CLASS II X7R MULTILAYER CERAMIC CAPACITORS

MCH SERIES

- CLASS I, TEMPERATURE COMPENSATED: C0G
- CLASS II, HIGH DIELECTRIC CONSTANT: X7R & Y5V. Z5U ALSO AVAILABLE

The latest comprehensive data to fully support these parts is readily available.

LAB/STARTER KIT: PLEASE REFER TO PRODUCTION SECTION

MCH SERIES SPECIFICATIONS

Parameter	X7R	Test Conditions
Temperature range	-55 +125°C	
Temp. coefficients	≤ ±15%	
Dielectric loss tangent	2.5% Max	1KHz, 1vRMS
tan δ	0.1% Max	1MHz ,1vRMS
Insulation resistance	> 10,000MΩ or 500MΩ •μF*	After rated voltage applied for 60±5 sec
Withstanding voltage	No breakdown or mechanical damage	2.5x r. v.
End termination adherence	No peeling or sign of peeling shall be allowed on the end terminations	510gF (5n), 30 sec On alumina substrate
Solderability	75% of the surface of both end terminations should be covered evenly with new solder, without any breaks on the surface	Solder temp: 235±5°C Immersion time: 2±0.5 sec
Resistance to solder heat		Solder temp 260±5°C
Appearance:	No mechanical damage	Immersion time 5±0.5s
Cap'n change rate:	≤ ±5.0%	Preheat: 150±10°C,
tan δ:	Satisfies initial specified value	1-2 min
Insulation res'n:	> 10,000MΩ or 500MΩ • μF*	Measure after 24±2 hrs
Withstand voltage:		No damage
Humidity resistance		Temp. 40±2°C
Appearance:	No mechanical damage	RH: 90-95%
Cap'n change rate:	≤ ±10.0%	Test time: 500 hrs
tan δ:	≤ 5.0%	Measured after 24 hrs
Insulation res'n:	> 1,000MΩ or 50MΩ • μF*	
Life test		Max, operating temp
Appearance:	No mechanical damage	2x Rated voltage
Cap'n change rate	< ±10.0%	Test time: 1000 hours
Insulation res'n:	> 1,000MΩ or 50MΩ • μF*	Measured after 24 hrs

*: whichever is smaller. †: whichever is larger.

TAPE & REEL SPECIFICATIONS

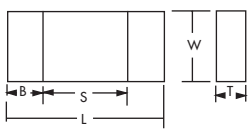
MCH15		
Tape Code	K	L
Tape Width	8mm	8mm
Reel Diameter	180mm	330mm
Quantity	10,000	50,000

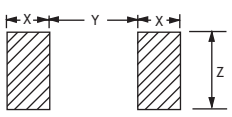
MCH18, MCH21, MCH31		
Tape Code	K	L
Tape Width	8mm	8mm
Reel Diameter	180mm	330mm
Qty. Th ≤ 1.0mm	4,000	16,000
Th = 1.25mm	3,000	12,000
For plastic tape, change:	K to P	L to Q

DIMENSIONS & TYPICAL FOOTPRINT

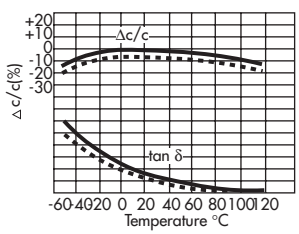
Size	Series	L	W	T max	B min	S min	X	Y	Z
0402	MCH15	1,0±0.05	0.5±0.05		0.1	0.3	0.4	0.5	0.6
0603	MCH18	1,6±0.2	0.8±0.2	SEE	0.15	0.4	0.7	0.8	0.8
0805	MCH21	2.0±0.2	1.25±0.2	PRICE	0.2	0.6	1.0	1.0	1.3
1206	MCH31	3.2±0.2	1.6±0.2	TABLE	0.2	1.0	1.0	2.0	1.6
1210	MCH32	3.2±0.2	2.5±0.2		0.3	1.0	1.2	2.0	2.5

All dimensions in mm.

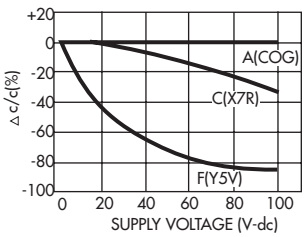




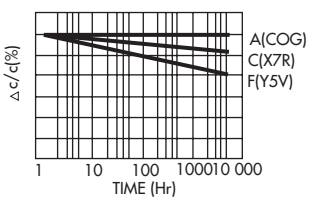
TEMPERATURE CHARACTERISTICS



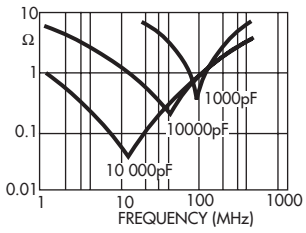
DC BIAS CHARACTERISTICS



AGEING CHARACTERISTICS



IMPEDANCE VERSUS FREQUENCY



CLASS II X7R MULTILAYER CERAMIC CAPACITORS

MCH SERIES X7R DIELECTRIC, 50V, 10%

0402

Part Number	Value	Th	SQP
100pF			
MCH155C221K	220pF	0.5	0.02
MCH155C271K	270pF	0.5	0.08
MCH155C331K	330pF	0.5	0.08
MCH155C391K	390pF	0.5	0.08
MCH155C471K	470pF	0.5	0.02
MCH155C561K	560pF	0.5	0.08
MCH155C681K	680pF	0.5	0.08
MCH155C821K	820pF	0.5	0.08
1nF			
MCH155C102K	1.0nF	0.5	0.02
MCH155C122K	1.2nF	0.5	0.08
MCH155C152K	1.5nF	0.5	0.08
MCH155C182K	1.8nF	0.5	0.08
MCH155C222K	2.2nF	0.5	0.08
MCH155C272K	2.7nF	0.5	0.08
MCH155C332K	3.3nF	0.5	0.04
MCH155C392K	3.9nF	0.5	0.08

For tape and reel, add 'K'.

0603

Part Number	Value	Th	SQP
100pF			
MCH185C221K	220pF	0.8	0.01
MCH185C271K	270pF	0.8	0.01
MCH185C331K	330pF	0.8	0.01
MCH185C391K	390pF	0.8	0.01
MCH185C471K	470pF	0.8	0.01
MCH185C561K	560pF	0.8	0.01
MCH185C681K	680pF	0.8	0.01
MCH185C821K	820pF	0.8	0.01
1nF			
MCH185C102K	1.0nF	0.8	0.01
MCH185C122K	1.2nF	0.8	0.02
MCH185C152K	1.5nF	0.8	0.01
MCH185C182K	1.8nF	0.8	0.01
MCH185C222K	2.2nF	0.8	0.01
MCH185C272K	2.7nF	0.8	0.01
MCH185C332K	3.3nF	0.8	0.01
MCH185C392K	3.9nF	0.8	0.01
MCH185C472K	4.7nF	0.8	0.01
MCH185C562K	5.6nF	0.8	0.01
MCH185C682K	6.8nF	0.8	0.01
MCH185C822K	8.2nF	0.8	0.01
10nF			
MCH185C103K	10nF	0.8	0.01

For tape and reel, add 'K'.

0805

Part Number	Value	Th	SQP
100pF			
MCH215C221K	220pF	0.6	0.01
MCH215C271K	270pF	0.6	0.01
MCH215C331K	330pF	0.6	0.01
MCH215C391K	390pF	0.6	0.01
MCH215C471K	470pF	0.6	0.01
MCH215C561K	560pF	0.6	0.01
MCH215C681K	680pF	0.6	0.01
MCH215C821K	820pF	0.6	0.01
1nF			
MCH215C102K	1.0nF	0.6	0.01
MCH215C122K	1.2nF	0.6	0.02
MCH215C152K	1.5nF	0.6	0.02
MCH215C182K	1.8nF	0.6	0.02
MCH215C222K	2.2nF	0.6	0.02
MCH215C272K	2.7nF	0.6	0.02
MCH215C332K	3.3nF	0.6	0.02
MCH215C392K	3.9nF	0.6	0.02
MCH215C472K	4.7nF	0.6	0.02
MCH215C562K	5.6nF	0.6	0.02
MCH215C682K	6.8nF	0.6	0.02
MCH215C822K	8.2nF	0.6	0.02
10nF			
MCH215C103K	10nF	0.6	0.02
MCH215C123K	12nF	0.6	0.02
MCH215C153K	15nF	0.6	0.02
MCH215C183K	18nF	0.6	0.02
MCH215C223K	22nF	0.6	0.02
MCH215C273K	27nF	0.85	0.03
MCH215C333K	33nF	0.85	0.03
MCH215C393K	39nF	0.85	0.03
MCH215C473K	47nF	1.25	0.03
MCH215C563K	56nF	1.25	0.03
MCH215C683K	68nF	1.25	0.04

For tape and reel, add 'K'. (Th 1.0mm)
'P' (Th 1.25mm).

1206

Part Number	Value	Th	SQP
100pF			
MCH315C221K	220pF	0.6	0.01
MCH315C271K	270pF	0.6	0.01
MCH315C331K	330pF	0.6	0.01
MCH315C391K	390pF	0.6	0.01
MCH315C471K	470pF	0.6	0.01
MCH315C561K	560pF	0.6	0.01
MCH315C681K	680pF	0.6	0.01
MCH315C821K	820pF	0.6	0.01
1nF			
MCH315C102K	1.0nF	0.6	0.01
MCH315C122K	1.2nF	0.6	0.01
MCH315C152K	1.5nF	0.6	0.01
MCH315C182K	1.8nF	0.6	0.01
MCH315C222K	2.2nF	0.6	0.01
MCH315C272K	2.7nF	0.6	0.01
MCH315C332K	3.3nF	0.6	0.01
MCH315C392K	3.9nF	0.6	0.01
MCH315C472K	4.7nF	0.6	0.01
MCH315C562K	5.6nF	0.6	0.01
MCH315C682K	6.8nF	0.6	0.01
MCH315C822K	8.2nF	0.6	0.01
10nF			
MCH315C103K	10nF	0.6	0.01
MCH315C123K	12nF	0.6	0.01
MCH315C153K	15nF	0.6	0.01
MCH315C183K	18nF	0.6	0.01
MCH315C223K	22nF	0.6	0.01
MCH315C273K	27nF	0.6	0.02
MCH315C333K	33nF	0.85	0.02
MCH315C393K	39nF	0.85	0.02
MCH315C473K	47nF	0.85	0.02
MCH315C563K	56nF	0.85	0.02
MCH315C683K	68nF	0.85	0.02
MCH315C823K	82nF	0.85	0.03
100nF			
MCH315C104K	100nF	0.85	0.02
MCH315C124K	120nF	1.25	0.04

For tape and reel, add 'K'. (Th 1.0mm)
'P' (Th 1.25mm).

MCH SERIES X7R DIELECTRIC, 25V, 10%

0402

Part Number	Value	Th	SQP
1nF			
MCH152C472K	4.7nF	0.5	0.02
MCH152C562K	5.6nF	0.5	0.02
MCH152C682K	6.8nF	0.5	0.03
MCH153C822K	*>8.2nF	0.5	0.10
10nF			
MCH153C103K	*>10nF	0.5	0.10

For tape and reel, add 'K'.
*: Only available at 16 volts

0603

Part Number	Value	Th	SQP
10nF			
MCH182C123K	12nF	0.8	0.04
MCH182C153K	15nF	0.8	0.04
MCH182C183K	18nF	0.8	0.04
MCH182C223K	22nF	0.8	0.02
MCH182C273K	27nF	0.8	0.06
MCH182C333K	33nF	0.8	0.04
MCH183C393K	*>39nF	0.8	0.06
MCH183C473K	*>47nF	0.8	0.04
MCH183C563K	*>56nF	0.8	0.06
MCH183C683K	*>68nF	0.8	0.06
MCH183C823K	*>82nF	0.8	0.06
100nF			
MCH183C104K	*>100nF	0.8	0.06

For tape and reel, add 'K'.
*: Only available at 16 volts

0805

Part Number	Value	Th	SQP
10nF			
MCH212C563K	56nF	0.85	0.03
MCH212C683K	68nF	0.85	0.03
MCH212C823K	82nF	1.25	0.04
100nF			
MCH212C104K	100nF	1.25	0.03
MCH212C124K	120nF	1.25	0.04
MCH212C154K	150nF	1.25	0.04
MCH213C184K	*180nF	1.25	0.04
MCH213C224K	*220nF	1.25	0.04

For tape and reel, add 'P'.
*: Only available at 16 volts

1206

Part Number	Value	Th	SQP
100nF			
MCH312C154K	150nF	1.15	0.04
MCH312C184K	180nF	1.15	0.04
MCH312C224K	220nF	1.15	0.04
MCH312C274K	270nF	1.15	0.04
MCH312C334K	330nF	1.15	0.05
MCH313C394K	*390nF	1.15	0.05
MCH313C474K	*470nF	1.15	0.07

For tape and reel, add 'P'.
*: Only available at 16 volts

MLC CAPACITOR PART NUMBER CROSS REFERENCE

	Chipsize						Dielectric					Voltage			Terminations			Packaging		
Manufacturer	0402	0603	0805	1206	1210	1812	NP0	X7R	Z5U	Y5V	Value Tol	16	25	50/63	100	200	Pd Ag	Ni. Bar.	Bulk	Tape & Reel
Rohm	MCH15	MCH18	MCH21	MCH31		-	A	C	E	F		3	2	5	-	-	-	MCH	No Code	P or K
TDK	CC0402	CC0603	CC0805	CC1206	CC1210	CC1812	NP0	X7R	Z5U	Y5V		C	E	H	-	-	-	CC	No Code	T & R
Goldstar	-	-	GMC21	GMC31	-	-	CG	X7R	-	Y5V		-	25	50	100	-	P	N	B	T
Murata	-	-	GR40	GR42-6	GR42-2	GR43-2	C0G	X7R	Z5U	Y5V	Refer to	-	25V	50V	100V	200V	GR	GRM	PB	PT
AVX/Kyocera	-	-	0805	1206	1210	1812	A	C	E	-	EIA	-	-	5	1	6	1	3	No Code	TR
Philips	-	-	0805	1206	1210	1812	CJ	2B	-	2F	Code	-	-	9	-	-	A	B	A	B
Syfer	-	-	0805	1206	1210	1812	C	X	Z	-		016	025	050	100	200	F	J	No Code	T
Vitramon	-	-	VJ0805	VJ1206	VJ1210	VJ1812	A	Y	U	-		-	-	A	B	-	F	X	No Code	T
Part Number Position Code			A				B			C	D	E			F			G		