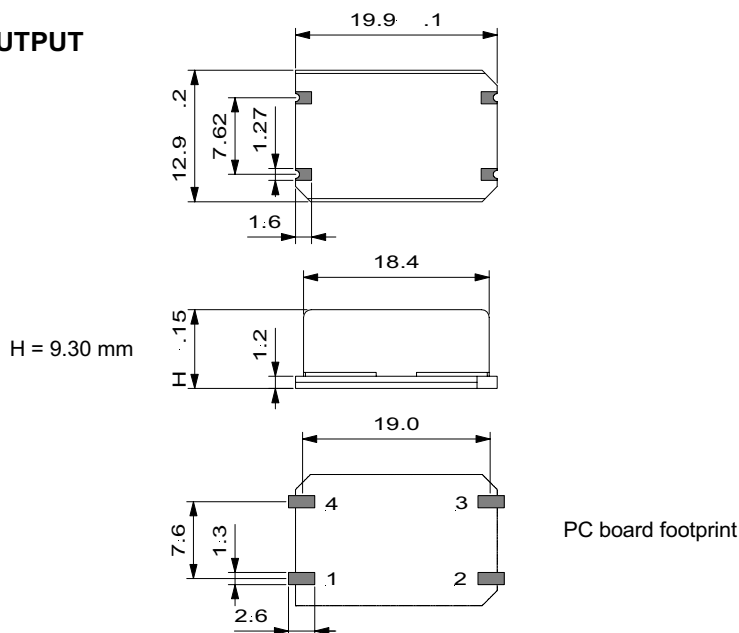
FAST PECL 10KH OR CLIPPED SINE WAVE OUTPUT

POSITIVE SUPPLY VOLTAGE

WIDE PULLING RANGE

HIGH FREQUENCIES

Function	DFV S7-MEC/O
V control	1
GND	2
Output	3
Vcc	4



TYPE	DFV S7-MEC	DFV S7-MO
Frequency Range	40 to 160 MHz	

ELECTRICAL SPECIFICATIONS	DFV S7-MEC	DFV S7-MO
supply voltage	5 V ± 5 %	5 V ± 5 %
supply current	≤ 50 mA	≤ 50 mA
output load	PECL 10 KH (50 Ω to 3 V)	50 Ω, square wave, AC coupled
duty cycle (PECL @ 50 % level)	40/60...60/40 %	40/60...60/40 % @ 0 V
rise/fall times (20 to 80 %)	≤ 2 ns	
high/low levels or output amplitude	≥ 3.97 V / ≤ 3.45 V	0 dBm ± 2 dB
start up	≤ 10 ms @ 4.75 V	≤ 10 ms @ 4.75 V

FREQUENCY STABILITY			detailed tolerances [ppm]						
type	temperature range	model code	stability versus :					pulling range positive function	control voltage
			temp.	@ 25°C	Vcc	load	ageing		
all types	0 to 70°C	100B15	≤ ± 15	≤ ± 10	≤ ± 2	≤ ± 1	≤ ± 2	≥ ± 100	2.5V ± 2 V
		100B25	≤ ± 25						
remarks			linearity ± 20 %						
			input impedance ≥ 10 kΩ						
			modulation bandwidth ≥ 10 kHz @ -3 dB						
			ageing is 1 st year at 25°C						

ORDERING CODE	type + frequency + temperature code
Example	DFV S7-MEC 155.520 MHz 100B15

HIGH FREQUENCY SMD SINE WAVE VCXO DFV S7-S / MS

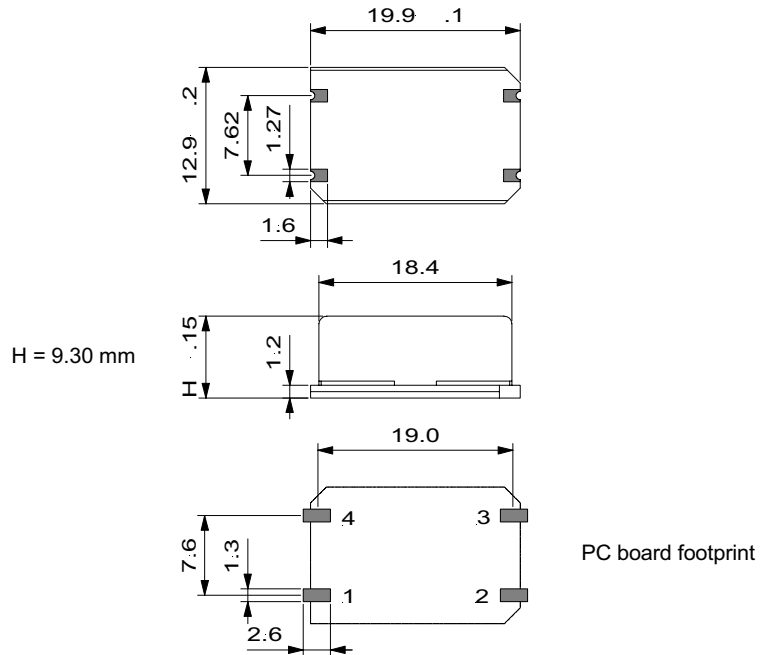
SURFACE MOUNT PACKAGE

SINE WAVE OUTPUT

WIDE PULLING RANGE

HIGH FREQUENCIES

Function	DFV S7-S/MS
V control	1
GND	2
Output	3
Vcc	4



TYPE	DFV S7-S	DFV S7-MS
Frequency Range	16 to 40 MHz	40 to 160 MHz

ELECTRICAL SPECIFICATIONS		
supply voltage	5 V ± 5 %	5 V ± 5 %
supply current (no load)	≤ 50 mA	≤ 50 mA
output load	Sine 50 Ω ± 10 %	Sine 50 Ω ± 10 %
output amplitude	≥ 0 dBm	≥ 0 dBm
subharmonics and spurious harmonics	≤ -20 dBc	≤ -40 dBc ≤ -20 dBc
start up	≤ 20 ms @ 4.75 V	≤ 20 ms @ 4.75 V

FREQUENCY STABILITY			detailed tolerances [ppm]						
type	temperature range	model code	stability versus :					pulling range positive function	control voltage
			temp.	@ 25°C	Vcc	load	ageing		
DFV S7-MS	0 to 70°C	100B15	≤ ± 15	≤ ± 10	≤ ± 3	≤ ± 1	≤ ± 2	≥ ± 100	2.5 V ± 2 V
		100B25	≤ ± 25						
	-40 to 85°C	100E25	≤ ± 25						
		100E50	≤ ± 50						
remarks			linearity ± 10% input impedance ≥ 10 kΩ modulation bandwidth ≥ 10 kHz @ -3 dB ageing is 1 st year at 25°C						

ORDERING CODE	type + frequency + temperature code
Example	DFV S7-MS 155.520 MHz 100B15

HIGH FREQUENCY SURFACE MOUNT VCXO DFV S8-MLECP (3.3 V)

RECOMMENDED FOR NEW DESIGNS

CRYSTAL PACKED INTO ITS OWN HOLDER

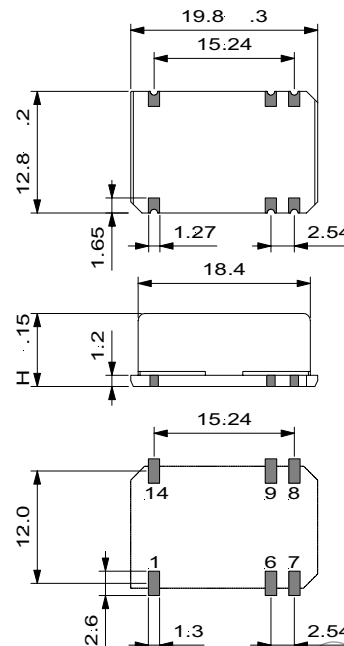
3.3 V SUPPLY VOLTAGE

VERY LOW JITTER

STANDARD FREQUENCIES

Function	DFV S8
V control	1
N / C	6
GND	7
Output 1	8
Output 2	9
Vcc	14

H = 9.30 mm



TYPE	DFV S8-MLECP
Frequency Range	622.08 to 800 MHz
Standard Frequencies	622.08, 644.5313 & 666.5143, 669.3216 and 693.4828 MHz

ELECTRICAL SPECIFICATIONS	
supply voltage	3.3 V ± 5%
supply current (no load)	± 20 mA
output load	LVPE: 100 k (50 Ω to 1.3 V)
duty cycle @ 50% level	55...55/45 %
rise/fall times (20 to 80%)	≤ 0.5 ns
high/low levels	≥ 2.22 V / ≤ 1.7 V
jitter RMS (12 kHz to 5 MHz)	≤ 0.5 ps
jitter RMS (50 kHz to 80 MHz)	≤ 3.0 ps
complementary output on pin 9	180° phase shifted
start up	≤ 10 ms @ 3.15 V

FREQUENCY STABILITY			detailed tolerances [ppm]						
type	temperature range	model code	temp.	stability versus:			pulling range positive function		control voltage
				@ 25°C	Vcc	load	ageing		
DFV S8-MLECP	-40 to 70°C	100B20	≤ ± 20	≤ ± 10	≤ ± 3	≤ ± 0.5	≤ ± 2	≥ ± 100	1.65 V ± 1.35 V
		100B25	≤ ± 25						
		100B50	≤ ± 50						
remarks	input impedance ≥ 10 kΩ, modulation bandwidth ≥ 10 kHz @ -3dB ageing is 1 st year at 25°C								

ORDERING CODE	type + option code + frequency + model code
Example	DFV S8-MLECP 622.08 MHz 100B20

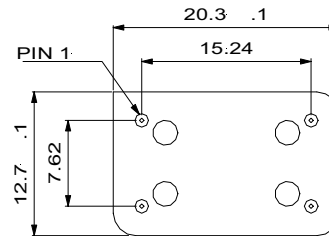
REMARK Preliminary data sheet is subject to change without notice

LOW VOLTAGE TIGHT SPECIFICATION DIL 14 VCXO
DFV 14-LH (3.3 V) & DFV 14-MLH (3.3 V)

CRYSTAL PACKED INTO ITS OWN HOLDER

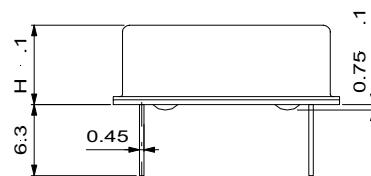
HIGH FREQUENCY STABILITY

3.3 V SUPPLY VOLTAGE



Function	DFV 14-LH / MLH
V control	1
GND	7
Output	8
Vcc	14

H = 7.0 mm (DFV 14-LH type)
H = 8.5 mm (DFV 14-MLH type)



TYPE	DFV 14-LH	DFV 14-MLH
Frequency Range	2 to 33 MHz	40 to 130 MHz

ELECTRICAL SPECIFICATIONS		
supply voltage	3.3 V ± 5 %	3.3 V ± 5 %
supply current (no load)	≤ 6 mA (F ≤ 25 MHz) ≤ 10 mA (F > 25 MHz)	≤ 50 mA
output load	HCMOS 25 pF (F ≤ 25 MHz) HCMOS 15 pF (F > 25 MHz)	HCMOS 15 pF
duty cycle	45/55...55/45 % @ 50% level	40/60...60/40 % @ 50% level
rise/fall times (@ 15 pF load)	10 to 90 % : ≤ 10 ns	10 to 90 % : ≤ 5 ns
high/low levels	≥ 2.8 V / ≤ 0.5 V	≥ 2.8 V / ≤ 0.5 V
subharmonics and serious		≤ - 40 dBc
start up	≤ 10 ms @ 3.15 V	≤ 10 ms @ 3.15 V

FREQUENCY STABILITY			detailed tolerances [ppm]						
type	temperature range	model code	stability versus :				pulling range positive function	control voltage	
			temp	@ 25°C	Vcc	load			ageing
DFV 14	0 to 70°C	100B15	≤ ± 15	≤ ± 10	≤ ± 3	≤ ± 0.5	≤ ± 2	1.5 V ± 1.5V	
		100B25	≤ ± 25						
		200B50	≤ ± 50	≤ ± 25	≤ ± 5				
	-20 to 70°C	100C20	≤ ± 20	≤ ± 10	≤ ± 3				
		100C30	≤ ± 30						
		200C50	≤ ± 50	≤ ± 25	≤ ± 5				
remarks			input impedance ≥ 10 kΩ						
			modulation bandwidth ≥ 10 kHz @ -3 dB						
			ageing is 1 st year at 25°C						

ORDERING CODE	type + frequency + model code
Example	DFV 14-LH 18.432 MHz 100B15

REMARK Please consult factory for frequencies above 33 MHz (DFV 14-LH)

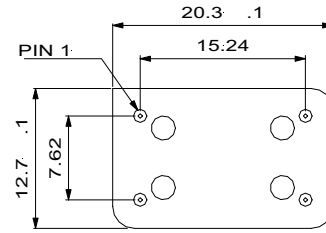
LOW POWER TIGHT SPECIFICATION DIL 14 VCXO

DFV 14-KH & DFV 14-MH

CRYSTAL PACKED INTO ITS OWN HOLDER

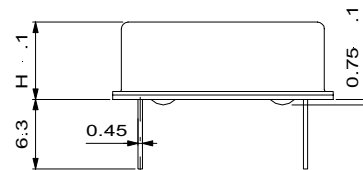
HIGH FREQUENCY STABILITY

WIDE PULLING OPTION



Function	DFV 14-KH/MH
V control	1
GND	7
Output	8
Vcc	14

H = 7.0 mm (DFV 14-KH type)
H = 8.5 mm (DFV 14-MH type)



TYPE	DFV 14-KH	DFV 14-MH
Frequency Range	1 to 40 MHz	40.1 to 90 MHz

ELECTRICAL SPECIFICATIONS	
supply voltage	5 V \pm 5 %
supply current (no load)	\leq 10 mA \leq 50 mA
output load (HCMOS) duty cycle	50 pF up to 25 MHz, 15 pF above 40/60...60/40 % @ 50% level 10 to 90 % : \leq 10 ns (KH types) : \leq 5 ns (MH types)
rise/fall times (@ 15 pF load)	
high/low levels	\geq 4.5 V / \leq 0.5 V
start up	\leq 10 ms @ 4.75 V

FREQUENCY STABILITY			detailed tolerances [ppm]											
type	temperature range	model code	stability versus :				pulling range positive function	control voltage						
			Temp.	@ 25°C	Vcc	load			ageing					
all types	0 to 70°C	100B10	$\leq \pm 10$	$\leq \pm 10$	$\leq \pm 3$	$\leq \pm 0.5$	$\leq \pm 2$	$\geq \pm 100$	0.5 to 5.0 V centred @ 2.5 V					
		100B15	$\leq \pm 15$											
		100B25	$\leq \pm 25$											
	-40 to 85°C	100E20	$\leq \pm 20$											
		100E25	$\leq \pm 25$											
		100E50	$\leq \pm 50$											
	0 to 70°C	250B25	$\leq \pm 25$					$\leq \pm 25$		$\leq \pm 5$	$\leq \pm 1$	$\leq \pm 2$	$\geq \pm 250$	2.5 V \pm 2.5 V
		500B50	$\leq \pm 50$										$\geq \pm 500$	
		250E75	$\leq \pm 75$										$\geq \pm 250$	
remarks	model code 100B10 available with DFV 14-KH only													
	input impedance \geq 10 k Ω													
	modulation bandwidth \geq 10 kHz @ -3 dB													
	ageing is 1 st year at 25°C													

OPTIONS	CODE	
tight symmetry	R	45/55...55/45 %
control voltage	A C	0.5 to 4.5 V, center @ 2.5 V (code placed into the model code : 100"A"B25) 0.5 V to 10 V, center @ 4.25 V (code placed into the model code : 250"C"B25)
high load output	DFV 14-K/MB	HCMOS 50 pF or 10 TTL, Icc \leq 20 mA up to 25 MHz, \leq 50 mA above

ORDERING CODE	type + option code + frequency + model code
Example	DFV 14-KHR 34.368 MHz 100E25

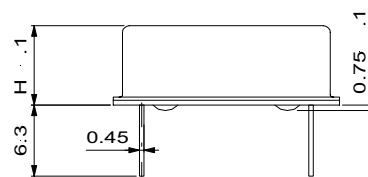
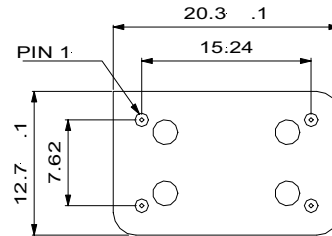
HIGH FREQUENCY DIL 14 VCXO DFV 14-KEC & DFV 14-KO

FAST ECL 10KH OR CLIPPED SQUARE WAVE OUTPUT

STANDARD DIL 14 PACKAGE

WIDE PULLING RANGE

HIGH FREQUENCIES



H = 8.50 mm

Pin	DFV 14-KEC/O
1	V control
7	GND
8	Output
14	Vcc

TYPE	DFV 14-KEC	DFV 14-KO
Frequency Range	30 to 160 MHz	30 to 160 MHz

ELECTRICAL SPECIFICATIONS	DFV 14-KEC	DFV 14-KO
supply voltage	5 V ± 5 %	5 V ± 5 %
supply current (no load)	≤ 50 mA	≤ 50 mA
output load	PECL 10 KH (50 Ω to 3 V)	50 Ω, square wave, AC coupled
duty cycle (ECL/PECL @ 50 % level)	40/60...60/40 %	40/60...60/40 % @ 0 V
rise/fall times (20 to 80 %)	≤ 2 ns	
high/low levels or output amplitude	≥ 3.97 V / ≤ 3.45 V	0 dBm ± 2 dB
start up	≤ 10 ms @ 4.75 V	≤ 10 ms @ 4.75 V

FREQUENCY STABILITY			detailed tolerances [ppm]						
type	temperature range	model code	stability versus :					pulling range positive function	control voltage
			temp.	@ 25°C	Vcc	load	ageing		
all types	0 to 70°C	100B15	≤ ± 15	≤ ± 10	≤ ± 2	≤ ± 1	≤ ± 2	≥ ± 100	2.5 V ± 2.5 V
		100B25	≤ ± 25						
remarks			input impedance ≥ 10 kΩ						
			modulation frequency ≥ 10 kHz @ -3 dB						
			ageing is 1 st year at 25°C						

ORDERING CODE	type + option code + frequency + model code
Example	DFV 14-KEC 155.520 MHz 100B15

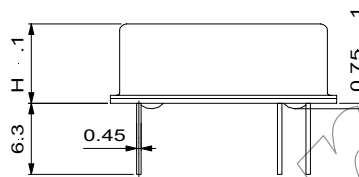
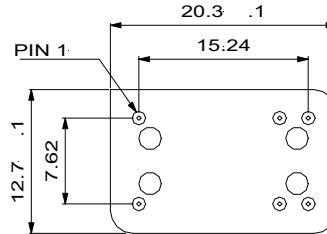
HIGH FREQUENCY DIL 14 VCXO DFV 14-MLECP (3.3 V)

RECOMMENDED FOR NEW DESIGNS

CRYSTAL PACKED INTO ITS OWN HOLDER

VERY LOW JITTER

HIGH FREQUENCY PECL VCXO



Function	DFV 14
V control	1
GND	2
Output 2	3
Output 1	4
Vcc	5
NC	6

TYPE	DFV 14-MLECP
Frequency Range	160 to 200 MHz

ELECTRICAL SPECIFICATIONS	
supply voltage	3.3 V ± 5 %
supply current (no load)	100 μA
output load	100 kΩ PECL (50 Ω to 1.3 V)
duty cycle @ 50% level	45%...55/45 %
rise/fall times (20 to 80%)	≤ 0.5 ns
high/low levels	≥ 2.22 V / ≤ 1.7 V
jitter RMS (12 kHz to 5 MHz)	≤ 0.5 ps
complementary output on pin 3	180° phase shifted
start up	≤ 10 ms @ 3.15 V

FREQUENCY STABILITY			detailed tolerances [ppm]						
type	temperature range	model code	stability versus:				pulling range positive function	control voltage	
			temp.	@ 25°C	Vcc	load			ageing
DFV S7-MLECP	0 to 70°C	100B15	≤ ± 15	≤ ± 10	≤ ± 3	≤ ± 0.5	≤ ± 2	≥ ± 100	1.65 V ± 1.35 V
		100B25	≤ ± 25						
remarks		input impedance ≥ 10 kΩ, modulation bandwidth ≥ 10 kHz @ -3dB ageing is 1 st year at 25°C							

ORDERING CODE	type + option code + frequency + model code
Example	DFV 14-MLECP 200 MHz 100B15

REMARK	Please consult factory for -40 to +85°C versions Preliminary data sheet is subject to change without notice
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