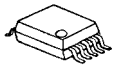
622MHz VCXO IC

■GENERAL DESCRIPTION

The NJM2555 is a 622.08MHz VCXO (Voltage Controlled Crystal Oscillator) IC designed for optical fiber telecommunication systems, using NewJRC superior Bipolar technology, which consists of an oscillation amplifier, a variable capacitor diode, a quadruple (x4) frequency circuit, high pass filter, and limiter amplifier. The NJM2555 generate x4 frequency to add the only 155.52MHz crystal and LC filter, and the output is differential LVPECL equivalent. The recommended input crystal frequency is from 120 to 160 MHz. The jitter performance and phase noise is very low based on excellent oscillation circuit. This can be applied to optical communication, especially the WDM system.

■PACKAGE OUTLINE

NJM2555C-C



NJM2555V

■FEATURES

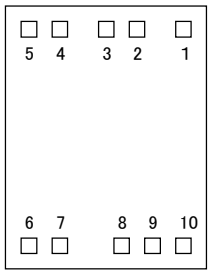
- ●Operating Voltage +3.0V to +3.6V
- ●Frequency range of Crystal 155.52 MHz typ. (120 to 160 MHz)
- ●Output Frequency Range 622.08 MHz typ. (480 to 640 MHz)
- ●Output Level differential LVPECL equivalent
- ●A Variable Capacitor on chip
- ●Bipolar Technology
- ●Package Die and SSOP-10

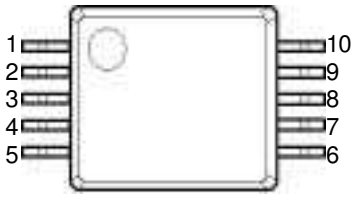
■TERMINAL DESCRIPTION

No.	Symbol	Function	X	Y
1	V_{OSC}	OSC Supply Voltage	550	835
2	XT1	Quartz Crystal Connecting terminal 1	140	835
3	XT2	Quartz Crystal Connecting terminal 2	-80	835
4	V_{VC}	Frequency Control	-435	835
5	GND	GND=0V	-635	835
6	F_{OUT1}	Frequency Output 1	-635	-835
7	F_{OUT2}	Frequency Output 2	-395	-835
8	T1	Tunable Filter Terminal 1	165	-835
9	T2	Tunable Filter Terminal 2	405	-835
10	V_{CC}	V_{CC}=3.3V	635	-835

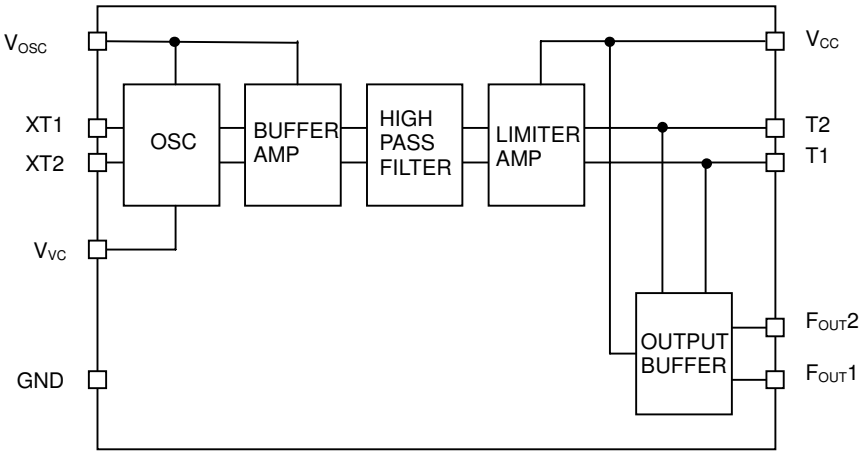
Starting Point :Die Center unit:[um]
Chip Size :1.60x2.00[mm]
Chip Thickness :260 ±20[um]
Pad Size :90x90[um]

■COORDINATES





■BLOCK DIAGRAM



■ABSOLUTE MAXIMUM RATINGS (Ta=25℃)

Parameter	Symbols	Ratings	Unit
Supply Voltage	V_{CC}	-0.3 to 5.0	V
Power Dissipation	P_D	250 (SSOP-10)	mW
Operating Temperature Range	Topr	-40 to +85	℃
Storage Temperature Range	Tstg	-55 to +125	℃

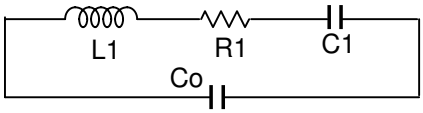
■ELECTRICAL CHARACTERISTICS (Ta=25℃)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Supply Voltage	V_{CC}	-	3.0	3.3	3.6	V
Operating Current	I_{CC}	F_{OUT}=622MHz	40	50	60	mA
Power Consumption	P_D	F_{OUT}=622MHz	120	165	216	mW
Maximum VC Range	V_{CONTH}	-	V_{CC}-0.3	V_{CC}	V_{CC}+0.3	V
Minimum VC Range	V_{CONTL}	-	-0.3	0	0.3	V

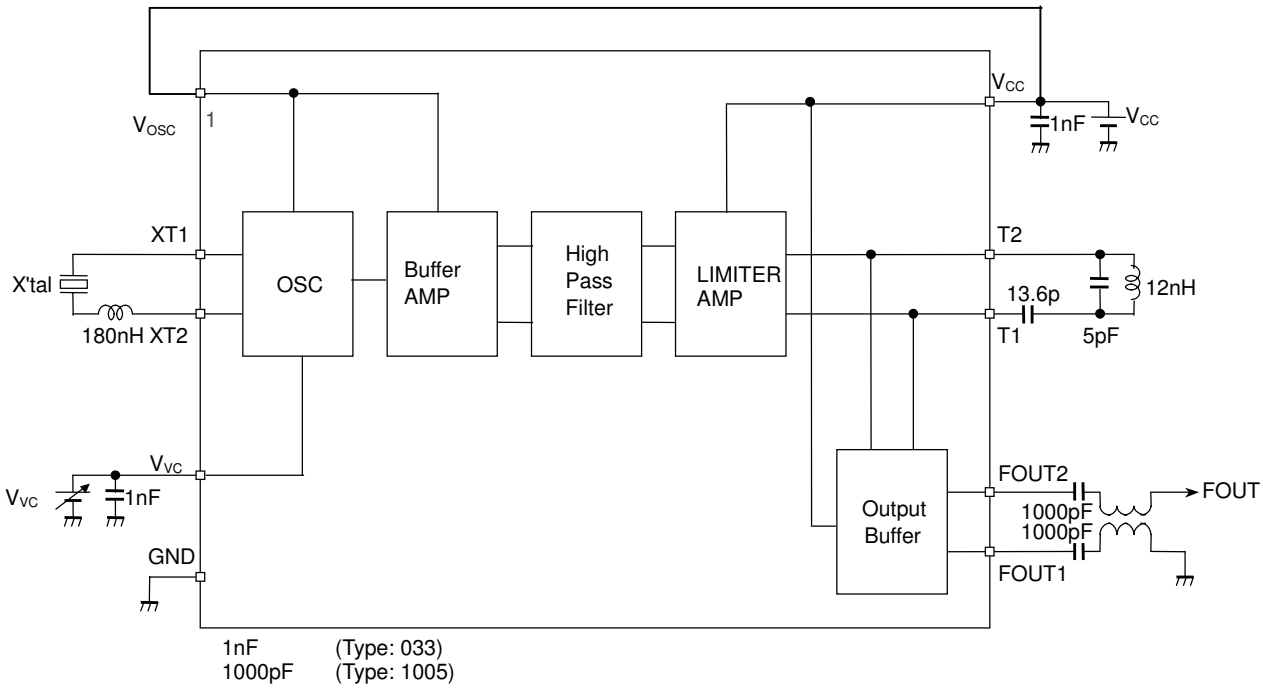
■REFERENTIAL DATA (V_{CC}=V_{OSC}=3.3V, Ta=25℃)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Frequency	F_{OUT}	Min.: 120MHz crystal Typ.: 155.5MHz crystal Max.: 160MHz crystal	480	622	640	MHz
Frequency Pull Range	F_{CONT}	Note 1)	±90	±100	±120	ppm
Output Level	P_{OUT}	50 ohm load	-1.5	1.5	4.5	dBm
Lower & Higher Harmonics D/U Ratio	FDU	50 ohm load Note 2)	-20	-25	-	dBc
Symmetry	SYM	50 ohm load	45	50	55	%
Jitter	JITTER	50 ohm load	5	9	16	ps rms

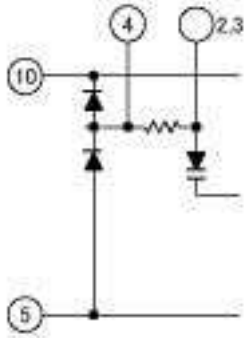
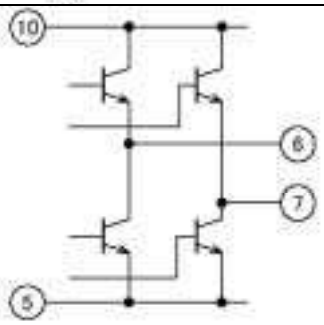
Note 1) Frequency Pull Range is determined by using 155.5MHz quartz crystal.
The parameters are as follows;
L1=0.135mH, R1=15.22Ω, C1=7.72fF, Co=2.3pF
Note 2) Tunable Filters are connected at T1 & T2 terminals.



■TEST CIRCUIT & BLOCK DIAGRAM



■TERMINAL INFORMATION

No.	Symbol	Equivalent Circuit	Comment
2, 3, and 4	XT1, XT2, and V_{VC}		
6, 7,	F_{OUT1}, F_{OUT2},		
8, 9,	T1, T2,