

OPERATION TEST REPORT ON TDK CERAMIC RESONATOR

(CCR16.0MXC7)

IC R5F212L4SNFP-HIGH  
(Renesas Technology)

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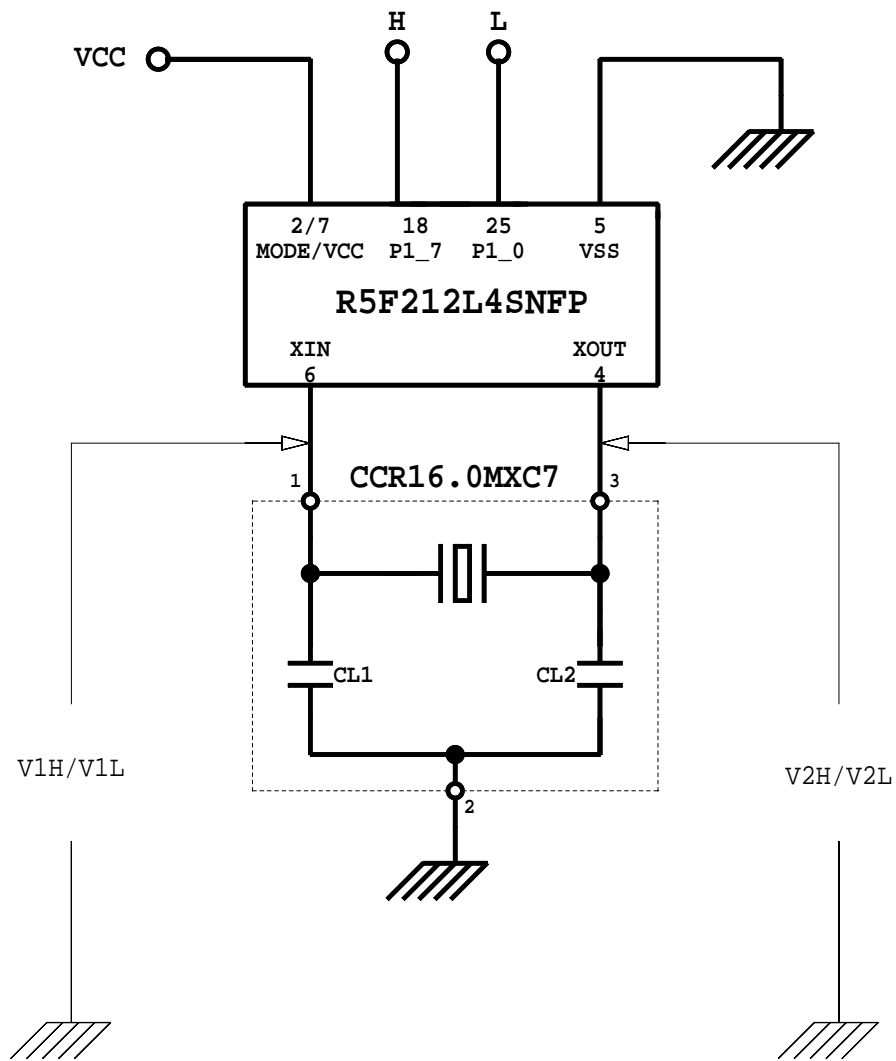
## 2.Test Conditions

IC	:	R5F212L4SNFP-HIGH (Renesas Technology)
Ceramic Resonator	:	CCR16.0MXC7 (Typical and worst sample are tested)
Power Supply Voltage range	:	3.0 to 5.5(V)
Temperature Range	:	-45 to +110(degC)

## 3.Conclusions and recommendable circuit constant

We could confirm the operation satisfactory under  
the following test conditions.

Power Supply Voltage range	:	3.0 to 5.5(V)
Temperature Range	:	-45 to +110(degC)
Load capacitance(CL1/CL2)	:	Built-in [9(pF)]
Damping resistance(Rd)	:	short (0ohm)
Feedback resistance(Rf)	:	Built-in(IC side)



\*BUILT-IN LOADING CAPACITOR  
 CL1/CL2=9/9pF +/-20%

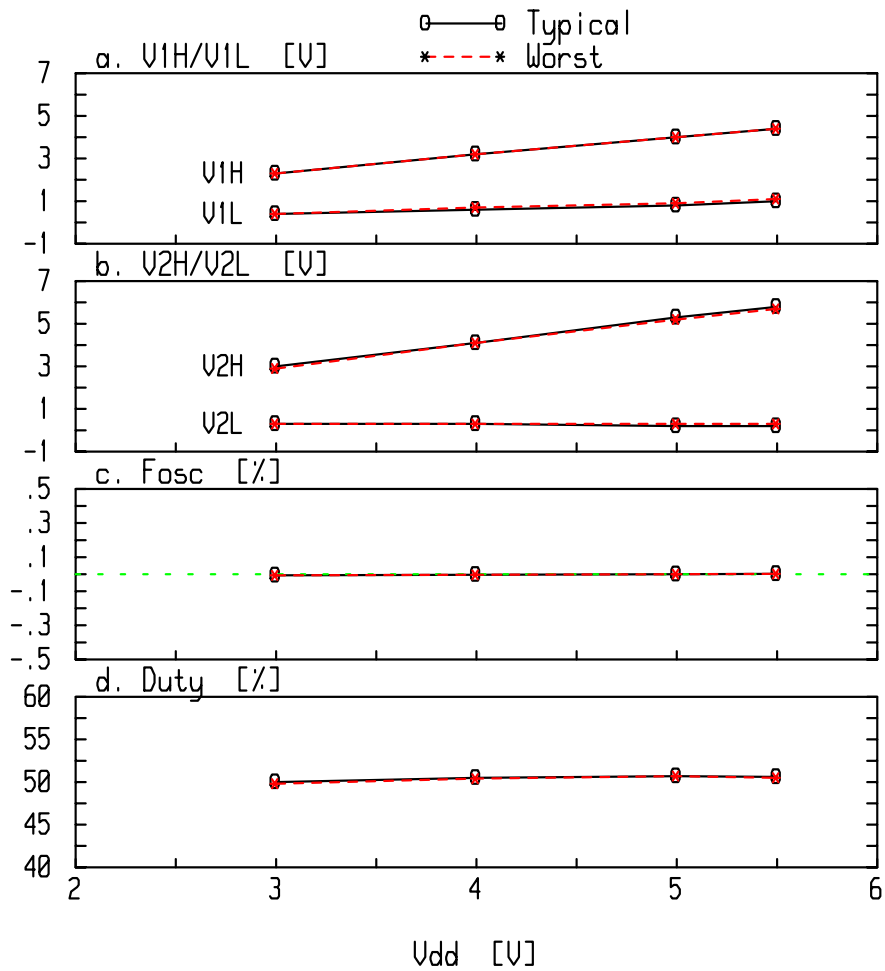
Oscillating circuit for evaluation

IC dependence of oscillating characteristics

R5F212L4SNFP  
CCR16.0MXC7 - S

Room Temp.  
Vdd [V] 5 (item a~e)

item IC NO	a. [V] V1H/V1L	b. [V] V2H/V2L	c. [MHz] Fosc	d. [uS] Trise	e. [%] Duty	f. [V] Vstart	g. [V] Uhold
LL	4 .8	5.2 .2	16.0073	104	50.7	1.72	1.55
LH	4 .8	5.3 .3	16.0073	106	51.1	1.86	1.81
TYP	4 .8	5.2 .2	16.0073	102	50.4	1.88	1.81
HL	4 .7	5.2 .2	16.0074	104	50.2	1.87	1.81
HH	4.1 .7	5.2 .2	16.0071	103	50.6	2.01	1.93



e. V<sub>start</sub> [V]  
 Typical = 1.88  
 Worst = 1.93

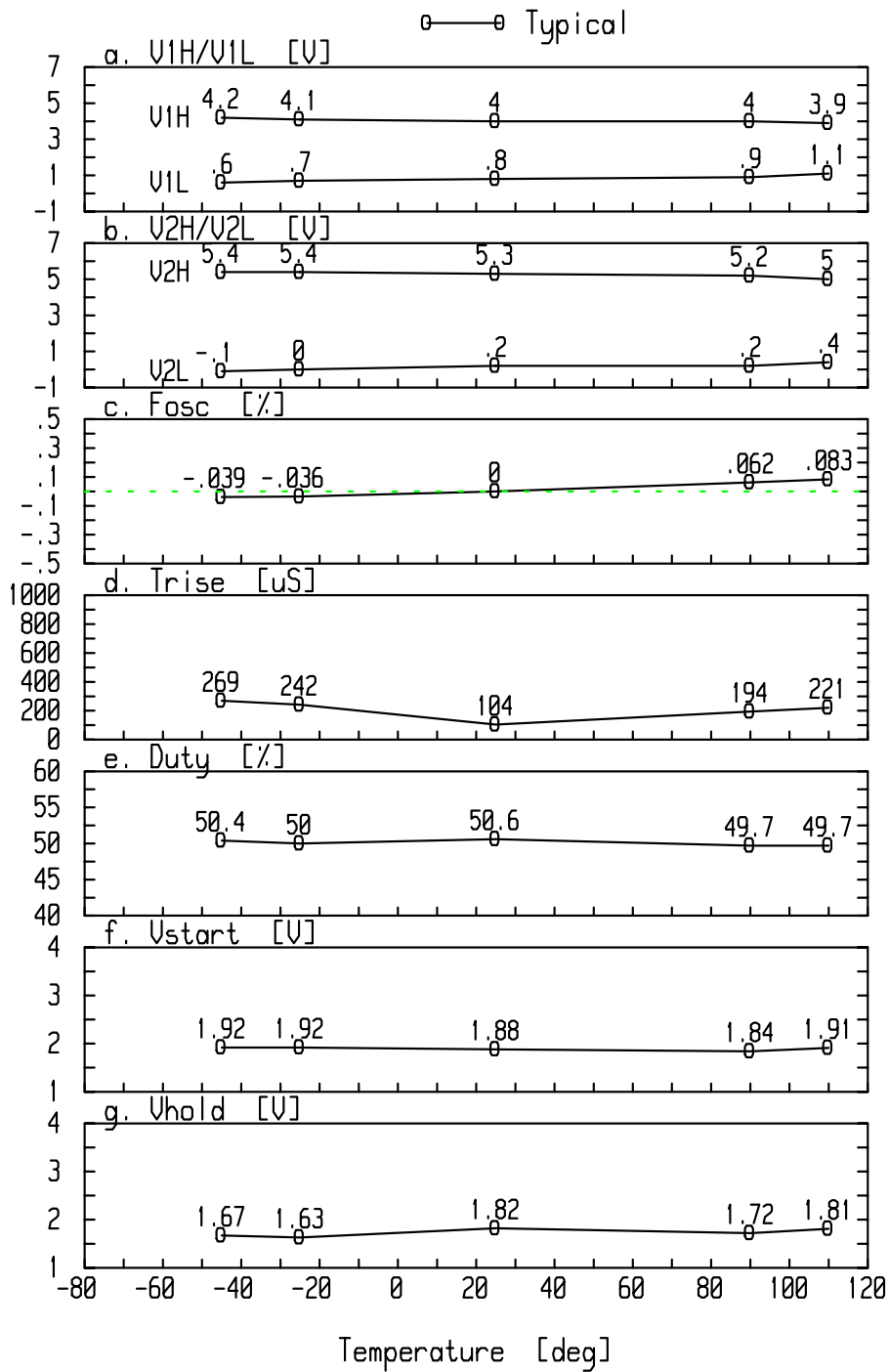
f. V<sub>hold</sub> [V]  
 Typical = 1.82  
 Worst = 1.89

Power supply voltage dependence of oscillating characteristics

R5F212L4SNFP - TYP(HIGH)

CCR16.0MXC7

V<sub>dd</sub>= 5 [V] (Fig.a~e)

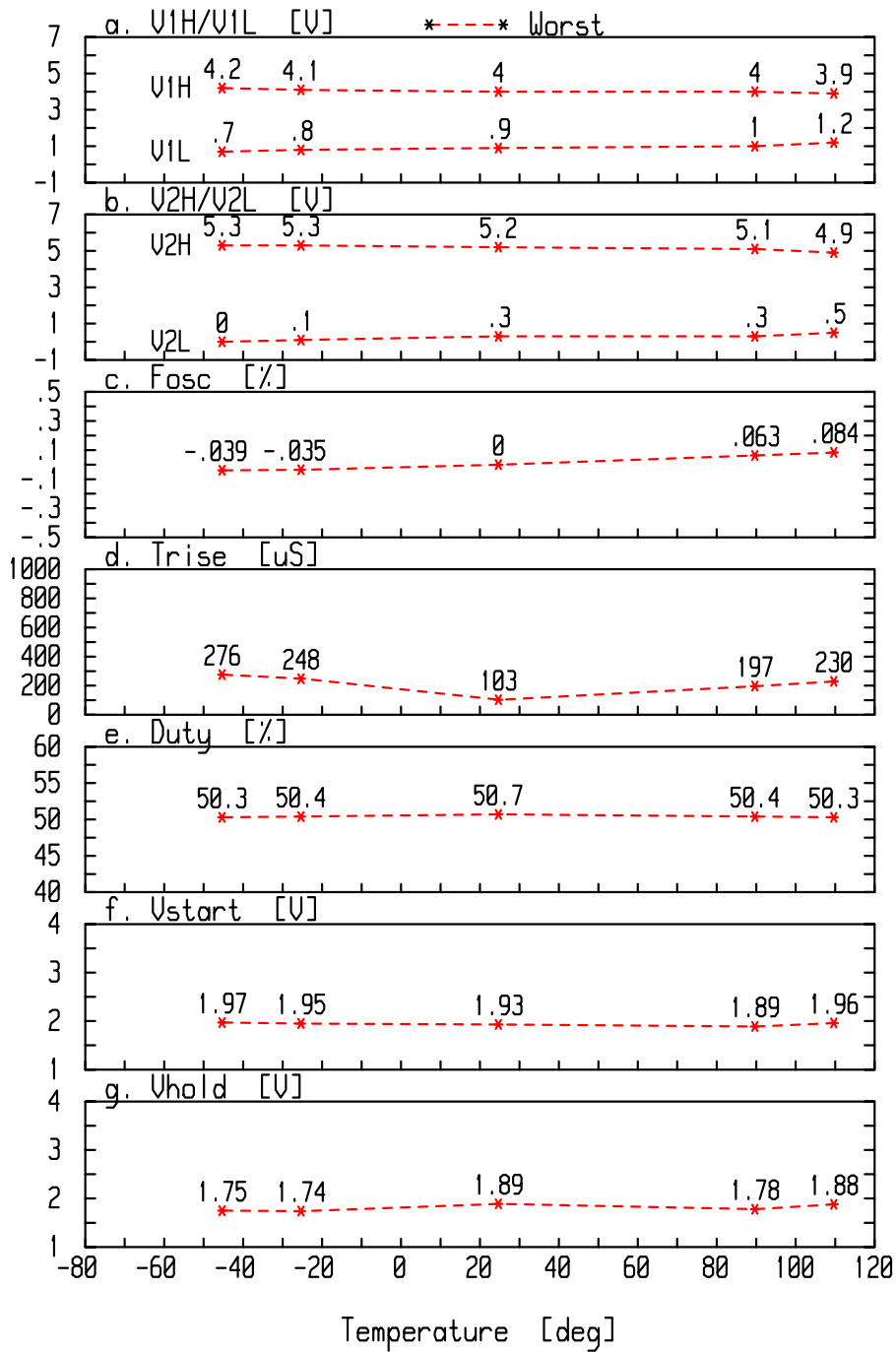


Temperature dependence of oscillating characteristics

R5F212L4SNFP - TYP(HIGH)

CCR16.0MXC7

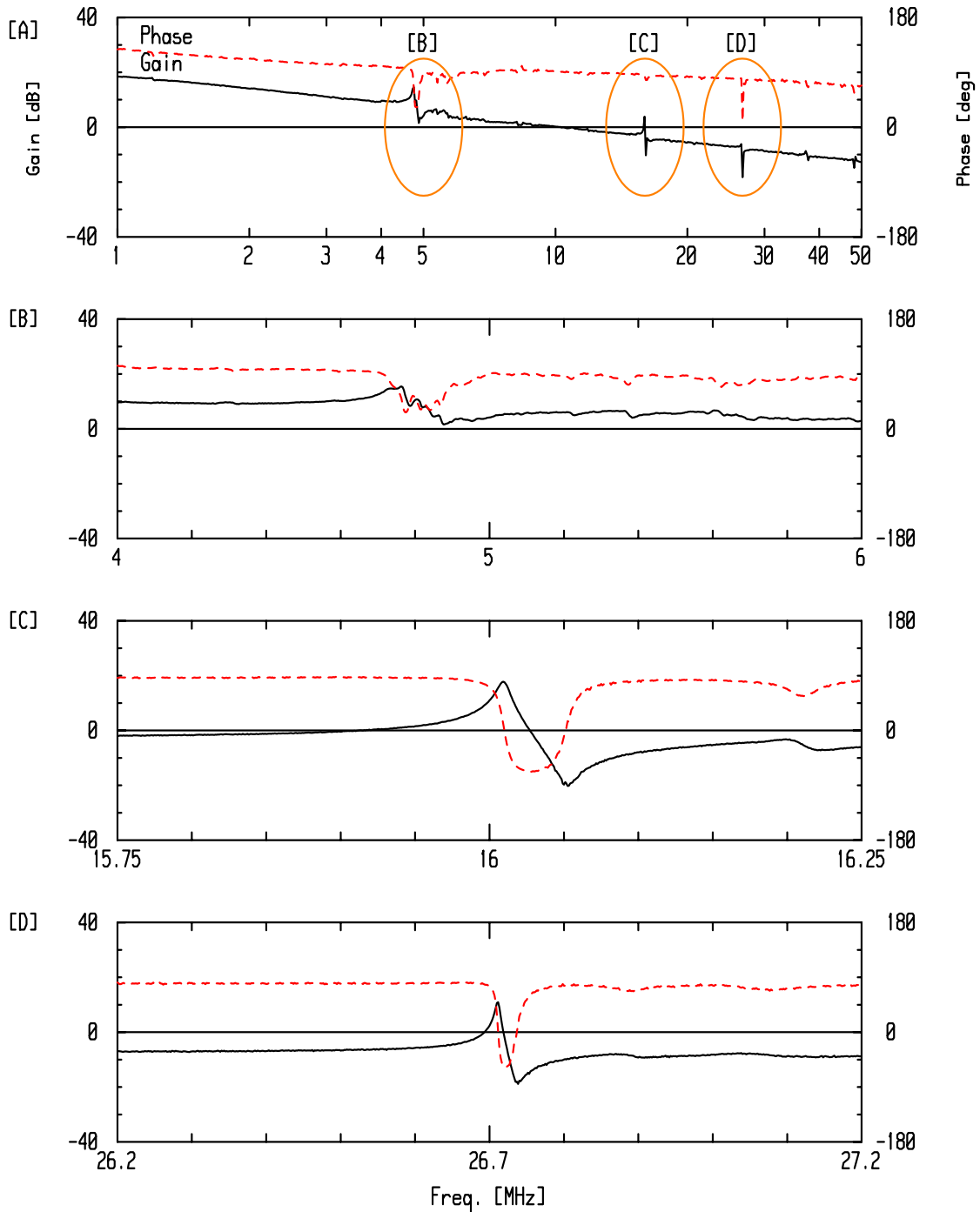
V<sub>dd</sub>= 5 [V] (Fig. a~e)



Temperature dependence of oscillating characteristics

R5F212L4SNFP - TYP(HIGH)  
 CCR16.0MXC7 - Typical  
 Vdd [V] 5

	[B]	[C]	[D]
Gmax [dB]	15.4	17.8	10.9
LGM [dB]	0	17.8	9
Pmin [deg]	27	-67.7	-58.1
LPM [deg]	0	-67.1	-57

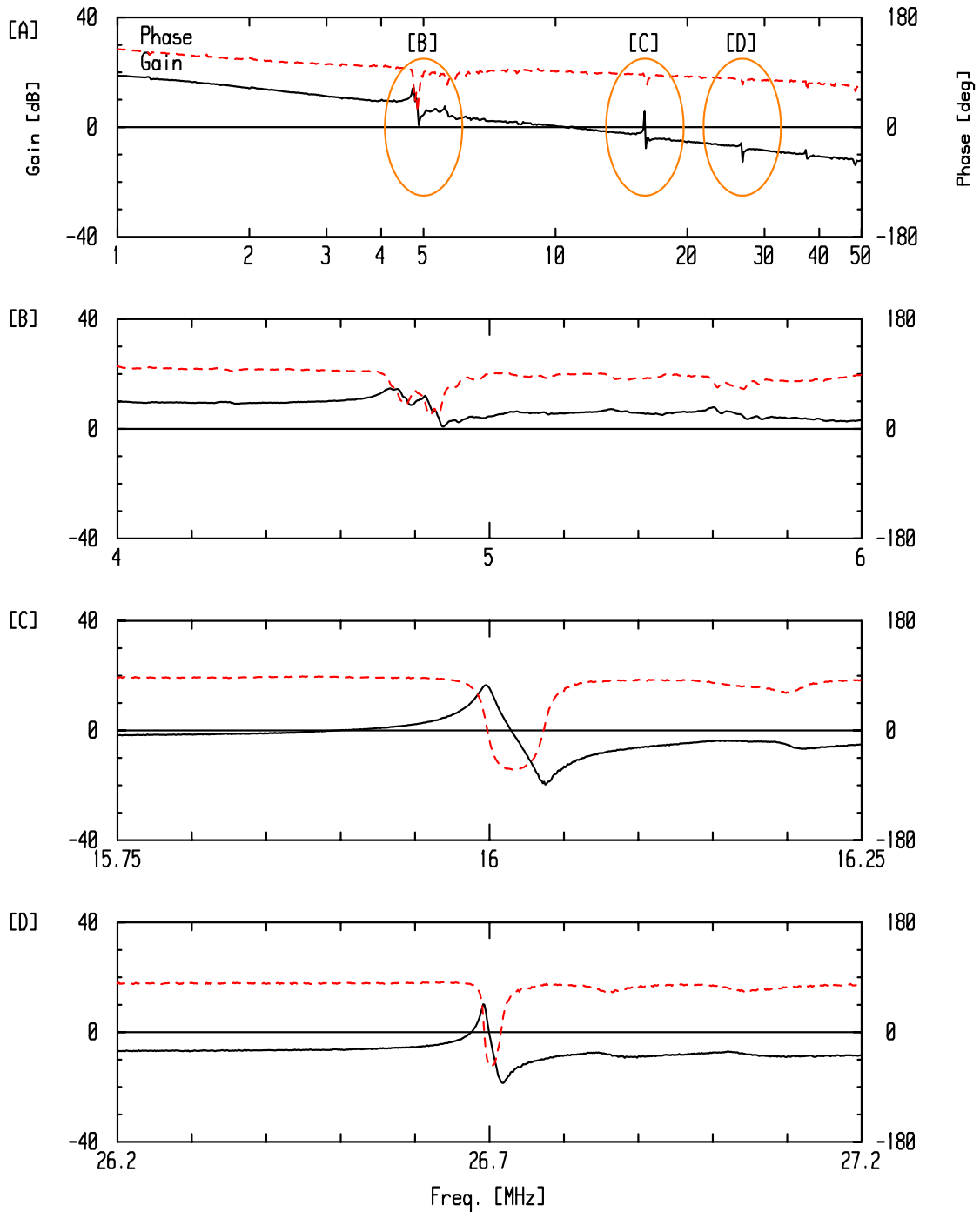


Open loop characteristics (Typical Sample)



R5F212L4SNFP - TYP(HIGH)  
 CCR16.0MXC7 - Worst  
 Vdd [V] 5

	[B]	[C]	[D]
Gmax [dB]	14.8	16.6	10.2
LGM [dB]	0	16.1	10.2
Pmin [deg]	22.8	-64.2	-56.7
LPM [deg]	0	-63.5	-52.3



Open loop characteristics (Worst Sample)