

LOW ESR SMD MHz SMD QUARTZ CRYSTAL

SERIES „SMD0503/4“ (5.0x3.2mm / 4pads)

FEATURES

- + High reliability for low cost
- + Standard operating temperature range of 0/+50°C to -40/+125°C
- + Excellent clock generator for CPU´s, Wireless, Mobile Comm., IoT, IIoT, WIFI, Industrial, Telecom, Automotive, etc
- + LRT-TECHNOLOGY Inside ([LRT is Low ESR Resonator-Technology](#))^[1]
- + Our top quality promise / depth of production:
 - Only use of crystal blanks from our in-house production, based on our unique LRT-Technology
 - Excellent product features guaranteed by multiple 100% tests and 100% end-test
 - 100% quality monitoring from crystal raw material to the end product
 - Excellent quality, performance an reliability is guaranteed.



GENERAL DATA

PB FREE / ROHS COMPLIANT

PARAMETERS	PRODUCT FEATURES AND CONDITIONS
SMD-CRYSTAL SERIES	SMD0503/4
NUMBER OF SOLDER PADS	4
FREQUENCY RANGE	8.0 ~ 54.0 MHz Fundamental 54.0 ~ 133.0 MHz 3 rd Overtone
FREQUENCY TOLERANCES AT 25°C	±8 ppm ~ ±50 ppm
LOAD CAPACITANCE [C _L]	Series or 6 pF ~ 50 pF
WORKING TEMPERATURE RANGES	0/+50°C ~ -40/+125°C
TEMPERATURE STABILITY	±8 ppm ~ ±50 ppm (see FREQUENCY STABILITY VS. TEMPERATURE table)
SHUNT CAPACITANCE [C ₀]	3 pF max.
DRIVE LEVEL Fundamental	100 µW typ. / 200 µW max. (300 µW available on request)
DRIVE LEVEL 3 rd Overtone	100 µW typ. / 200 µW max. (300 µW available on request)
AGING	±2 ppm per year standard (±1 ppm per year on request)
INSULATION RESISTANCE	>500 MΩ DC/100V ±10%
STORAGE TEMPERATURE	-55°/+125°C
PRODUCT WEIGHT	0.054 g
MSL LEVEL	1
DELIVERY FORM	Tape and Reel (1.000 pcs per reel)
RoHS	Lead free and RoHS compliant
POP (EU)2019/1021	No POP substances
PFAS	No PFAS present
PROP 65	Compliant to PROP 65
TSCA	Compliant to TSCA
SELECT YOUR REQUIRED CRYSTAL (PRODUCT CONFIGURATOR)	REQUEST CRYSTAL SAMPLES (SAMPLE CONFIGURATOR)

Note:

1. LRT is optimized low ESR resonator design for fast and secure oscillation start-up
2. The reference temperature for all specified values and tests is +25°C.
3. Do not use cleaning baths operating at ultrasonic frequencies or ultrasonic welding processes.
4. Do not solder by hot air gun.

FREQUENCY STABILITY VS. TEMPERATURE

	±8ppm	±10ppm	±15ppm	±20ppm	±30ppm	±50ppm
0°/+50°C	+	+	+	+	+	+
-10°/+60°C	+	+	+	+	+	+
0°/+70°C	+	+	+	+	+	+
-20°/+70°C		+	+	+	+	+
-40°/+85°C			+	+	+	+
-40°/+105°C					+	+
-40°/+125°C						+

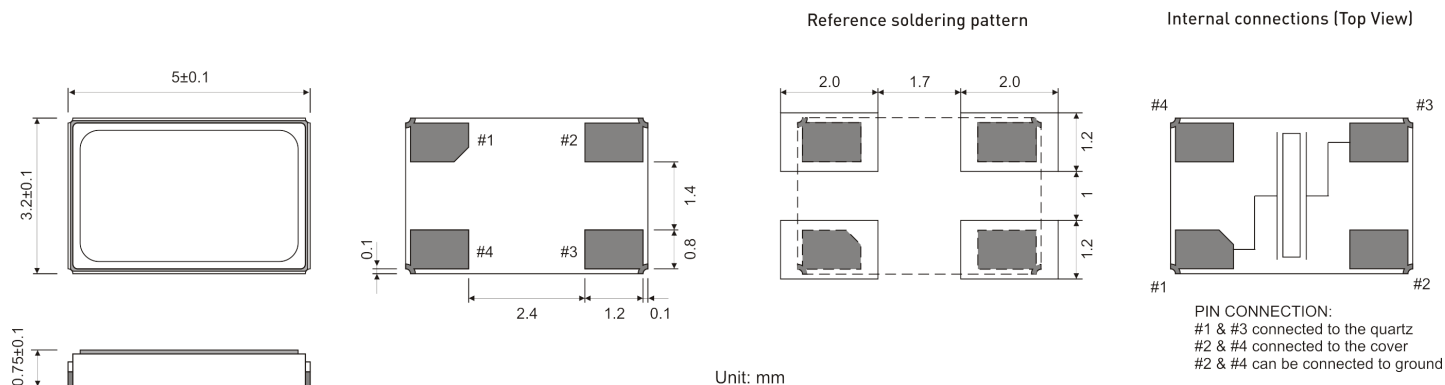
ESR (EQUIVALENT SERIES RESISTANCE)

FREQUENCY IN MHz	VIBRATION MODE	ESR MAX. IN Ω
8.0 ~ 16.0 MHz	Fundamental	80
16.0 ~ 54.0 MHz	Fundamental	25
54.0~ 133.0 MHz	3 rd Overtone	80

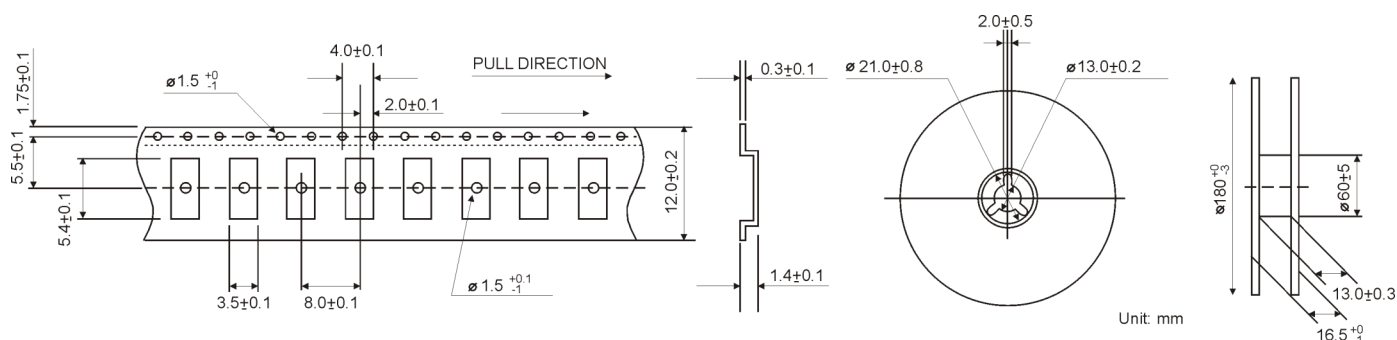
LIST OF STANDARD FREQUENCIES

8.0000 MHz	8.1920 MHz	8.7040 MHz	9.2160 MHz	9.7500 MHz	9.8136 MHz	9.81713 MHz
9.8304 MHz	9.84375 MHz	9.9000 MHz	9.984625 MHz	10.0000 MHz	10.3680 MHz	10.7750 MHz
10.78125 MHz	11.0592 MHz	11.2896 MHz	12.0000 MHz	12.2880 MHz	12.5000 MHz	12.8000 MHz
13.0000 MHz	13.225625 MHz	13.4000 MHz	13.40568 MHz	13.5000 MHz	13.5010 MHz	13.5020 MHz
13.5030 MHz	13.5040 MHz	13.5050 MHz	13.5060 MHz	13.5200 MHz	13.52172 MHz	13.5240 MHz
13.5260 MHz	13.5280 MHz	13.5296 MHz	13.5300 MHz	13.542969 MHz	13.5440 MHz	13.5596 MHz
13.5600 MHz	13.5672 MHz	13.568125 MHz	13.57187 MHz	13.5750 MHz	13.8240 MHz	14.0000 MHz
14.31818 MHz	14.4000 MHz	14.7456 MHz	15.0000 MHz	15.3600 MHz	16.0000 MHz	16.3680 MHz
16.3840 MHz	16.9344 MHz	17.6133 MHz	17.734475 MHz	18.4320 MHz	18.9375 MHz	19.0000 MHz
19.069928 MHz	19.2000 MHz	19.4400 MHz	19.6608 MHz	19.941944 MHz	20.000 MHz	20.0800 MHz
20.1646 MHz	20.4800 MHz	21.1450 MHz	21.948717 MHz	22.1184 MHz	22.5790 MHz	22.5792 MHz
24.0000 MHz	24.5760 MHz	24.8832 MHz	25.0000 MHz	25.78125 MHz	26.0000 MHz	26.7400 MHz
26.7600 MHz	27.0000 MHz	27.1200 MHz	28.0000 MHz	28.2240 MHz	28.3220 MHz	28.3750 MHz
28.63636 MHz	29.4912 MHz	30.0000 MHz	30.7200 MHz	32.0000 MHz	32.7680 MHz	33.0000 MHz
33.3000 MHz	33.3330 MHz	35.3280 MHz	36.0000 MHz	37.0500 MHz	37.4000 MHz	37.5000 MHz
38.3830 MHz	38.8800 MHz	39.0620 MHz	39.0640 MHz	40.0000 MHz	40.9600 MHz	41.0000 MHz
44.0000 MHz	48.0000 MHz	49.1520 MHz	50.0000 MHz	64.0000 MHz	99.9947 MHz	

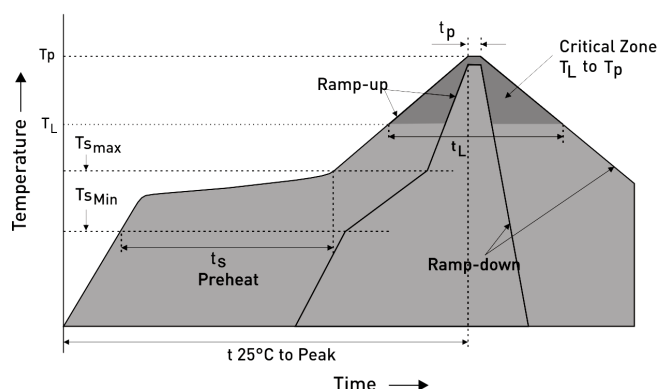
DIMENSIONS



REEL SPECIFICATION

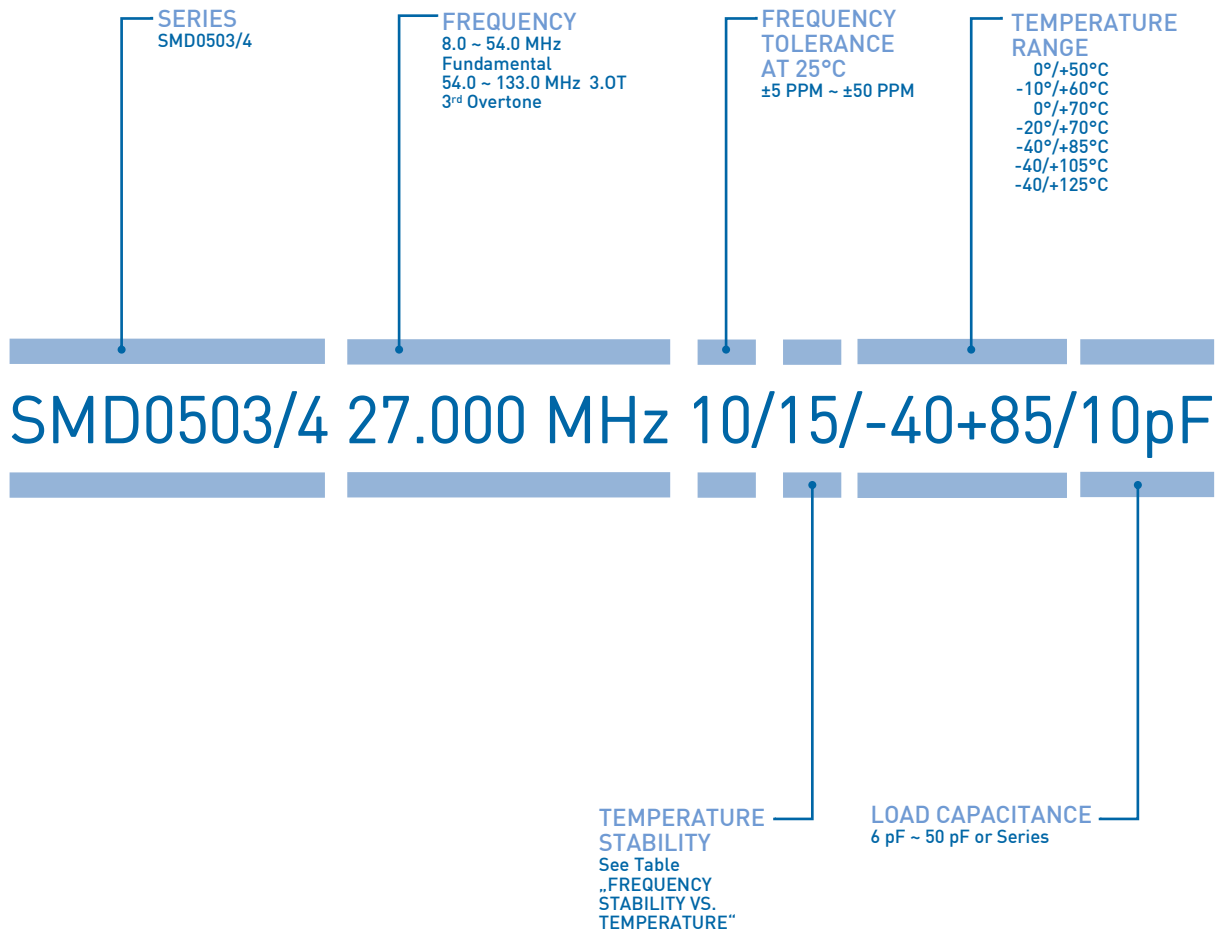


REFLOW SOLDER PROFILE



IPC/JEDEC Standard	IPC/JEDEC J-STD-020
Moisture Sensitivity Level	Level 1
TS MAX to TL (Ramp-up Rate)	3°C/second Maximum
Preheat	
- Temperature Minimum (TS MIN)	150°C
- Temperature Typical (TS TYP)	175°C
- Temperature Maximum (TS MAX)	200°C
- Time (tS)	60 - 180 Seconds
Ramp-up Rate (TL to TP)	3°C/second Maximum
Time Maintained Above:	
- Temperature (TL)	217°C
- Time (TL)	60 - 150 Seconds
Peak Temperature (TP)	260°C Maximum
Target Peak Temperature (TP Target)	255°C
Time within 5°C of actual peak (tP)	20 - 40 seconds
Max. Number of Reflow Cycles	2
Ramp-down Rate	6°C/second Maximum
Time 25°C to Peak Temperature (t)	8 minutes Maximum

ORDERING INFORMATION



EXAMPLE: SMD0503/4 27.000 MHz 10/15/-40+85/10pF
PLEASE INDICATE YOUR REQUIRED PARAMETERS

REVISION HISTORY^[2]

VERSION	RELEASE DATE	AMENDMENTS SUMMARY
00	APRIL 2015	+ Initial Data Sheet (SPEC 01/REV.00)
01	AUGUST 2015	+ Revised Drive Level + Revised Frequency vs. Temperature Table
02	AUGUST 2023	+ Revised Frequency range + Revised ESR + Added Standard Frequencies
03	AUGUST 2026	+ Add New Standard Frequencies



PREMIUM QUALITY BY PETERMANN-TECHNIK



OUR COMPANY IS CERTIFIED ACCORDING TO ISO 9001:2015 AND 14001:2015

THIS IS FOR YOU TO ENSURE THAT THE PRINCIPLES OF QUALITY MANAGEMENT ARE FULLY IMPLEMENTED IN OUR QM-SYSTEM AND QUALITY CONTROL METHODS .

THE HEARTBEAT OF YOUR INNOVATION!
RELIABLE · COST-EFFECTIVE · COMPETENT
DESIGN SMARTER – EMPOWERING YOUR PRODUCTS

FOR ALMOST 30 YEARS, WE HAVE BEEN YOUR SPECIALIST FOR CRYSTALS AND OSCILLATORS –
FROM PROVEN STANDARDS TO CUSTOM-TAILORED SOLUTIONS.

YOU DEVELOP WITH THE HIGHEST STANDARDS – WE DELIVER THE COMPONENTS TO MATCH:
INNOVATIVE, RELIABLE, AND COST-EFFICIENT.

CHOOSE OUR PRODUCTS AND BENEFIT FROM TOP-TIER QUALITY, INNOVATION, STABLE AND
INDEPENDENT SUPPLY CHAINS AND PARTNERSHIP ON HIGHEST LEVEL.

SUSTAINABLE SUCCESS FOR YOU AND YOUR PRODUCTS!