Technical Data of Ceramic Resonator

MURATA Part No.: CSTCE16M0V53-R0

Applied to R5F21256SNFP(High)

TOYAMA MURATA MANUFACTURING CO., LTD.

Product Engineering Service Section VI
Piezoelectric Components Department I
Piezoelectric Components Division
Device Business Unit

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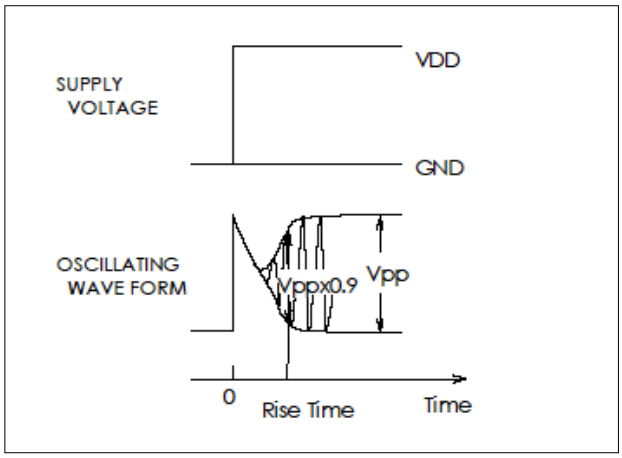
Contents

Note : Rise Time

"Rise time" is defined as the time when oscillation voltage reaches 90% of full voltage swing after Vdd(Vset) is supplied.

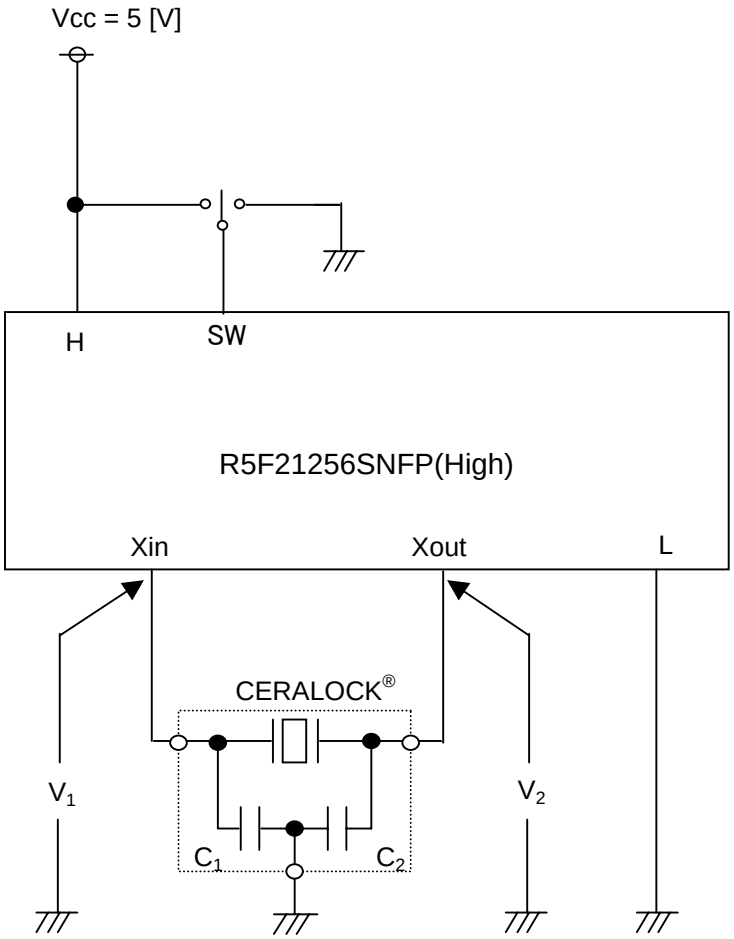


In the case that rising time of Vdd(Vset) is slow comparing to resonator's rise time due to the bypass capacitor, resonator's rise time is also slow because it depends on rising time of Vdd(Vset).

Also, in the case that the time supplying voltage to the oscillator circuit takes a certain time by reset time etc after Vdd(Vset) is applied, resonator's rise time is also slow.

In these case, we will describe "Unable to measure" in rise time data, because we can not measure resonator's rise time correctly.

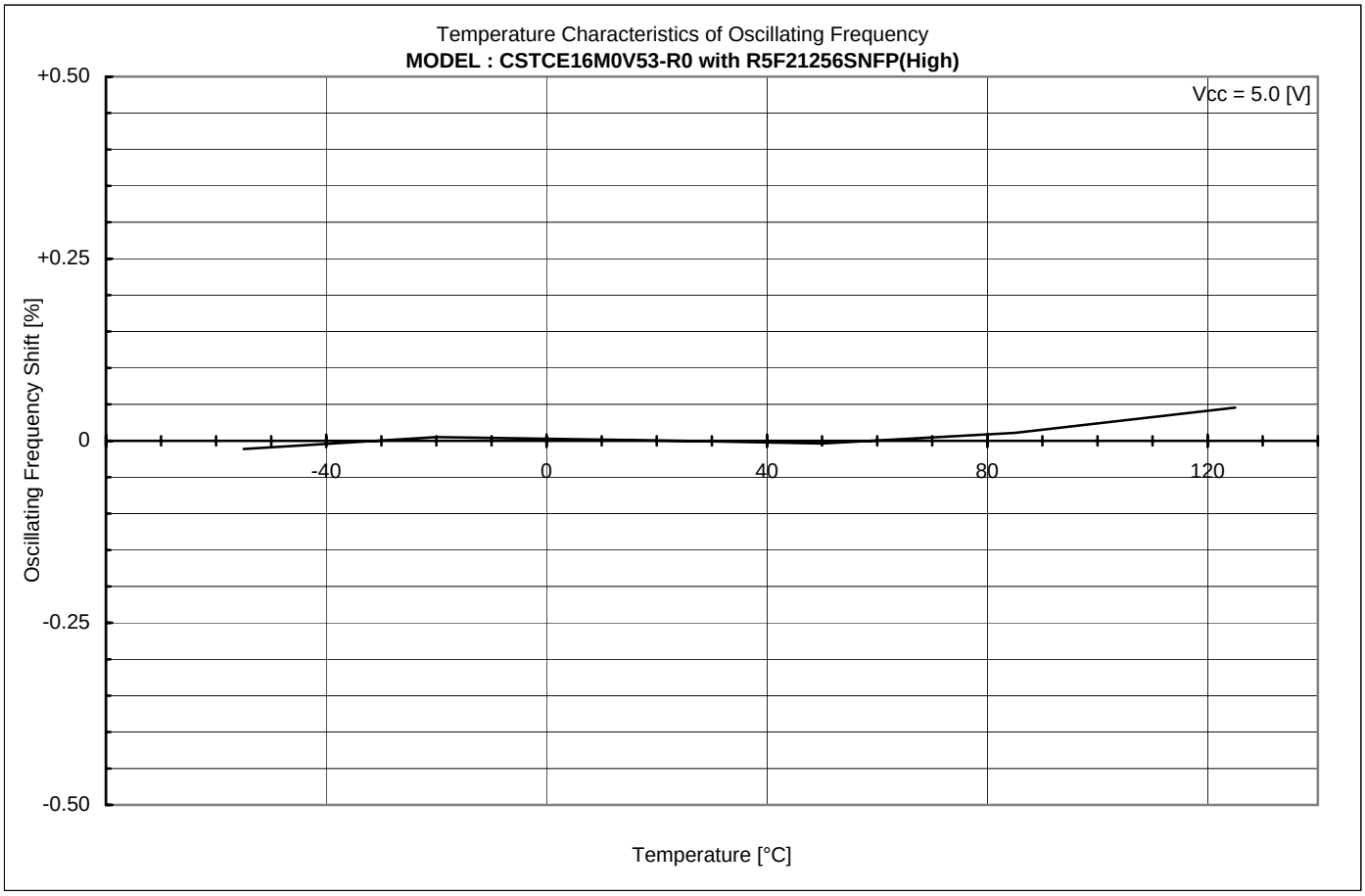
Test Circuit

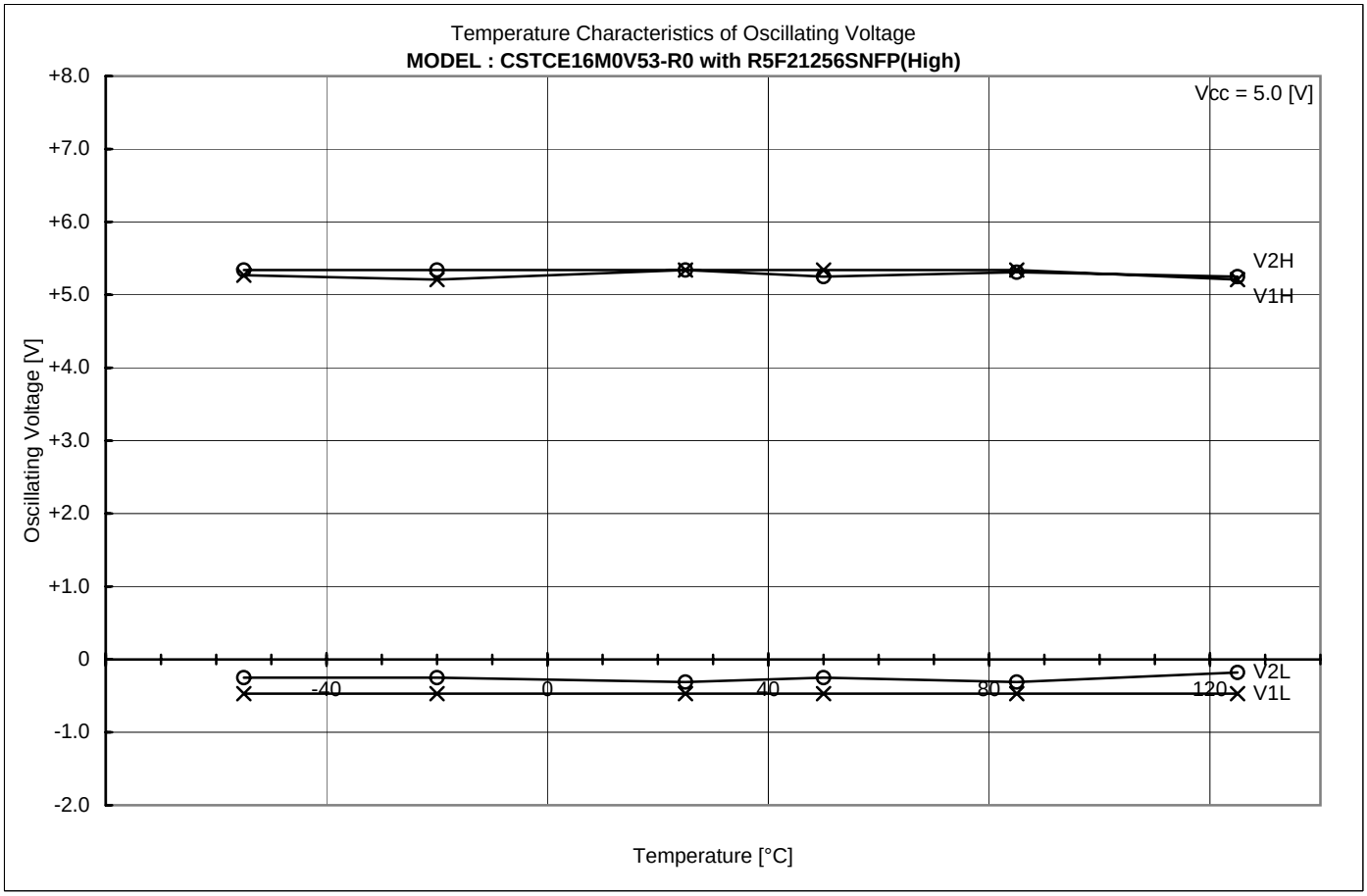


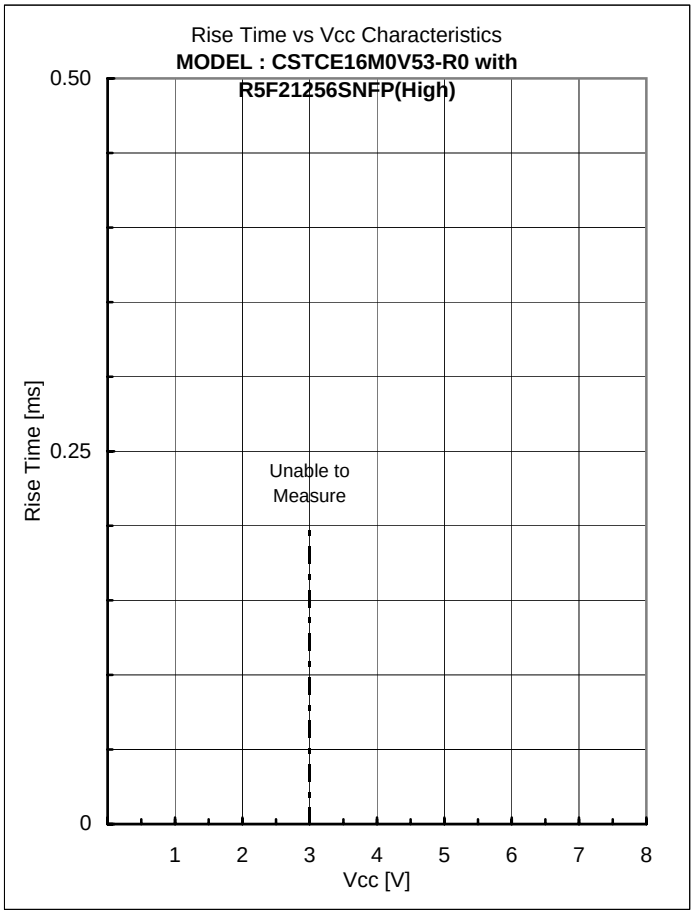
SEL	$\overline{\text{RESET}}$ 8pin	P1_7/TRAIO/$\overline{\text{INT1}}$ 21pin	P4_5/$\overline{\text{INTO}}$ 27pin
SW	L→H	H	H→L

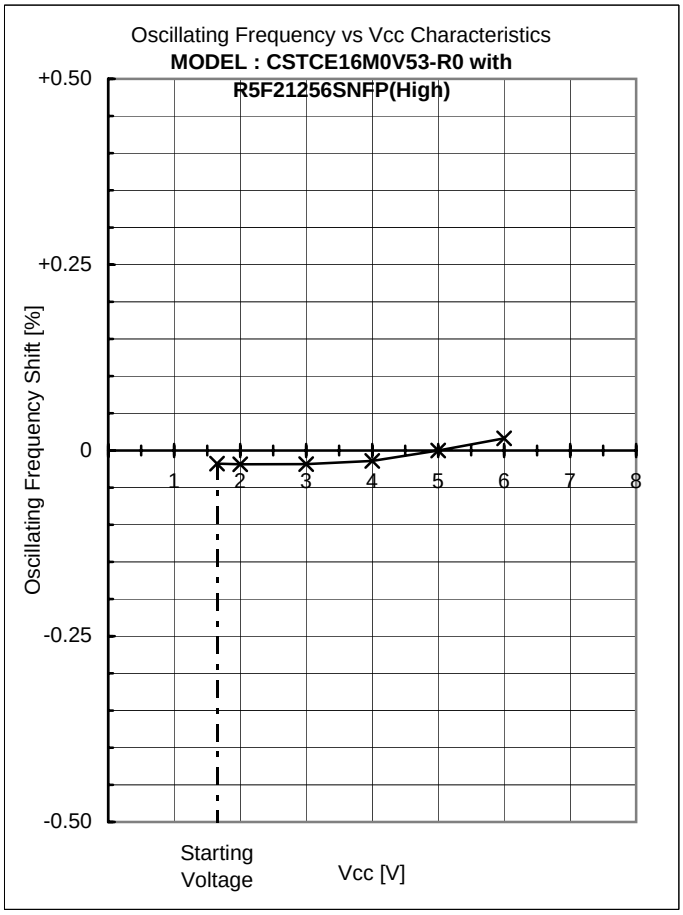
Xin : 11
Xout: 9
H : 5, 12
L : 10

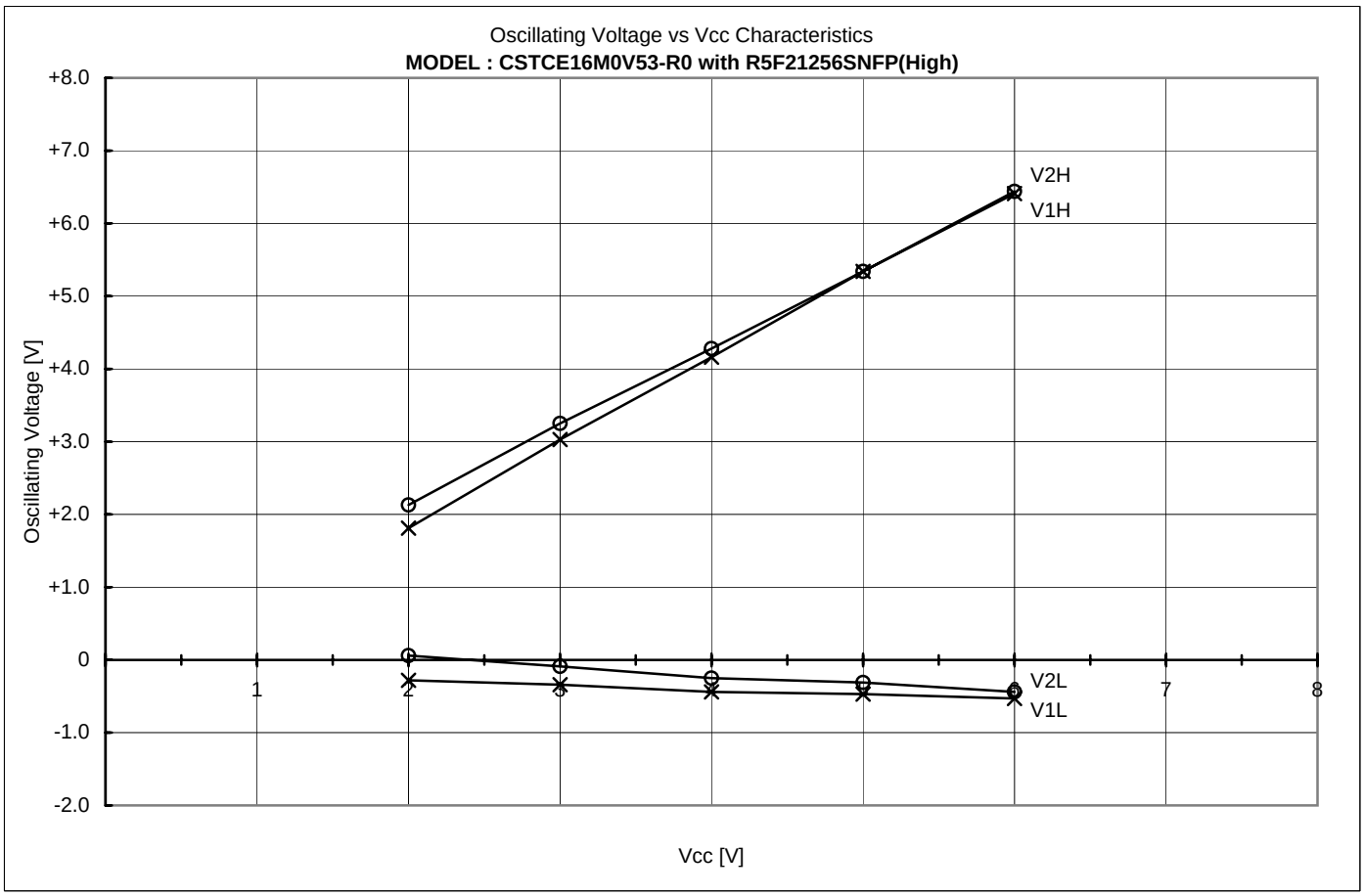
Recommended Value
CERALOCK® : CSTCE16M0V53-R0
Vcc = 3.0 to 5.5 [V]
C1 = 15 [pF] (Typ.)
C2 = 15 [pF] (Typ.)
Ta = -40 to 85 [°C]


Temperature Characteristics of Oscillating Frequency
MODEL : CSTCE16M0V53-R0 with R5F21256SNFP(High)
Vcc = 5.0 [V]
+0.50
+0.25
0
-0.25
-0.50
Oscillating Frequency Shift [%]
-40
0
40
80
120
Temperature [°C]


Temperature Characteristics of Oscillating Voltage
MODEL : CSTCE16M0V53-R0 with R5F21256SNFP(High)
Vcc = 5.0 [V]
+8.0
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
0
-1.0
-2.0
Oscillating Voltage [V]
V2H
V1H
V2L
V1L
-40
0
40
80
120
Temperature [°C]


Rise Time vs Vcc Characteristics
MODEL : CSTCE16M0V53-R0 with
R5F21256SNFP(High)
Rise Time [ms]
0.50
0.25
0
Unable to
Measure
1
2
3
4
5
6
7
8
Vcc [V]


Oscillating Frequency vs Vcc Characteristics
MODEL : CSTCE16M0V53-R0 with
R5F21256SNFP(High)
Oscillating Frequency Shift [%]
+0.50
+0.25
0
-0.25
-0.50
1
2
3
4
5
6
7
8
Starting
Voltage
Vcc [V]


Oscillating Voltage vs Vcc Characteristics
MODEL : CSTCE16M0V53-R0 with R5F21256SNFP(High)
Oscillating Voltage [V]
+8.0
+7.0
+6.0
+5.0
+4.0
+3.0
+2.0
+1.0
0
-1.0
-2.0
V2H
V1H
V2L
V1L
1
2
7
8
Vcc [V]

Appendixes

Comparison Table

IC : No	V1H [V]	V1L [V]	V1p-p [V]	V2H [V]	V2L [V]	V2p-p [V]	Fosc [kHz]	Trise [ms]	Vstart [V]
WS	5.34	-0.47	5.81	5.34	-0.31	5.65	16013.190	Unable to	1.65
LL	5.37	-0.47	5.84	5.34	-0.38	5.72	16013.847	Measure	1.52
LH	5.31	-0.47	5.78	5.41	-0.31	5.72	16012.720		1.63
HH	5.37	-0.47	5.84	5.34	-0.38	5.72	16011.844		1.65
HL	5.34	-0.47	5.81	5.34	-0.38	5.72	16013.692		1.65

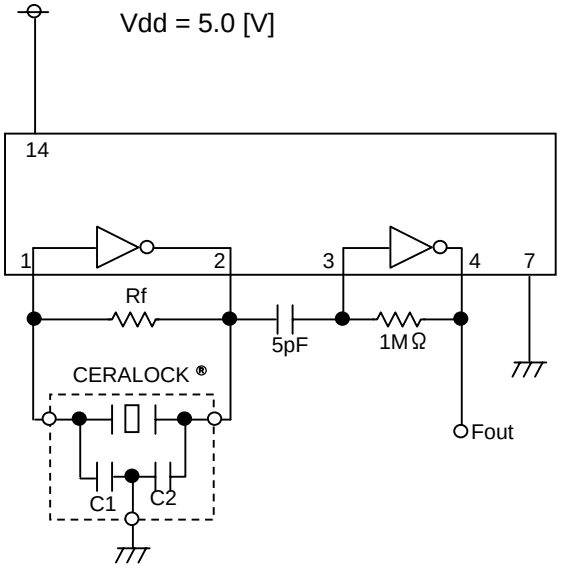
Ref.

Performance described page 2 to 3 were measured with IC No. WS

Frequency Correlation Data

Sample No.	R5F21256SNFP(High) Fosc [kHz]	TC74HCU04AP Fosc [kHz]	Shift [%]
1	16025.469	15981.100	0.2776
2	16043.889	15996.700	0.2950
3	16055.903	16011.800	0.2754
4	16029.578	15982.800	0.2927
5	16094.166	16035.400	0.3665
$\bar{X}$	16049.801	16001.560	0.3015

muRata Standard Circuit



CERALOCK® : CSTCE16M0V53-R0
C1 = 15 [pF]
C2 = 15 [pF]
Rf = 1 [Mohm]