

PSA PASSIVE SYSTEM ALLIANCE
WALSIN TECHNOLOGY CORPORATION

Product Guide

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Multilayer Ceramic Capacitors



Chip Resistors



Disc Capacitors



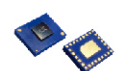
Inductors



RF Filters



Antenna



Antenna Switch & Module



MOV & MLV

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IEC-63 Nominal Resistance / Capacitance

E1	100																							
E3	100								220								470							
E6	100				150				220				330				470				680			
E12	100		120		150		180		220		270		330		390		470		560		680		820	
E24	100	110	120	130	150	160	180	200	220	240	270	300	330	360	390	430	470	510	560	620	680	750	820	910
E96	100	102	121	124	147	150	178	182	215	221	261	267	316	324	383	392	464	475	562	576	681	698	825	845
	105	107	127	130	154	158	187	191	226	232	274	280	332	340	402	412	487	499	590	604	715	732	866	887
	110	113	133	137	162	165	196	200	237	243	287	294	348	357	422	432	511	523	619	634	750	768	909	931
	115	118	140	143	169	174	205	210	249	255	301	309	365	374	442	453	536	549	649	665	787	806	953	976

E6: $\sqrt[6]{10} \approx 1.46$ E12: $\sqrt[12]{10} \approx 1.21$

E1 series resistance: 1Ω, 10Ω, 100Ω, 1000Ω, 10000Ω, 100000Ω

Multilayer Ceramic Capacitor

Quick Product Information

Series	Dielectric	Size	TCC	Capacitance	Tolerance*	Rated voltage
General Purpose Caps (4V~100V)	NPO	0201, 0402, 0603, 0805 1206, 1210, 1812, 1825 2220, 2225	-55 TO +125°C / ±30PPM/°C	0.1pF~0.1μF	A, B, C, D, F, G, J, K	10V, 16V, 25V, 50V, 100V
	X7R	0201, 0402, 0603, 0805 1206, 1210, 1812, 1825	-55 TO +125°C / ±15%	100pF~47μF	J, K, M	6.3V, 10V, 16V, 25V, 50V, 100V
	X6S	0201, 0402, 0603, 0805 1206, 1210	-55 to +105°C / ±22%	0.1μF~100μF	K, M	6.3V, 10V, 16V, 25V, 50V, 100V
	X7S	0402, 0603, 0805, 1206 1210	-55 to +125°C / ±22%	1.0μF~100μF	K, M	6.3V, 10V, 16V, 25V, 50V, 100V
	X5R	0201, 0402, 0603, 0805 1206, 1210	-55 TO +85°C / ±15%	100pF~220μF	K, M	4V, 6.3V, 10V, 16V, 25V, 50V
	Y5V	0402, 0603, 0805, 1206 1210, 1812	-25 TO +85°C / +30%/-80%	0.01μF~100μF	M, Z	6.3V, 10V, 16V, 25V, 50V, 100V
Ultra-small Caps (01R5 series)	NPO	01005	-55 TO +125°C / ±30PPM/°C	0.2pF~100pF	A, B, C, D, F, G, J	10V, 25V, 50V
	X7R	01005	-55 TO +125°C / ±15%	100pF~1000pF	K, M	10V
	X5R	01005	-55 TO +85°C / ±15%	1000pF~0.1μF	K, M	6.3V, 10V
Middle & High Voltage Caps (200V~4kV)	NPO	0402, 0603, 0805, 1206 1210, 1808, 1812, 1825 2220, 2225	-55 TO +125°C / ±30PPM/°C	0.5pF~0.1μF	C, D, J, K	200V, 250V, 500V, 630V, 1kV, 2kV, 3kV, 4kV
	X7R	0603, 0805, 1206, 1210 1808, 1812, 1825, 2220 2225	-55 TO +125°C / ±15%	100pF~2.2μF	K, M	200V, 250V, 400V, 450V, 500V, 630V, 1kV, 2kV, 3kV, 4kV
	Y5V	0805, 1206, 1210, 1812	-25 TO +85°C / +30%/-80%	0.01μF~0.68μF	Z	200V, 250V
High Voltage Caps (Surface Coating Type)	X7R	1206, 1210, 1808 1812, 1825, 2220, 2225	-55 TO +125°C / ±15%	150pF~0.018μF	K, M	2kV, 2.5kV, 3kV, 4kV
Microwave Caps (RF series)	NPO	01005, 0201, 0402 0603, 0805, 0505, 1111	-55 TO +125°C / ±30PPM/°C	0.1pF~1000pF	A, B, C, D, F, G, J	6.3V, 10V, 25V, 50V, 100V, 250V, 500V, 1500V
Microwave Caps Narrow Tolerance (UF series)	NPO	0402	-55 TO +125°C / ±30PPM/°C	0.05pF~3pF	P, Q, A, B	25V, 50V
Automotive Hi-Q Caps Qualified to AEC-Q200 (RT series)	NPO	0402	-55 TO +125°C / ±30PPM/°C	0.1pF~56pF	A, B, C, D, F, G, J	25V, 50V
High Q & Low ESR Caps (HH series)	NPO	0201, 0402, 0603, 0805	-55 TO +125°C / ±30PPM/°C	0.3pF to 3300pF	B, C, D, F, G, J	10V, 16V, 25V, 50V, 100V, 200V, 250V, 500V, 630V
Automotive Capacitor Qualified to AEC-Q200 (MT series)	NPO	0201, 0402, 0603, 0805 1206, 1210	-55 TO +125°C / ±30PPM/°C	0.1pF~0.047μF	B, C, D, F, G, J	10V, 16V, 25V, 50V, 100V, 250V, 500V, 630V, 1kV
	X7R	0201, 0402, 0603, 0805 1206, 1210	-55 TO +125°C / ±15%	100pF~2.2μF	J, K, M	10V, 16V, 25V, 50V, 100V, 250V, 500V, 630V, 1kV
Automotive Soft Termination Caps Qualified to AEC-Q200 (ST series)	X7R	0603, 0805	-55 TO +125°C / ±15%	1000pF~0.1μF	J, K, M	10V, 16V, 25V, 50V
Automotive Caps Without AEC-Q200 Certification (MG series)	NPO	0201, 0402, 0603, 0805 1206, 1210, 1812	-55 TO +125°C / ±30PPM/°C	0.1pF~0.047μF	B, C, D, F, G, J	10V, 16V, 25V, 50V, 100V, 250V, 500V, 630V, 1kV
	X7R	0201, 0402, 0603, 0805 1206, 1210, 1812	-55 TO +125°C / ±15%	100pF~2.2μF	J, K, M	10V, 16V, 25V, 50V, 100V, 250V, 500V, 630V, 1kV
	X5R	0402, 0603, 0805 1206, 1210	-55 TO +85°C / ±15%	0.056μF~10μF	K, M	6.3V, 10V, 16V, 25V
High Temperature Caps (HT series)	X8G	0402, 0603, 0805 1206, 1210	-55 to +150°C / ±30ppm/°C	0.2pF~0.015μF	A, B, C, D, F, G, J	10V, 16V, 25V, 50V, 100V
	X8R	0402, 0603, 0805	-55 to +150°C / ±15%	100pF~0.047μF	K, M	10V, 16V, 25V, 50V

* Tolerance: A (±0.05pF), B (±0.1pF), C (±0.25pF), D (±0.5pF), F (±1%), G (±2%), J (±5%), K (±10%), M (±20%), Z (-20/+80%)

Quick Product Information (Continuous)

Series	Dielectric	Size	TCC	Capacitance	Tolerance*	Rated voltage
Safety Certificated Caps X1/Y2 (S2 series)	NPO	1808, 1812, 2211	-55 TO +125°C / ±30PPM/°C	3pF~680pF	D, F, G, J	250Vac
	X7R	1808, 1812, 2220, 2211	-55 TO +125°C / ±15%	100pF~4700pF	K, M	250Vac
Safety Certificated Caps X2 (S3 series)	NPO	1808, 1812	-55 TO +125°C / ±30PPM/°C	3pF~1000pF	D, F, G, J	250Vac
	X7R	1808, 1812, 2220	-55 TO +125°C / ±15%	150pF~0.022μF	K, M	250Vac
Soft Termination Capacitors (SH series, Ag-poly)	NPO	0402, 0603, 0805,1206 1210, 1808, 1812,1825 2220,2225	-55 TO +125°C / ±30PPM/°C	0.1pF~0.1μF	B, C, D, F, G, J	10V, 16V, 25V, 50V, 100V, 200V, 250V, 500V, 630V, 1kV, 3kV
	X7R	0402, 0603, 0805,1206 1210, 1808, 1812,1825 2220,2225	-55 TO +125°C / ±15%	100pF~22μF	K, M	10V, 16V, 25V, 50V, 100V,200V, 250V, 500V, 630V, 1kV, 2kV, 3kV
Soft Termination Capacitors (SG series, Cu-poly)	X7R	0603, 0805, 1206	-55 TO +125°C / ±15%	100pF~1μF	K, M	10V, 16V, 25V, 50V, 100V,200V, 250V, 500V, 630V, 1kV, 2kV
Low Profile Caps (TT series)	X7R	0805, 1206, 1210	-55 TO +125°C / ±15%	1.0μF~10μF	K, M	10V, 16V, 25V, 50V,100V,
	X5R	0402, 0603, 0805 1206, 1210	-55 TO +85°C / ±15%	0.22μF~47μF	K, M	6.3V, 10V, 16V, 25V
	Y5V	0805, 1206, 1210	-25 TO +85°C / +30%/-80%	2.2μF~10μF	Z	10V, 16V, 25V, 50V
Feed Through (3-terminal) Caps (FT series)	X7R	0805	-55 TO +125°C / ±15%	10nF~1μF	M	16V, 25V, 50V

* Tolerance: A (±0.05pF), B (±0.1pF), C (±0.25pF), D (±0.5pF), F (±1%), G (±2%), J (±5%), K (±10%), M (±20%), Z (-20/+80%)

How to Order

Type of MLCC	0805		B	104	K	500	C	T
General Purpose MLCC Ultra-small MLCC Middle & High Voltage MLCC	Size		Dielectric	Capacitance	Tolerance	Rated voltage	Termination	Packaging
High Vol. Cap. with Surface Coating	Inch (mm) : 01R5(0402), 0201(0603), 0402(1005), 0603(1608), 0805(2012), 1206(3216), 1210(3225), 1808(4520), 1812(4532), 1825(4563), 2220(5750), 2225(5763)		N=NP0 G=X8G R=X8R B=X7R A=X7S S=X6S X=X5R F=Y5V	Two significant digits followed by no. of zeros. And R is in place of decimal point.	A= ±0.05pF B= ±0.1pF C= ±0.25pF D= ±0.5pF F= ±1% G= ±2% J= ±5% K= ±10% M= ±20% Z= -20/+80% P=±0.02pF** Q=±0.03pF*	Two significant digits followed by no. of zeros. And R is in place of decimal point. 4R0=4 Vdc 6R3=6.3 Vdc 100=10 Vdc 160=16 Vdc 250=25 Vdc 350=35 Vdc 500=50 Vdc 101=100 Vdc 201=200 Vdc 251=250 Vdc 401=400 Vdc 451=450 Vdc 501=500 Vdc 631=630 Vdc 102=1000 Vdc 152=1500 Vdc 202=2000 Vdc 252=2500 Vdc 302=3000 Vdc 402=4000 Vdc 502=5000 Vdc 602=6000 Vdc	C=Cu/Ni/Sn M= Cu/Ni/Sn Surface coating	T=7" reeled Q=10" reeled G=13" reeled
Microwave MLCC Microwave-Narrow Tolerance Microwave-High reliability Automotive High-Q MLCC High Q / Low ESR MLCC Automotive MLCC High Temperature MLCC. Safety Certificated MLCC Low Profile MLCC Feed Through MLCC	RF	03						
	Series RF=Microwave UF=Microwave-Narrow Tolerance RH=Microwave-High reliability RT=Automotive High Q Caps Qualified to AEC-Q200 HH=High Q/ Low ESR MT=Automotive Cap. Qualified to AEC-Q200 MG=Automotive Cap. without AEC-Q200 HT=High Temperature Cap. S2=X1/Y2 safety class S3=X2 safety class TT=Low profile FT=Feed Through(3-terminal)	Size Inch : 02=01005 03=0201 15=0402 11=0505 18=0603 21=0805 22=1111 31=1206 32=1210 42=1808 43=1812 52=2211 55=2220 56=2225		R47=0.47pF 0R5=0.5pF 1R0=1pF 100=10pF 101=100pF 102=1000pF 103=0.01uF 104=0.1uF 105=1uF 106=10uF 107=100uF				
Soft Termination MLCC	ST=Qualified to AEC-Q200 SH=With Ag polymer SG=With Cu polymer						C=Cu +Conductive resin /Ni /Sn	

* The packaging code per each size of reel, please refer to following table "packaging style and quantity".

** Tolerance "P" & "Q" only for UF series items.

Chip-Resistor

Quick Product Information

Function	Type	Size	Range	Tolerance
Standard	General Purpose	01005~2512	1Ω~10MΩ	1%,5% & Jumper
Array	Convex Type	0603x4, 0603x2, 0402x4, 0402x2, 0402x8	10Ω~1MΩ	1%,5% & Jumper
	Flat Type	0201x4, 0201x2	10Ω~1MΩ	1%,5% & Jumper
	Concave Type	0603x4,0402x4,0402x2	10Ω~1MΩ	1%,5% & Jumper
	Network	1206 (10P8R)	10Ω~100KΩ	5%
Current Sense Low Ohm	Thick Film	0201~2512	0.010Ω~0.976Ω	1%, 5%
	Thick Film High Power	0402~2512	0.010Ω~0.976Ω	1%, 5%
	Thick Film Wide Termination	0602~1215	0.1Ω ~ 0.976Ω	1%, 5%
	Metal Film Low Ohm	0402~2512	0.021Ω~0.900Ω	0.5%, 1%, 5%,
	Metal Foil Low Ohm	2512,1206, 0805, 0603, 0402	0.002Ω~0.700Ω	0.5%, 1%, 5%,
	Metal Plate Low Ohm	2512, 2010, 1206, 0805, 0603	0.001Ω~0.100Ω	1%, 5%
High Precision	Thick film (TC100)	0201~2512	10Ω~1.0MΩ	0.1%, 0.5%
	Thick film (TC50)	0201~1206	10Ω~1.0MΩ	0.1%, 0.5%
Specialty	High Voltage UL	0603~2512	100KΩ~100MΩ	1%, 5%
	Surge	0402~2512	0.27Ω~22MΩ	5%, 10%
	Triple Power Surge	0603~2512	1Ω ~ 1MΩ	1%, 5%
	High Power	0402~2512	1Ω ~ 1MΩ	1%, 5%
	Triple Power	0603, 0805, 1206, 1210, 2010, 2512	1Ω ~ 1MΩ	1%, 5%
	Attenuator	0404 (4p3R)	1dB ~ 20dB	0.2dB, 0.3dB, 0.5dB, 1dB
	High Ohm	0402	11MΩ~ 33MΩ	1%, 5%
	Ultra High Ohm	0603~1206	11MΩ~100MΩ	1%, 5%
	Gold Termination	0402~1206	10Ω~1.0MΩ	1%, 5%
	Trimable	0402~2512	1Ω~10MΩ	0/-20%, 0/-30%
	Wide Termination	0602~1215	1Ω ~ 1MΩ	1%, 5%
Pb <100ppm	General Purpose	01005~2512	1Ω~10MΩ	1%,5% & Jumper
	Array	0603x4, 0402x4, 0402x2	10Ω~1MΩ	1%,5% & Jumper
	High Power	0402~2512	1Ω~1MΩ	1%,5% & Jumper
Automotive	High Grade General Purpose	0201~2512	1Ω~10MΩ	1%,5% & Jumper
Anti-sulfur	High Grade General Purpose	0402~2512	1Ω~10MΩ	1%,5% & Jumper

Thin Film

Function	Type	Size	Range	TCR (ppm/°C)	Tolerance
High Precision	High Precision (TC2, 3, 5)	0201~2512	4,7Ω~600KΩ	2, 3, 5 ppm/°C	0.01%, 0.02%, 0.05% , 0.1%, 0.25%, 0.5%, 1%
	High Precision (TC10, 15)	0201~2512	4,7Ω ~ 3MΩ	10, 15 ppm/°C	
	High Power High Precision (TC10, 15)	0201~2512	4,7Ω ~ 1.5MΩ	10, 15 ppm/°C	
	High Power High Precision (TC25, 50)	0201~2512	1Ω ~ 1.5MΩ	25, 50 ppm/°C	
	High Precision (TC25, 50)	0201~2512	1Ω ~ 3MΩ	25, 50 ppm/°C	
High Precision NiCrAl AEC-Q200	Automotive (TC5)	0402~2512	1Ω ~600KΩ	5 ppm/°C	0.05% ,0.1%, 0.25%, 0.5%, 1%
	Automotive (TC10, 15)	0402~2512	4,7Ω~1.5MΩ	10, 15 ppm/°C	
	Automotive (TC25, 50)	0402~2512	4,7Ω~3MΩ	25, 50 ppm/°C	
High Precision TaN AEC-Q200	Automotive High Stability (TC10,15)	0402~1206	10Ω~1MΩ	10, 15 ppm/°C *	0.05%, 0.1%, 0.25%, 0.5%, 1%
	Automotive High Stability (TC25, 50)	0402~1206	10Ω~1MΩ	25, 50 ppm/°C	0.05%, 0.1%, 0.25%, 0.5%, 1%
Anti-Sulfuration	High Precision (TC25, 50)	0402~2512	4,7Ω~3MΩ	25, 50 ppm/°C	0.05% *, 0.1%, 0.25%, 0.5%, 1%
Anti-Sulfuration AEC-Q200	Automotive High Precision (TC25, 50)	0402~2512	4,7Ω~1.5MΩ	25, 50 ppm/°C	0.05% *, 0.1%, 0.25%, 0.5%, 1%
Array Convex	High Precision	0603x4R	4,7Ω~200KΩ	25, 50 ppm/°C	0.1%, 0.25%, 0.5%, 1%
Current Sensing Low Ohm	Current Sense TC75, 100	0402~2512	0,021Ω~0,9Ω	75, 100 ppm/°C	0.5%, 1%, 5%

* Available Upon Request

How To Order

Type code	Size code	Functional code	Resistance	Tolerance	Packaging code	Termination code
WR	12	X	1000	F	T	L
WR : General 1~10MR MR : Automotive SR : Anti-Sulfuration ZR : Non magnetic	25 : 2512 (6432) 20 : 2010 (5025) 18 : 1218 (3248) 12 : 1206 (3216) 10 : 1210 (3225) 08 : 0805 (2012) 06 : 0603 (1608) 04 : 0402 (1005) 02 : 0201 (0603) 01 : 01005 (0402)	X : 5% for 1 ~ 10MΩ, 1% for 10 ~ 1MΩ W : 1% for <10Ω and >1MΩ F : TC100, 1-10ohm 1% E : TC100, 100-1Mohm 5%	E24 (J tol.) E24+E96 (F tol.) *Please see remark for detail explanation	F : ± 1% J : ± 5% P : Jumper X : random	P : 4" reel taping T : 7" reel taping A : 7" reel taping 15Kpcs D : 7" reel taping 20Kpcs E : 7" up side down taping V : 7" reel taping 1Kpcs Q : 10" reel taping G : 13" reel taping H : 0402-50K/13" reel R : 0603 2mm pitch 7" reel B : Bulk C : Bulk after measuring F : 0402 1mm pitch (30k/ 7" reel) K : 10" reel taping (0402 30K/RL) J : 10" reel taping (0402 40K/RL) I : 13" up side down taping L : 01005 1mm pitch (35K/7" RL)	L= Sn base (Lead free) R= Pb ≤100ppm (total) W= Wide term. A= Anti-leaching P= 20% Pd
WW	12	M	R002	F	T	L
WW : R < 1Ω	25 : 2512 (6432) 20 : 2010 (5025) 18 : 1218 (3248) 12 : 1206 (3216) 10 : 1210 (3225) 08 : 0805 (2012) 06 : 0603 (1608) 04 : 0402 (1005)	X : Thick film low ohm (WTC) W : Thick film low TCR Hi-power Q : Metal low ohm M : Metal low ohm R : Metal low ohm high power N : Metal low ohm high power P : Thick film low TCR high Power 2512 = 2W; 2010 = 1W 1210 = 0.5W; 1206 = 0.5W C : Thick film Power low ohm low TCR, up side down D : Metal Foil E : Thick film Power low ohm A : Metal low ohm NiCu 2512 3W B : Metal low ohm MnCu 2512 3W J : Metal low ohm low EMF K : Metal low ohm low EMF L : Thick film wide term. High power T : Thick film triple power WW25T 3W	R followed by 3 significant digits e.g : 0.1Ω = R100 0.033Ω = R033 0.56Ω = R560 0.5mΩ = R0L5 15.5mΩ = 15L5	F : ± 1% G : ± 2% J : ± 5%	P : 4" reel taping T : 7" reel taping Q : 10" reel taping G : 13" reel taping R : 0603 2mm pitch taping B : Bulk U : 7" reel taping (4kpcs/RL) Z : 7" reel taping (3kpcs/RL)	L= Sn base (Lead free) G= Au base S= Ag base
WF/WK	12	T	1001	B	T	L
WF: Special Function SF: Special Function Anti-Sulfur WK: Special function Made in KM	25 : 2512 (6432) 20 : 2010 (5025) 18 : 1218 (3248) 12 : 1206 (3216) 10 : 1210 (3225) 08 : 0805 (2012) 06 : 0603 (1608) 04 : 0402 (1005)	G : High ohm (>10MΩ) H : Thick film, High Precision <1% K : Thick film, TCR50ppm M : Trimmable P : High Power S : Surge V : High voltage N : Ultra High voltage (WFxxN for UL) X : Special resistance Y : E24/E96 resistance with special Termination A : Triple Power 2512 3W E : Triple power + Surge	E24 (J tol.) E24+E96 (F tol.) *Please see remark for detail explanation	T : ± 0.01% U : ± 0.02% A : ± 0.05% B : ± 0.1% C : ± 0.25% D : ± 0.5% F : ± 1% G : ± 2% J : ± 5% K : ± 10% L : ± 15% M : ± 20% P : Jumper X : 0/-30% Y : 0/-20% Z : 0/-10%	P : 4" reel taping T : 7" reel taping Q : 10" reel taping M : 10" reel taping 4Kpc/RL G : 13" reel taping R : 0603 2mm pitch taping B : Bulk D : 7" reel taping 20Kpcs V : 7" reel taping 1Kpcs A : 7" reel taping 15Kpcs W : 7" reel taping 2Kpcs Z : 7" reel taping (3kpcs/RL)	L= Sn base (Lead free) G= Au base S= Ag base C= Cu base D= Cu base + Low profile N= Narrow termination
WA	04	X	103_	J	T	L
WA : Array MA : Array Automotive SA : Array Anti-Sulfur TA : Thin Film Array Convex	06 : 0603 (1608) 04 : 0402 (1005) 02 : 0201 (0603)	X : *4, convex Y : *2, convex W : *8, convex T : *4, concave U : *2, concave P : *3, convex (Attenuator) A : *4, FLAT B : *2, FLAT F : *4, Reverse FLAT G : *2, Reverse FLAT	E24 (J tol.) E24+E96 (F tol.) **Please see remark for detail explanation	F : ± 1% J : ± 5% P : Jumper B : ± 0.1% C : ± 0.25% D : ± 0.5%	T : 7" reel taping A : 7" reel taping 15Kpcs Q : 10" reel taping G : 13" reel taping B : Bulk	L= Sn base (Lead free)
WT	04	X	103_	J	T	L
T : Network Resistors	04 : total package size 1206 (3216)	X : *8, convex	E24 (J tol.)	J : ± 5% P : Jumper	T : 7" reel taping B : Bulk	L= Sn base (Lead free)

Thin Film Series: Precision; High Precision; Auto Grade; MELF ; Current Sensing Resistor

Type code	Size code	Functional code	Resistance	Tolerance	Packaging code	Termination code	Special code
WF/SF/MF	12	T	1001	B	T	L	Q
WF: Thin Film Precision SF: Thin Film Anti-Sulfuration WF_Q: High Precision Thin Film AEC-Q200 Compliant SF_Q: Thin Film Anti-Sulfuration/ AEC-Q200 Compliant ASTM B809 SF_A: High Precision Thin Film Anti-Sulfuration ASTM B809 +Under Oil 105°C +3.5% Sulfur power 500hrs MF: Precision Thin Film Auto Grade AEC-Q200 Qualified ASTM-B809	25 : 2512 (6432) 20 : 2010 (5025) 12 : 1206 (3216) 10 : 1210 (3225) 08 : 0805 (2012) 06 : 0603 (1608) 04 : 0402 (1005) 02 : 0201 (0603)	T : TCR 50 ppm U : TCR 25 ppm Q : TCR 50 ppm, Power R : TCR 25 ppm, Power F : Low TCR 15 ppm W : Low TCR 10 ppm Z : Ultra Low TCR 5 ppm B : Ultra Low TCR 3 ppm C : Ultra Low TCR 2 ppm D : Ultra Low TCR 1 ppm * * Available Upon Request	E24+E192 **Please see remark for detail explanation	T : ± 0.01% U : ± 0.02% A : ± 0.05% B : ± 0.1% C : ± 0.25% D : ± 0.5% F : ± 1%	T : 7" Reel &Taped Q : 10" Reel &Taped G : 13" Reel &Taped V : 7" Reel &Taped 1Kpcs B : Bulk	L= Sn base (Lead free)	Q= AEC-Q200 Compliant A= Under Oil 105°C+3.5% Sulfur power 500 hrs S= Low Resistance Pulse withstanding
TA	06	M	xxxx	D	T	L	T
TA : Thin Film Array /Networks Convex	06 : 0603 (1608)	M : *4, TCR 50ppm N : *4, TCR 25ppm	E24+E192 **Please see remark for detail explanation	F : ±1% D : ±0.5% C : ±0.25% B : ±0.1%	T : Reeled	L= Sn base (Lead free)	D : Equal values B : Two pairs T : Different Values
WM_Q / MM / WM	04	C	1002	B	T	L	Q
WM: MELF Thin Film , AEC-Q200 Compliant	04 (0204) 07 (0207)	B : TCR 50 ppm C : TCR 25 ppm N : TCR 50 ppm, Power O : TCR 25 ppm, Power D : Low TCR 15 ppm E : Low TCR 10 ppm P : Low TCR 15 ppm, Power Q : Low TCR 10 ppm, Power	E24+E192 **Please see remark for detail explanation	B : ± 0.1% C : ± 0.25% D : ± 0.5% F : ± 1%	T : 7" Reel &Taped	L= Sn base (Lead free)	Q= AEC-Q200 Compliant

Type code	Size code	Functional code	Resistance	Tolerance	Packaging code	Termination code
TTL	12	Q (Power Rating) N (TCR)	XXXX	F	T	L
TTL: Thin Film Foil Current Sensor (High Power /Low TCR)	25 : 2512 (6432) 12 : 1206 (3216) 08 : 0805 (2012) 06 : 0603 (1608) 04 : 0402 (1005)	Q: 2W P: 1W M: 1/2W K: 1/3W J: 1/4W I: 1/5W H: 1/8W G: 1/10W N: 50 ppm O : 75 ppm P : 100 ppm Q :150 ppm R : 200 ppm U : 350 ppm	e.g.: R020 = 20mΩ R0050 = 5mΩ R2L5 = 2.5mΩ	D : ± 0.5% F : ± 1% G : ± 2% J : ± 5%	T : 7" Reel & Taped	L= Sn base (Lead free)
WW	12	F (TCR)	XXXX	F	T	L
WW: Low Ohmic Thin Film Current Sensor (>20mR ~900m)	25 : 2512 (6432) 20 : 2010 (5025) 12 : 1206 (3216) 08 : 0805 (2012) 06 : 0603 (1608) 04 : 0402 (1005)	F: 75 ppm G:100ppm H:75 ppm, High Power	e.g.: R100= 100mΩ R050= 50mΩ	D : ± 0.5% F : ± 1% G : ± 2% J : ± 5%	T : 7" Reel & Taped	L= Sn base (Lead free)

Remark:

1. Detail product part number, functional code, tolerance combination; please refer to specific data sheet.
2. E24 (J tol.): 2 significant digits followed by No. of zeros and a blank, e.g.: 3ohm = 3R0_, 10ohm = 100_, 220ohm = 221_, 56Kohm = 563_, ("_" means blank).
3. E24+E192 (F tol.): 3 significant digits followed by No. of zeros, e.g.: 3Ω = 3R00, 10Ω = 10R0, 220Ω = 2200, 56KΩ = 5602.
4. Example: ("_" means a blank)
Chip-R 0805 size, 4.3ohm, 5%, Normal type, SnPb termination, 5000pcs taped in reel: WR08X4R3_JTL
5. 1218 standard packing Q'ty is 3Kpcs in 10" reel and packing code is T code

Safety Standard Ceramic Capacitor

SAP Part Number Explanation

To order, please also specify Pan Overseas Part No. as the following example for SAP system :

YV	0AC	472	M	10	0	L	20	C	7	H
1	2	3	4	5	6	7	8	9	10	11

1. Temperature characteristic (identified code):

CODE	SL	YP (Y5P)	YU (Y5U)	YV (Y5V)
Cap. Change (%)	-1000~+350ppm/°C(+20°C~+85°C)	±10%	+20%to -55%	+30%to -80%

2. TYPE (identified by 3-figure code):

0AC=AC(X1-400V~/Y2-250V~); 1AC=AC(X1-440V~/Y2-300V~)
 0AH=AH(X1-400V~/Y1-250V~); 1AH=AH(X1-400V~/Y1-400V~)
 0AS=AS(X1-760V~/Y1-500V~) (Only approval for VDE//ENEC/UL/CUL/CQC)

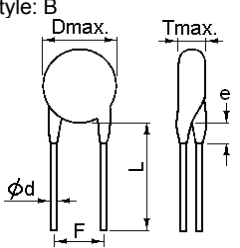
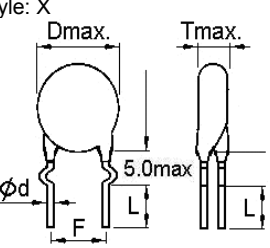
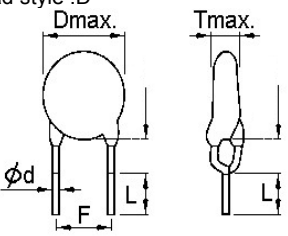
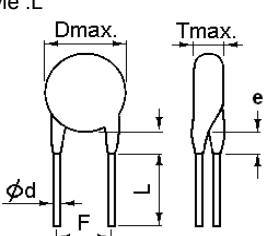
3. Capacitance (identified by 3-figure code)

4. Capacitance tolerance (identified by code)

5. Nominal body diameter dimension (identified by 2-figure code)

6. Internal control code:0—Normal, other code—Special control

7. Lead Style:

Lead type & Code	Lead Configuration	Lead type & Code	Lead Configuration
Type B Straight lead for taping	Lead style: B 	Type X Outside kink lead	Lead style: X 
Type D Vertical kink short lead	Lead style: D 	Type L Straight lead for bulk	Lead style: L 

8. Packing mode and lead length (identified by 2-figure code)

Bulk Code	Description
3E	lead length L : 3.5mm
04	lead length L : 4.0mm
4E	lead length L : 4.5mm
20	lead length L : 20mm

Taping Code	Description
AM	Box and Pitch : 25.4 mm (10.0mm)
AF	Box and Pitch : 15.0 mm (Pitch=7.5mm)
AS	Box and Pitch : 15.0 mm (Pitch=10mm)

9. Length tolerance

Code	Description
A	±0.5 mm (only for kink lead type)
B	±1.0 mm
C	MIN.
D	Taping special purpose

10. Pitch

Code	Description
7	7.5±1.0 mm
M	7.5±0.5 mm
0	10±1.0 mm
A	10±0.5 mm

11. Epoxy Resin Code

Code	Description
H	Halogen and Pb free, epoxy resin (Ag electrode)

Safety Standard Ceramic Capacitor

AH and AS Type-Class X1/Y1; AC Type-Class X1/Y2

Introduction

Ideal for use as X/Y capacitors for AC line filters and primary-secondary coupling on switching power Supplies and AC adapters applications. Having internationally recognized safety certifications, these capacitors are well-suited for applications that require keeping potentially disruptive or damaging line transients and EMI out of susceptible equipment.

They are also an ideal solution in situations where there is a need to suppress line disturbances at the power.

Features

- Compact size
- Cost effective products
- Ideal for across the line applications
- Safety Standard Recognized for AC applications
- Coated with flame-retardant epoxy resin (equivalent to UL94V-0 standards)
- RoHS Compliance
- Halogen free products are available



Approval standards

Agencies	UL/cUL	CSA	CQC	KTL	VDE,ENEC, SEMKO, NEMKO, DEMKO, FIMKO, SEV
Standard No.	ANSI/UL 60384-14 (2nd ed.)	E60384-14:14	IEC60384-14: 2013	KC60384-14	IEC60384-14 4 th Edition
Rated Voltage	0AC = AC(X1:400V~/Y2:250V~) 1AC = AC(X1:440V~/Y2:300V~) 0AH = AH(X1:400V~/Y1:250V~) 1AH = AH(X1:400V~/Y1:400V~) 0AS = AS(X1:760V~/Y1:500V~)				

General specification

Capacitance Range	AH:10pF to 4700pF; AC:10pF to 10000pF; AS: 100pF to 4700pF
Capacitance Tolerance	±5%, ±10%, ±20%
Operating Temperature Range	-40°C~ +125°C
Temperature Coefficient (ΔC Max)	-1000~+350ppm/°C(SL), ±10% (Y5P), +30 ~80% (Y5V), +20~55% (Y5U)
Voltage Resistance	AH Type: X1:400Vac / Y1:400Vac or 250Vac ; AC Type: X1:400Vac or 440Vac / Y2:250VAC or 300Vac AS Type: X1:760Vac / Y1:500Vac
Dissipation Factor(tanδ) or Q	SL: 30pF&above:Q≥1000 Below 30pF:Q≥400+20×C @20°C, 1MHz, 1±0.2Vrms Y5P: tanδ=2.5% Max. @20°C, 1KHz, 1±0.2Vrms Y5U: tanδ=2.5% Max. @20°C, 1KHz, 1±0.2Vrms Y5V: tanδ=5.0% Max. @20°C, 1KHz, 1±0.2Vrms
Insulation Resistance	10000MΩ at 500VDC for 60 Seconds
Dielectric Strength	2600VAC for 60 Seconds (AC TYPE) (For Lead Pitch=7.5 & 10 mm)
	4000VAC for 60 Seconds (AH,AS TYPE) (For Lead Pitch=10.0mm & 12.5mm)

Ceramic Capacitor

Part Number Explanation

To order, please also specify Pan Overseas Part No. as the following example for SAP system :

YP	102	102	K	060	B	20	C	5	H
Dielectric Code	Voltage Code	Capacitance Code	Tolerance Code	Diameter Code	Lead Style	Length or Packing	Length Tolerance	Pitch	Coating
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩

① Dielectric Code

CLASS I:		CLASS II:	
CODE	T.C. (ppm/°C)	CODE	T.C. (ΔC%)
SL	SL (-1000 ~ +350) (+20°C to +85°C)	YP	Y5P (±10%)
		ZU	Z5U (+22 ~ -56%)
		ZV	Z5V (+22 ~ -82%)
		YU	Y5U (+22 ~ -56%)
		YV	Y5V (+22 ~ -82%)

② Voltage Code

CODE	WV
500	50 VDC
501	500 VDC
102	1KVDC
202	2KVDC
302	3KVDC
602	6KVDC

③ Capacitance Code

CODE	Capacitance
100	10 pF
101	100 pF
102	1000 pF
472	4700 pF
103	0.01uF

⑤ Diameter Code

CODE	Diameter max
040	Refer to the product diameter D max
050	
060	
070	
080	
090	
100	
110	
120	
130	
140	

⑥ Lead Style-Reference Lead Style

⑦ Packing / Pitch / Lead Length

Taping(ex)	
CODE	Packing & Pitch
AF	Ammo Box & Pitch 15.0 mm
AN	Ammo Box & Pitch 12.7 mm
AM	Ammo Box & Pitch 25.4 mm
Bulk (ex)	
CODE	Length
3E	3.5mm
04	4.0mm
4E	4.5mm
05	5.0mm
20	20.0mm

④ Tolerance Code

CODE	Tolerance
J	± 5%
K	± 10%
M	± 20%
Z	-20 ~ +80 %

⑧ Length Tolerance

CODE	Length Tolerance
A	± 0.5 mm (Only for short kink lead type)
B	± 1.0 mm
C	Min.
D	Tapping & Special Purpose

⑨ Pitch

CODE	Length Pitch
2	2.5±0.8mm
5	5.0±0.8mm (for Bulk)
	5.0+0.8-0.2mm (for Taping)
7	7.5 ± 1mm
0	10.0 ± 1mm

⑩ Coating Type

CODE	Coating
A	Phenolic resin Halogen free and Pb free
H	Epoxy resin Halogen free and Pb free

Ceramic Disc Capacitor

CLASS I 50V, 100V, 500V, 1KV, 2KV, 3KV, 6KV TEMPERATURE COMPENSATION TYPE

Features

- Capacitance has linear temperature coefficient
- Capacitance high stability
- Epoxy Coating for 1KV, 2KV, 3KV, 6KV parts (equivalent to UL94V-0 standards)
- RoHS Compliance
- Halogen free products are available
- Low loss at wide range of frequency

Capacitance Range	15~820 pF
Capacitance Tolerance	±5%
Operating Temperature Range	-25°C ~ +125°C.
Rated Voltage	50,100, 500, 1000, 2000, 3000 ,6000 VDC
Q Factor @ 1MHz, 1±0.2 Vrms, 25°C	C≥30 pF.....Q≥1,000, C < 30 pF.....Q≥400+20*°C
Insulation Resistance (IR) @ 25°C	10,000 MΩ Minimum
Dielectric Strength	50~500VDC:3 times the rated WVDC ; 1K, 2K, 3KVDC:2 times the rated WVDC; 6KVDC:1.5 times the rated WVDC.
Testing Parameters	1MHz ±20%, 1.0Vrms±0.2Vrms

CLASS II 50V, 100V, 500V, 1KV, 2KV, 3KV Hi-K TYPE

Features

- Capacitance has non-linear temperature coefficient.
- Large capacitance in small size.
- Epoxy Coating for 1KV, 2KV and 3KV parts (equivalent to UL94V-0 standards).
- RoHS Compliance.
- Halogen free products are available.
- Wide range of general purposes applications.

Capacitance Range	100pF to 22000pF
Capacitance Tolerance	±10%(for Y5P), ±20%(for Z5U), +80% -20%(for Z5U&Z5V&Y5V)
Operating Temperature Range	-25°C~ +85°C(Y5P,Y5V) ; 10°C~ +85°C(Z5U, Z5V)
Rated Voltage	50,100, 500,1000, 2000, 3000VDC
Dissipation Factor (tan δ)	Y5P, Z5U, Y5U : tanδ≤2.5%, Z5V, Y5V : tanδ≤5.0%
Insulation Resistance (IR) @ 25°C	10,000 MΩMinimum or 200 MΩμF whichever is smaller
Dielectric Strength	50~500VDC: 2.5 times the rated WVDC; 1K, 2K, 3KVDC: 2 times the rated WVDC
Testing Parameters	1KHz ±20%, 1.0Vrms±0.2Vrms

Radial Leaded Multilayer Ceramic Capacitor

Features

- MLC Radial Lead Capacitor (RD) has wide application in computer, data processing, telecommunication, industrial control and instrumentation equipment.
- The radial lead MLC is built with superior moisture, and shock resistant epoxy coating material, can be supplied in both, bulk or taping form for automatic insertion.
- RoHS compliance.
- Halogen free products are available.

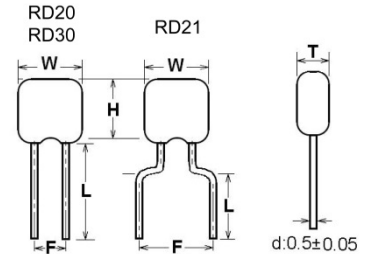
SAP Part Number Explanation

RD21	B		102	K	500	B	5	H	07	B
Product Type	Dielectric Code		Capacitance Code	Tolerance Code	Rated Voltage	Packaging Code	Chip Size	Termination	Lead length	Length Tolerance
RD21 RD20 RD30	Code	T.C	1R0=1pF 1R5=1.5pF 100=10pF 101=100pF 102=1000pF 472=4700pF 103=10000pF 104=100000pF	D=±0.5pF J=±5% K=±10% M=±20% Z=+80%/-20%	100=10V 160=16V 250=25V 500=50V 101=100V 201=200V 251=250V 501=500V 631=630V 102=1000V 202=2000V 302=3000V	A=Ammo B=Bulk	5=0805 6=1206 0=1210 2=1812 8=1808	H= Cu/Ni/Sn Halogen free	Tapping: AN=Ammo Bulk 07=7.0 mm 3E=3.5 mm 05=5.0 mm	D= Taping A=±0.5mm B=±1mm
	N	NPO								
	B	X7R								
	F	Y5V								

Lead Configuration And Dimension

(Unit: mm)

Size		Width (W) Max.	Height (H)Max.	Height (H1)Max	Length (L)	Lead spacing for Taping (F)	Lead spacing for Bulk (F)	Lead Diameter (d)
RD20	0805	5.0	4.5	6.0	Refer to the item SAP Part Number	2.5±1.0	2.54±1.0	0.5±0.05
RD21	0805	5.0	4.5	6.5		5.0±1.0	5.08±1.0	
	1206	6.5	5.0	7.0				
	1210	6.5	5.5	7.5				
RD30	1808	8.0	6.0	7.5		5.0±1.0	5.08±1.0	
	1812	8.0	6.5	8.0				



General Electrical Data

Dielectric	NP0	X7R	Y5V
Size	RD20: 0805 RD21: 0805, 1206, 1210 RD30: 1808 and 1812		
Capacitance range	1.0pF to 0.1uF	100pF to 4.7uF	0.01μF to 22uF
Capacitance Tolerance	J: ± 5%, K: ± 10%, M: ± 20%, Z: +80% / -20%		
Rated Voltage (WVDC)	50V, 100V, 200V, 250V, 500V, 630V, 1000V, 2000V	50V, 100V, 200V, 250V, 500V, 630V, 1000V, 2000V, 3000V	10V, 16V, 25V, 50V, 100V, 200V, 250V
Operating Temperature	-55~+125°C	-55~+125°C	-25~+85°C
Capacitance characteristic	0 ± 30 (ppm/°C)	± 15%	+30% ~ -80%
Termination	H=Cu/Ni/Sn Halogen free		

Metal Oxide Varistor (MOV)

How To Order

SR	241	K	10	D	S	20C	7	E	E	N
Type Code	Varistor Voltage	Tolerance	Disk Size code	Disk type	Lead style	Lead Cutting & Taping Code	Lead space + Tol. (mm)	Lead Material (mm)	Coating	Special code
SR: Walsin Varistor	(DC volt) (From 180 to 112) Two significant digits Followed by no. of zeros 180=18volt 101=100volt 102=1000volt	J :±10% K :±10%	05:5mm 07:7mm 10:10mm 14:14mm 18:18mm 20:20mm 25:25mm	D:Standard E:High Energy	S: Straight Lead L: Inline Crimped O: Outward Crimped I: Inward Crimped	Taping AND:P=12.7mm, Ammo AMD:P=25.4mm, Ammo TND:P=12.7mm, Reel AMD:P=25.4mm, Reel Bulk 20C:20mm Min 3EA:3.5±0.5mm 05A:5.0±0.5mm	5:5.0±0.5 E:5.0±0.8 F:5.0±1.0 7:7.5±0.5 M:7.5±0.8 N:7.5±1.0 R:10.0±0.5 O:10.0±1.0 T:10.0±0.8	A:0.6 CU wire B:0.8 CU wire C:1.0 CU wire D:0.6 CP wire E:0.8 CP wire F:1.0 CP wire	E:Epoxy coating S:Silicon coating	N:N/A

General Characteristics

Storage Temperature	-40°C to +125°C
Operating Surface Temperature	125°C
Operating Ambient Temperature	-40°C to +85°C (without derating)
Maximum Voltage - Temperature Coefficient	< -0.05% / °C
Insulation Resistance	1000 Mega-ohm minimum
Hi Pot (Leads To Case, 1 Min.)	2500 VAC
Typical Response Time	<25 Nano-seconds
Epoxy Rating	94V-0
Current / Energy Derating (>85°C)	-2.5% / °C
DC Leakage Current	200µA maximum (at rated DC working voltage)
Solderability	MIL-STD-202F

Power Dissipation Ratings(P, in-watts) :

Disc Size	11Vac~40Vac	50Vac~680Vac
5mm	0.01	0.15
7mm	0.02	0.25
10mm	0.05	0.4
14mm	0.1	0.6
18mm	--	0.8
20mm	0.2	1.0
25mm	--	1.2
32mm	--	1.6
34mm(single)	--	2.1
34mm(dual)	--	2.73
40mm	--	2.1
53mm	--	2.5

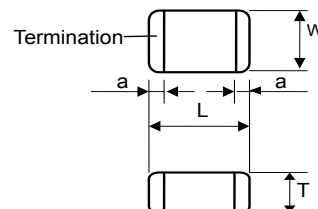
Multilayer Chip Varistor (MLV)

Introduction-Plated & Lead-Free Termination

High Speed ESD Voltage Suppressor is an advanced series of Walsin's Multilayer Chip Varistor (MLV). Nowadays, more and more communication devices become compact and apply denser and higher frequency circuits inside. Protection against the electronic static discharge (ESD) generated from human body transient voltage surge is more important when downsize of high-speed transistor makes its vulnerability to ESD and surge. Walsin's High Speed ESD Voltage Suppressor provides protection from ESD and EFT in high-speed data line and radio frequency (RF) circuits. Also, if capacitance of MLV is a concern to circuit designers, Walsin MLV H Series would supply a solution, MLV with specified capacitance and range. It is compatible with modern reflow and wave soldering procedures. We would give you a solution to transient over voltage and ESD protection to your products.

Features

1. Multilayer Fabrication Technology
2. Chip Size 0201, 0402, 0603, 0805, 1206, 1210, 1812, 2220 Available
3. -40°C to +125°C Operating Temperature Range
4. Operating Voltage Range (DC) from 2.5V~127V
5. Able to withstand high surge current
6. Bi-directional Clamping Characteristic
7. Low Capacitance Chip Varistor Types Available
8. Environmentally conscious design
9. Protection against automotive related transient overvoltage



Size	0201	0402	0603	0805	1206	1210	1812	2220
L	0.60 ± 0.05	0.96±0.14	1.60±0.15	2.00±0.20	3.20±0.30	3.20±0.20	4.50±0.20	5.70±0.20
W	0.30 ± 0.05	0.50±0.10	0.80±0.15	1.25±0.20	1.60±0.20	2.50±0.20	3.20±0.20	5.00±0.20
T	0.30 ± 0.05	0.50±0.10	0.90±0.15	1.20(max.)	1.70(max.)	1.50(max.)	2.00(max.)	2.50(max.)
a	0.20 ± 0.10	0.25±0.15	0.30±0.20	0.50±0.30	0.60±0.35	0.50±0.20	0.50±0.30	0.50±0.30

Unit: mm

For ESD Protection at High Speed Applications

VH	0201	M	050	C	G	T	330	N
Type Code	Chip Size	Style	Rated Voltage	Control Code	Termination	Packing	Capacitance Code (pF)	Internal Code
Walsin Varistor for High Speed	0201 0402 0603	M:Multilayer	050 = 5.5V 120 = 12V	C: Capacitance control code for ESD protection varistor	G:Green Material	T: Reeled B: Bulk	Two significant digits followed by number of zeros 2R5 = 2.5pF (when C< 10pF) 100 = 10 x 10 ⁰ = 10pF 220 = 22 x 10 ⁰ = 22pF 560 = 56 x 10 ⁰ = 56pF 101 = 10 x 10 ¹ = 100pF	Blank: None N: New item

For Surge & ESD Protection

VZ	0402	M	050	A	G	T	N
Type Code	Chip Size	Style	Rated Voltage	Surge Current	Termination	Packing	Internal Code
Walsin Varistor For Surge Protection	0402 0603 0805 1206 1210 1812 2220	M: Multilayer	050 = 5.5V 070 = 7V 090 = 9V 140 = 14V 180 = 18V 260 = 26V	A: Standard C: High Current M: Low Current S: Super High Current	G: Green Material	T: Reeled	Blank: None N: New item

For Automotive Applications

VA	0603	M	110	A	G	T	500
Type Code	Chip Size	Style	Rated Voltage	Surge Current	Termination	Packing	Typical Capacitance
Walsin Varistor For automotive Applications	0402 0603 0805 1206	M: Multilayer	050 = 5.5V 070 = 7V 090 = 9V 140 = 14V 180 = 18V	A: Standard C: High Surge	G: Green Material	T: Reeled	500: 50×100=50 121: 12×101=120

Inductor

Part Number Explanation and Coding Rule

WL	CM	1608	Z0	G	1N2	I	B
1	2	3	4	5	6	7	8

1. Category	Code	Description
	WL	Inductor/ Bead / RF Products
	WT	Transformer / Balun /Common Mode Choke
	WQ	Inductor (AEC-Q200)

2. Series	Code	Description
a. RF Inductor	CW	Ceramic Wire Wound Chip Inductor
	AC	SMD Air Wound Coil
	QC	SMD Square Air Wound Coil
	CM	Multi-Layer Ceramic High Frequency
	FI	Ferrite Chip Inductor
b. Signal & Noise	BD	Chip Bead
	FW	Wire Wound Ferrite Chip Inductor
	CF	Common Mode Choke
	BL	Balun Transformer
	FM	Multilayer Power Inductor
c. Power Inductor	PM	SMD Molded Power Inductor
	PH	SMD Molded Power Inductor
	SN	SMD Unshielded Wire Wound Power Inductor
	SS	SMD Assembly Wire Wound Power Inductor
	PN	SMD Shielded Wire Wound Power Inductor

3. Dimension	Code	Description
a. Size	4532	EIA 1812
	4516	EIA 1806
	3225	EIA 1210
	3216	EIA 1206
	1608	EIA 0603
	1005	EIA 0402
	0603	EIA 0201
	0402	EIA 01005
b. Others	Code	Description
	2520	2.5mm*2.0mm
	4040	4.0mm*4.0mm
	075D	7.8mm*7.0mm
	A0B0	10.0mm*11.0mm

A:10 ,B:11

4. Series extension 系列擴充碼	Code	Description
a. Series Extension	Z0 & K2 & A0	Refer to Datasheet
b. Dimension Height (Detail in Datasheet)	18	1.8mm

5. Tolerance:	Code	Description
	B	± 0.1nH
	C	± 0.2nH
	S	± 0.3nH
	W	± 0.5nH
	G	± 2%
	H	± 3%
	J	± 5%
	K	± 10%
	M	± 20%
	N	± 30%
	U	± 25%

6. Value:	Code	Description
	1N2	1.2nH
	12N	12nH
	R12	120nH=0.12uH
	1R2	1.2uH / OHM
	120 / 12R	12uH / OHM
	121	120uH / OHM
	122	1200uH / OHM

OHM: Unit for WLBD WTCF

Series No. For WTBL

7. Packing	Code	Description
	T	7" Paper Tape
	P	7" Embossed Tape
	L	13" Embossed Tape

8. Spare	Code	Description
	B & P & C	General /STD
	S & H	High Current
	Y	Low DCR

Quick Product Information

Application	Type	Series	Range	Size (mm)			Quantity per reel
				L	W	H	
RF Inductor	Wire Wound Ceramic Chip Inductor (AEC-Q200)	(WQ) WLCW1005	1nH ~ 120nH	1.19	0.64	0.66	4K
		WLCW1005CF	1.5nH ~ 120nH	1	0.5	0.5	10K
		(WQ) WLCW1608	1.6nH ~ 470nH	1.8	1.12	1.02	4K
		WLCW1608HQ	1.8nH ~ 390nH	1.7	1.02	0.9	4K
		(WQ) WLCW2012	2.2nH ~ 4700nH	2.29	1.73	1.52	3K
		WLCW2012HQ	2.5nH ~ 51nH	2.4	1.65	1.45	3K
		(WQ) WLCW2520	8.2nH ~ 15000nH	2.92	2.79	2.02 / 2.10	2K
		WLCW2520HQ	3nH ~ 100nH	2.92	2.7	2.79	2K
		(WQ) WLCW3225	4.7nH ~ 3300nH	3.42	2.3	2.8	1.5K
		(WQ) WLCW4532	82nH ~ 1200nH	4.55	3.23	3.61	0.6K
	Multi-Layer High Frequency	(WQ)WLCM0603	0.3nH ~ 100nH	0.6	0.3	0.3	15K
		(WQ)WLCM1005	0.3nH ~ 270nH	1.0	0.5	0.5	10K
		(WQ)WLCM1608	1 nH ~ 470nH	1.6	0.8	0.8	4K
	SMD Air Wound Coil (AEC-Q200)	WLA29B	3.7nH~ 17.5nH	4.95 - 5.33	4.7 - 5.84	5.46 - 5.71	1K
		(WQ) WLAC291A	2.5nH ~ 18.5nH	3.68	3.05	3.18	0.5K
		(WQ) WLAC291B	17.5nH ~ 43nH	6.86	3.05	3.18	0.5K
		(WQ) WLAC292A	1.65nH ~ 5.4nH	2.21	1.42	1.37	2K
		(WQ) WLAC292B	5.6nH ~ 12.55nH	4.04	1.42	1.37	2K
		(WQ) WLAC293A	22nH ~ 120nH	4.83	3.81	4.2	1K
		(WQ) WLAC294A	90nH ~ 538nH	10.55	6.35	5.9	1K
	SMD Square Air Wound Coil (AEC-Q200)	(WQ) WLQC0806	5.5nH ~ 19.4nH	2.591	1.829	1.397	2K
		(WQ) WLQC0807	6.9nH ~ 22nH	2.591	1.829	1.524	2K
		(WQ) WLQC0908	8.1nH ~ 27.3nH	2.972	2.134	1.829	2K
		WLQC1111	27nH ~ 47nH	3.3	2.67	2.79	2.5K
		WLQC1515	47nH ~ 82nH	5.84	3.56	3.73	2
		WLQC2222	90nH ~ 300nH	11.94	5.72	5.69	0.75K
		WLQC2929	330nH ~ 500nH	14	7.49	7.24	0.6K

Application	Type	Series	Range	Size (mm)			Quantity per reel
				L	W	H	
Signal and Noise	Ferrite Chip Inductor	WLF11608	0.047uH ~ 10uH	1.6	0.8	0.8	4K
		WLF12012	0.047uH ~ 10uH	2	1.25	0.85 / 1.25	4K / 2K
	Chip Bead	WLBD0603	10Ω ~ 1000Ω	0.6	0.3	0.3	15K
		(WQ)WLBD1005	10Ω~ 1000Ω	1	0.5	0.5	10K
		(WQ)WLBD1608	10Ω~ 2500Ω	1.6	0.8	0.8	4K
		(WQ)WLBD2012	30Ω~ 2000Ω	2	1.2	0.85	4K
		(WQ)WLBD3216	31Ω~ 2000Ω	3.2	1.6	1.1	3K
		WLBD3225	60Ω~ 90Ω	3.2	2.5	1.3	2K
		WLBD4516	80Ω~ 150Ω	4.5	1.6	1.6	2K
		WLBD4532	70Ω~ 120Ω	4.5	3.2	1.5	1K
		WLBD0603HC	10Ω ~ 330Ω	0.6	0.3	0.3	15K
	Chip Bead High Current Type	(WQ)WLBD1005HC	10Ω~ 120Ω	1	0.5	0.5	10K
		(WQ)WLBD1608HC	30Ω~ 1000Ω	1.6	0.8	0.8	4K
		(WQ)WLBD2012HC	31Ω~ 600Ω	2	1.25	0.85	4K
		(WQ)WLBD3216HC	30Ω~ 1200Ω	3.2	1.6	1.1	3K
		(WQ)WLBD3225HC	60Ω~ 1000Ω	3.2	2.5	1.3	2K
		(WQ)WLBD4516HC	60Ω~ 850Ω	4.5	1.6	1.6	2K
		WLBD4532HC	80Ω~ 1300Ω	4.5	3.2	1.5	1K
		WLFW1608	0.047uH ~ 10uH	1.8	1.1	1.2	4K
	Wire Wound Ferrite Chip Inductor	WLFW2012	0.078uH ~ 27uH	2.29	1.91	1.6	3K
		WLFW2520	0.047uH ~ 22uH	2.72	2.59	1.83	2K
		(WQ) WTCF2012	67Ω~750Ω	2	1.2	1.2	2K
	Common Mode Choke (AEC-Q200)	(WQ) WTCF2012FH	67Ω~ 120Ω	2	1.2	1.2	2K
		WTBL2012	50 / 50Ω ; 75 / 75Ω	2	1.2	1.2	2K

Quick Product Information

Application	Type	Series	Range	Size (mm)			Quantity per reel
				L	W	H	
Power Inductor	Multi-Layer Power Inductor	(WQ)WLFM160808	0.24uH ~ 2.2uH	1.6	0.80	0.80	4K
		(WQ)WLFM201205	0.47uH ~ 2.2uH	2.0	1.25	0.50	4K
		(WQ)WLFM201209	0.47uH ~ 4.7uH	2.0	1.25	0.90	3K
		(WQ)WLFM201609	0.47uH ~ 4.7uH	2.0	1.60	0.90	3K
		WLFM2520	0.47uH ~ 4.7uH	2.5	2	1	3K
	SMD Shielded Wire Wound Power Inductor	WLPN202012	1uH ~ 4.7uH	2.0	2	1.2	2.5K
		WLPN242410	0.68uH ~ 22uH	2.4	2.4	1	2.5K
		WLPN242412	0.47uH ~ 10uH	2.4	2.4	1.2	2.5K
		WLPN303010	1.2uH ~ 22uH	3	3	1	2K
		WLPN303015	1uH ~ 100uH	3	3	1.5	2K
		WLPN404010	1uH ~ 22uH	4	4	1	5K
		WLPN404018	1.0uH ~ 220uH	4	4	1.8	3.5K
		WLPN505010	1uH ~ 22uH	4.9	4.9	1	1K
		WLPN505020	1uH ~ 22uH	4.9	4.9	2	0.8K
		WLPN505040	1.0uH ~ 100uH	4.9	4.9	4.1	1.5K
		WLPN606010	1.5uH ~ 22uH	6	6	1	1K
		WLPN606028	0.9uH ~ 100uH	6	6	2.8	2K
		WLPN606045	1uH ~ 150uH	6	5.9	4.5	1.5K
		WLPN808042	0.9uH ~ 100uH	8	8	4.2	1K
	SMD Assembly Shielded Wire Wound Power Inductor	WLSS214P	1.5uH ~ 12uH	3.2	3.2	1.55	1K
		WLSS316P	1.5uH ~ 33uH	3.8	3.8	1.8	1K
		WLSS428P	1.2uH ~ 180uH	4.7	4.7	3	1.5K
		WLSS528P	2.5uH ~ 100uH	5.7	5.7	3	1.5K
		WLSS628P	3uH ~ 100uH	6.7	6.7	3	1.5K
		WLSS124P	3.9uH ~ 330uH	12	12	4.8	0.75K
		WLSS125P	1.3uH ~ 1000uH	12	12	6	0.5K
		WLSS127P	1.2uH ~ 1000uH	12	12	8	0.5K
		WLSSA38G	1.5uH ~ 330uH	10.3	10.4	4	1K
		WLSSA50G	0.8uH ~ 1000uH	10.3	10.5	5.1	0.5K
	SMD Unshielded Wire Wound Power Inductor	WLSN032D	1uH ~ 470uH	3.3	3	2.1	0.5K
		WLSN043D	1uH ~ 330uH	4.3	4	3.2	2.25K
		WLSN054D	1uH ~ 270uH	5.8	5.2	4.5	1K
		WLSN073D	10uH ~ 330uH	7.8	7	3.5	1K
		WLSN075D	6.8uH ~ 4700uH	7.8	7	5	1K
		WLSN084F	1uH ~ 1500uH	12.95	9.4	5.21	0.75K
		WLSN104D	10uH ~ 1000uH	10	9	4	1.2K
		WLSN105D	10uH ~ 820uH	10	8.9	5.4	0.7K
	SMD Molded Power Choke	WLPH201610P	0.24uH ~ 2.2uH	2.0	1.6	1.0	3K
		WLPH201610S	0.47uH ~ 2.2uH	2.0	1.6	1.0	3K
		WLPH252010P	0.22uH ~ 4.7uH	2.5	2.0	1.0	3K
		WLPH252010S	0.33uH ~ 2.2uH	2.5	2.0	1.0	3K
		WLPH252012P	0.47uH ~ 4.7uH	2.5	2.0	1.2	3K
		WLPH252012S	0.47uH ~ 2.2uH	2.5	2.0	1.2	3K
		WLPH201610Y	0.47uH ~ 1uH	2.0	1.6	1.0	3K
		WLPH252012Y	0.33uH ~ 0.47uH	2.5	2.0	1.2	3K
		WLPM444220	0.1uH ~ 10uH	4.4	4.2	1.8	2K
		WLPM545230	0.2uH ~ 10uH	5.4	5.2	2.8	2K
		WLPM706630	0.15uH ~ 22uH	7	6.6	2.8	1K
		WLPM0A0A040	0.22uH ~ 68uH	10.85 / 11.15	10	3.8	0.5K
		WLPM131350	0.1uH ~ 10uH	13.5	12.8	5.0	0.5K
		WLPM131365	0.1uH ~ 68uH	13.5	12.8	6.5	0.4K
		WLPM171770	0.82uH ~ 100uH	18	17.15	7	0.5K

RF Device

Chip Antenna

Part Number	Frequency Range (GHz)	Azimuth Beamwidth (MHz)	Gain (dBi)	VSWR (max.)	Impedance (Ω)	Polarization	Size (mm)
RFANT3216120A5T	2.4~2.5	Omni-directional	2	2.0	50	Linear	3.20x1.60x1.20
RFANT5220110A0T	2.4~2.5	Omni-directional	2	2.0	50	Linear	5.20x2.00x1.10
RFECA3216060A1T	2.4~2.5	Omni-directional	2	2.1	50	Linear	3.20x1.60x0.60
RFANT8010080A3T	2.4~2.5	Omni-directional	2	2.0	50	Linear	8.00x1.00x0.80
RGFRA1903041A1T	2.4~2.5	Omni-directional	2	2.0	50	Linear	19.0x3.00x3.80
RFANT6050110L0T	2.4~2.5 4.9~5.9	Omni-directional	4	2.0	50	Linear	5.90x5.10x1.10
RGFRA1204011DET	0.855~0.885	Omni-directional	1	2.0	50	Linear	12 x 4 x 1.6
RGFRA1204011DFT	0.9~0.93	Omni-directional	1	2.0	50	Linear	12 x 4 x 1.6

High Frequency Multilayer Band Pass Filter

Application	Part Number	Frequency Range (GHz)	Insertion Loss (dB)	Attenuation (dB min.)	VSWR (max.)	Impedance (Ω)	Size (mm)
LTE	RFBPF16081G9DMAT79	1.88 ~ 2.025 GHz	2.0 dB max. (1.9 dB typ.) (25°C) 2.2 dB max. at (-40°C ~ +85°C)	20 dB min. (25 dB typ.) (1545 ~ 1610MHz) 25 dB min. (26 dB typ.) (2400 ~ 2500MHz) 25 dB min. (30 dB typ.) (5150 ~ 5850MHz)	2.0	50	1.6 X 0.8 X 0.70
	RFBPF16081G9DM1T79	1.88 ~ 2.025 GHz	1.6 dB max.(+25°C) 1.8 dB max. (-40°C ~ +85°C)	25 dB min. @ 700~950MHz 15 dB min. @ 950~1050MHz 25 dB min. @ 2400~2500MHz 35 dB min. @ 2700~5150MHz 40 dB min. @ 5150~5850MHz 25 dB min. @ 5850~12750MHz	2.0	50	1.6 X 0.8 X 0.70
Wi-Fi/ Bluetooth	RFBPF2008A40T	2.4~2.5	1.8max.(25°C) 2.0max.(-40~+85°C)	30(824~915MHz) 30(1545~1605MHz) 35(1710~1990MHz) 30(2170MHz) 30(4800~4967MHz) 25(5150~6000MHz) 20(7200~7450.5MHz)	2.0	50	2.00x1.25x0.80
	RFBPF1411060A2T	2.4~2.5 GHz	1.5	30(500 ~ 960M Hz) 25(1500 ~ 1650 MHz) 19(3200 ~ 3300 MHz) 40(4800 ~ 5000 MHz) 30(7200 ~ 7500 MHz)	2.0	50	1.40x1.10x0.60
	RFBPF1608060K68Q1C	4.9~5.9 GHz	1.3	38(30~2700 MHz) 16(3453~3547 MHz) 33(3667~3883 MHz) 9(6900~7093 MHz) 32(7333~7750 MHz) 40(10600~11650 MHz) 18(15540~17760 MHz)	2.0	50	1.60x0.80x0.60
	RFBPF1608060K78Q1C	5.15 ~ 5.95 GHz	0.8 dB max.(25°C) 1.0 dB max. (-40~+85°C)	40.0 dB(30 - 2700 MHz) 45.0 dB(3400- 3800 MHz) 20.0 dB(7250-7800 MHz) 20.0dB(10300-11700 MHz)	1.5 max.	50	1.60x0.80x0.60
	RFBPF1608060K88Q1C	5.15 ~ 5.95 GHz	0.7 dB max. (0.6 dB Typ.) (+25°C) 0.85 dB max. (-40~+85°C)	35.0 dB (30 ~ 2700 MHz) 30.0 dB (3400~3800 MHz) 12.0dB (7250~7800 MHz) 20.0dB(10300~11700 MHz)	1.5 max.	50	1.60x0.80x0.60
	RFBPF1608060K98Q1C	5.15 ~ 5.95 GHz	0.6 dB max. (+25°C) (+25°C) 0.8 dB max. (-40~+85°C)	40.0 dB min. (30~2700 MHz) 12.0 dB min. (7250~7800MHz) 20.0 dB min.(10300~11700 MHz) 2.0 dB min. (15450~17850 MHz)	1.5 max.	50	1.60x0.80x0.60
GPS	RFBPF1109060E0T	1550~1610 MHz	1.9max.	25(960 MHz) 8(1850 MHz) 15(1990 MHz) 20(2170 MHz) 35(2400~2500 MHz) 35(3400~3800 MHz)	2.0	50	1.10x0.90x0.60
MoCA	RFBPF3225200Y07B1U	475~675 MHz	2.5max.(25°C) 2.7max.(-40~+85°C)	60(2.5 MHz) 40(2.5~100 MHz) 35(100~200 MHz) 35(200~300 MHz) 8(300~400 MHz) 57(950 MHz) 47(950~2025 MHz) 41(2025~2500 MHz) 35(2500~3000 MHz)	2.0	75	3.20x2.50x1.80
	RBBPF3225180C67B1U	1125~1675 MHz	2.0	40(1~900 MHz) 25(900~1002 MHz) 35(2000~2500 MHz) 27(2500~5900 MHz)	2.0	50	3.20x2.50x1.80

High Frequency Multilayer Balanced Filter

Application	Part Number	Frequency Range (MHz)	Impedance(Ω)		Insertion Loss (dB)	Attenuation (dB min.)	VSWR (Max.)	Phase Difference	Amplitude Difference	Size (mm)
			Unbalance	Balance						
Wi-Fi/ Bluetooth	RFBPB2012090AM1T59	2.4~2.5	50	Conjunction to MT5931/ MT6628 Chipset	2.5 (typ.2.2)	35(824~960 MHz) 32(1990 MHz) 18(2170 MHz) 40(4800~5000MHz) 25(7200~7500MHz)	2.0	180°± 10	2	2.00x1.25x0.95
	RFBPB2012090A1T	2.4~2.5	50	Conjugate match to BC series of Bluetooth chipset	3.5	35(880~960MHz) 30(1710~1880MHz) 20(1880~1990MHz) 30(4800~5000MHz)	2.1	180°± 10	2	

High Frequency Multilayer Low Pass Filter

Application	Part Number	Frequency Range (MHz)	Insertion Loss (dB)	Attenuation (dB min.)	VSWR (max.)	Impedance (Ω)	Size (mm)
NB-IoT	RFLPF16080G9D9T	690 ~ 960	0.9	20(1350 ~ 1920 MHz) 48(2070 ~ 2880 MHz)	1.92	50	1.6 X 0.8 X 0.70
NB-IoT	RFLPF1005040F0T	1695~2180	0.6	20(3350 ~ 4360 MHz) 45(5080 ~ 6540 MHz)	1.6(typ.)	50	1.00x0.50x0.40
LTE	RFLPF10050G9DM1T76	698~960	0.6max.(25°C) 0.65max.(-40~+85°C)	13 (1554~1610MHz) 35(1805~1830MHz) 35(2110~2170MHz) 30(1710~2700MHz)	2.0	50	1.00x0.50x0.40
LTE	RFLPF1005040YM1T76	746 ~ 787	0.60 max. (0.45dB typ.) (25°C) 0.65 max. (-40 ~ +85°C)	30(35dB typ.)(1554~1610MHz) 25(31dB typ.)(2238~2361MHz)	2.0	50	1.00x0.50x0.40
LTE	RFLPF1005040GM1T79	1427 ~ 2200	0.8 max.(25 °C) 0.9 max.(-40 ~ +85 °C)	32 (3400 ~ 3800 MHz) 32 (5150 ~ 5850 MHz)	2.0	50	1.00x0.50x0.40
LTE	RFLPF10051G8D8T	1880~2025	1.4max.(25°C) 1.6max.(-40~+85°C)	10(2400~2500MHz) 22(3760~4050MHz) 22(5150~5850MHz) 22(5640~6075MHz)	2.0	50	1.00x0.50x0.40
LTE	RFLPF16080G9DM1T76	698~960	0.6 dB max. at +25 °C 0.8 dB max. at -40 ~ +85 °C	30 (1554 ~ 1610 MHz) 30 (1805 ~ 1830 MHz) 30 (2110 ~ 2170 MHz) 30 (1710 ~ 2700 MHz)	2.0	50	1.60x0.80x0.60
LTE	RFLPF16082G5WM0T29	2300~2690	0.80 (typ.0.40)	25(4600~5400MHz) 25(6900~8070MHz)	2.0	50	1.60x0.80x0.60
LTE	RFLPF2012090BM0T29	800~1000 1700~1910 2010~2025	0.5(800~1000MHz) 0.8(1700~1910MHz) 1.5(2010~2025MHz)	20(2300~3700MHz) 30(3700~4100MHz) 20(4100~6100MHz) 10(6100~8000MHz)	2.0	50	2.00x1.25x0.90
Wi-Fi/ Bluetooth	RFLPF2012100F28Q1C	DC~2170	0.75(25°C) 0.85(-40~+85°C)	10(2400~2500MHz) 23(3250~3350MHz) 20(3420~3570MHz) 18(3700~3820MHz) 18(3840~3960MHz) 18(4100~4600MHz) 20(4905~5845MHz) 18(5850~6400MHz) 5(6600~7350MHz)	2.0	50	2.00x1.25x1.00
MoCA	RFLPF3225100Q07B1U	5~1002	2.4(25°C) 2.6(-40~+85°C)	36(1125~1675MHz)	2.0	75	3.20x2.50x1.00

High Frequency Multilayer High Pass Filter

Application	Part Number	Frequency Range (MHz)	Insertion Loss (dB)	Attenuation (dB min.)	VSWR (max.)	Size (mm)
LTE	RFHPF16082G5WM1T79	2496 ~ 2690	0.9 dB max. (+25°C) 1.2 dB max. (-40°C~+85°C)	22 (1710~ 2010 MHz)	2.0	1.6X 0.8 X 0.65
Wi-Fi	RFHPF0605040K0T	4900~5840	0.60max.(25°C) 0.65max.(-40~+85°C)	14(2400~2500MHz)	1.6	0.65 X 0.5 X 0.4
MoCA	RFHPF3225170F07B1U	950~2150	2.00max.(25°C) 2.2max.(-40~+85°C)	50(475~675MHz)	2.0	3.2 X 2.5 X 1.7

Common Mode Filter

Application	Part Number	Characteristic Impedance (Differential)	Common Mode Attenuation (Min.)	DC Resistance (Ω) max.	Rated Current (mA)	Size (mm)
DISCRETE CMF for HIGH SPEED TRANSMISSION LINES、USB2.0、IEEE1394、LVDS(mini)	RFCMF1220100M3T	90 ohm	9.0(240MHz ~ 1GHz)	1.5	300	1.20x2.00x1.00
	RFCMF1220100M4T	90 ohm	9.0(130 MHz ~ 1GHz)	2.5	200	1.20x2.00x1.00
	RFCMF1632090M1T	90 ohm	9.0(140 MHz ~ 1.0 GHz)	1.5	300	1.60x3.20x0.95
	RFCMF1632100M3T	90 ohm	9.0(240 MHz ~ 1.0 GHz)	1.5	300	1.60x3.20x1.00

Diplexer

Application	Part Number	Frequency (MHz)	Impedance (Ω)	Insertion Loss (dB)	Attenuation (dB)	Return Loss (dB) Min	Isolation	Size (mm)
Wi-Fi	RFDIP201507ALM6T68	2400~2500	Conj. Match To MT7668	1.5 (+25°C) 1.7 (-40 ~ +85°C)	27 dB min. @4800~5000MHz 23 dB min. @5000~5950MHz 20 dB min. @7200~7500MHz	10	25 (4900~5950MHz)	2.00 X1.50X0.70
		2400~2500	Conj. Match To MT7668	2.2 (+25°C) 2.4 (-40 ~ +85°C)	21 dB min. @4800~5000MHz 23 dB min. @5000~5950MHz 20 dB min. @7200~7500MHz	10		
		4900~5950	50	1.0 (+25°C) 1.2 (-40 ~ +85°C)	30 dB min. @2400~2500MHz 10 dB min. @8100~8800MHz 15 dB min. @8820~9800MHz 23 dB min. @9800~11900MHz	10	25 (2400~2500MHz)	
	RFDIP160806BLM6T68	2400~2500	50	0.5(+25°C) 0.65(-40 ~ +85°C)	21 (4800~5000 MHz) 21 (5000~5950 MHz) 25 (7200~7500 MHz)	10	32(35 dB typ.) (2400~2500 MHz) 25 (27 dB typ.) (4900~6000 MHz)	1.60x0.80x0.60
		4900~5950	50	0.6 (+25 °C) 0.75(-40 ~ +85 °C)	27 (824~2170 MHz) 30 (2400~2500 MHz) 20 (9800~11900 MHz)	10		
	KFDIP2004L157B1U	2400~2500	50	0.5	10(3600MHz) 20(4800~5000MHz) 20(7200~7500MHz)	10	20(DC~2500MHz) 20(4900~5950MHz)	2.00x1.25x0.40
		4900~5950	50	1.0	20(824~915MHz) 20(1800~2500MHz) 10(3000~3900MHz) 4(7250MHz) 20(9800~11900MHz) 20(14700~17850MHz)	10		
	KFDIP2004L167B1U	2400~2500	50	0.5	10(3600MHz) 20(4800~5000MHz) 20(7200~7500MHz)	10	20(DC~2500MHz) 20(4900~5950MHz)	2.00x1.25x0.40
		4900~5950	50	1.0	20(824~915MHz) 20(1800~2500MHz) 10(3000~3900MHz) 4(7250MHz) 20(9800~11900MHz) 20(14700~17850MHz)	10		
	KFDIP2004L197B1U	2400~2500	50	0.6	15(3600MHz) 25(4800~5000MHz) 20(7200~7500MHz)	10	20(DC~2500MHz) 20(4900~5950MHz)	2.00x1.25x0.40
		4900~5950	50	1.0	20(824~915MHz) 18(1800~2500MHz) 14(3000~3900MHz) 20(9800~11900MHz) 20(14700~17850MHz)	10		
	RFDIP2010L38A7B1U	2400~2500	50	0.5 dB max. (25°C) 0.65 dB max. (-40~+85°C)	10 dB min. (3600MHz) 25 dB min. (4800~5000MHz) 25 dB min. (7200~7500MHz)	10	45 dB min. (2400~2500MHz) 25 dB min. (5150~7500MHz)	2.0 X 1.25 X 1.0
		5150 ~ 7500	50	1.0 dB max. (25°C) 1.2 dB max. (-40~+85°C)	20 dB min. (824~915MHz) 20 dB min. (1800~2300MHz) 45 dB min. (2400~2500MHz) 10 dB min. (3000~3900MHz) 25 dB min. (10300~15000MHz) 20 dB min. (15450~21000MHz) 20 dB min. (21000~22500MHz)	10		2.0 X 1.25 X 1.0
	RFDIP2005L28T	2400~2500	50	0.5 (25°C) 0.8 (-40~+85°C)	20(4800~6000 MHz) 20(7200~7500 MHz)	10	15	2.00x1.20x0.5
		4900~5950	50	0.8 (25°C) 1.1 (-40~+85°C)	25(1800~2500 MHz)	10		
LTE	RFDIP1608070GM1T76	698~960	50	0.8 (typ.0.45)	25(1710~2700MHz)	10	-	1.60x0.80x0.60
		1710~2700	50	0.7 (typ.0.50)	20(698~960MHz) 20(5150~5850MHz)			

Balun Transformers

Application	Part Number	Frequency Range (MHz)	Impedance(Ω)		Return Loss (dB)Min.	Insertion Loss (dB)	Amplitude Difference (dB)Max.	Phase Difference	Size (mm)
			Unbalance	Balance					
Wi-Fi	RFBLN1608050AM0T63	2400~2500	50	50	10	1.0	1.0	180°±10°	1.60x0.80x0.55
Wi-Fi	RFBLN1608060AC6T40	2400~2500	50	Conjugate match to TICC26XX Chipset	10	1.6(25°C) 1.8(-40~+85°C)	2.3	180°±18°	1.60x0.80x0.60
NB-IoT	RFBLN1005040Y2T	758~821	50	100	15.04	0.8 (25°C) 1.0(-40~+85°C)	2.0	180°±12°	1.00x0.50x0.40
NB-IoT	RFBLN1005040F0T	1805~2170	50	100	10	1.0	1.2	180°±15°	1.00x0.50x0.40
LTE	RFBLN06052G5WM9T16	2300~2690	50	100	10	0.55(25°C) 0.65(-40~+85°C)	2.5	180°±10°	0.65x0.50x0.40

Application	Part Number	Frequency Range (MHz)	Unbalance	Balance	Return Loss (dB)Min	Insertion Loss (dB)	Amplitude Difference (dB)Max	Attenuation (dB min.)	Phase Difference	Size(mm)
GSM	RFBLN2012090BM5T25	869~960	50	200	10	1.1	2.0	10(1738~1920MHz) 20(2400~2500MHz) 20(2607~2880MHz)	180± 10	2.00x1.25x0.95
		1805~2025	50	200	10	1.8	2.0	15(2400~2500MHz) 20(3610~3980MHz) 20(5415~5970MHz)	180± 15	

Coupler

Part Number	Frequency (MHz)	Insertion Loss (dB)	Coupling in BW	Directivity in BW dB (min.)	Isolation in BW dB (min.)	VSWR	Dimension (mm ³)
RFCPL1806B2450T	2400~2500	1.83	6.5 ± 1.0 dB	-	21.0 dB min	1.5	1.60x1.80x0.60
TFCPL0605B24508Q1C	2400~2500	0.40 (typ.0.32)	14.6 ± 1.0 dB	20.0 dB min.	-	1.3	0.60x0.50x0.35
TFCPL0605030L18A1U	2400~2500	0.5	19.0±1.5dB	15 dB min.	-	1.3	0.60x0.50x0.35
	4900~5850	0.5	12.5±1.5dB	15 dB min.	-	1.3	
RFCPL1608070P38Q1C	698~2690	0.20(698~960MHz) 0.22(1710~2170MHz) 0.25(2300~2690MHz)	23.0~27.0(698~915MHz) 21.5~26.5(1710~2025MHz) 22.5~27.5(2300~2620MHz)	20	-	1.45	1.60x1.80x0.60

Antenna

Dipole Antenna (N/SMA and Cable)

TYPE	Series	Size(mm)		Working Frequency Range	Gain	VSWR	Return Loss
		L	Ø				
Dipole Antenna (N/SMA)	8709	87	9.95	2.4~2.5 GHz	2dBi	<2	<-10dB
				2.4~2.5/5.x GHz	2.4~2.5 GHz : 2dBi 5.15~5.85 GHz : 3dBi	<2	<-10dB
	1313	137.5	13	2.4~2.5 GHz	3dBi	<2	<-10dB
				2.4~2.5/5.x GHz	2.4~2.5 GHz : 3dBi 5.15~5.85 GHz : 3dBi	<2	<-10dB
	1513	157.5	13	2.4~2.5 GHz	3dBi	<2	<-10dB
				2.4~2.5/5.x GHz	2.4~2.5 GHz : 3dBi 5.15~5.85 GHz : 3dBi	<2	<-10dB
	1713	172.5	13	2.4~2.5 GHz	3dBi	<2	<-10dB
				2.4~2.5/5.x GHz	2.4~2.5 GHz : 4dBi 5.15~5.85 GHz : 5dBi	<2	<-10dB
	3913	392	12.5	2.4~2.5 GHz	9dBi	<2	<-10dB
	1310	135.7	10	2.4~2.5 GHz	5dBi	<2	<-10dB
				5.x GHz	5dBi	<2	<-10dB
				2.4~2.5/5.x GHz	3dBi~4dBi	<2	<-10dB
				Lora	3dBi	<2.5	<-7dB
	1413	148.5	13	2.4~2.5 GHz	3dBi	<2	<-10dB
				5.x GHz	3dBi	<2	<-10dB
				2.4~2.5/5.x GHz	3dBi	<2	<-10dB
				LTE	3dBi	<3	<-6dB
	1615	169.9	13	LTE+Sub-6G+5G	0.93 dBi(@ 617 ~960 MHz) 2.71 dBi(@ 1710 ~ 2690 MHz) 3.66 dBi(@ 3300 ~4200 MHz) 4.37 dBi(@5150 ~7150 MHz)	<3.0 (@617~960 / 1710~2690MHz) <3.0 (@3300~4200 / 5150~7150MHz)	<6.0 dB (@617~960 / 1710~2690MHz) <-6.0 dB (@3300~4200 / 5150~7150MHz)
	1913	196.6	13	2.4~2.5 GHz	5dBi	<2	<-10dB
				2.4~2.5/5.x GHz	2.4~2.5 GHz : 4dBi 5.15~5.85 GHz : 5dBi	<2	<-10dB
	2213	217.1	13	2.4~2.5/5.x GHz	2.4~2.5 GHz : 5dBi 5.15~5.85 GHz : 4dBi	<2	<-10dB
				2.4~2.5 GHz	6dBi	<2	<-10dB
				2.4~2.5/5.x GHz	7dBi	<2	<-10dB
				5.x GHz	7dBi	<2	<-10dB
	2220	220	20	LTE	5dBi	<3	<-6dB
				2.4 GHz	5dBi	<2	<-10dB
				5.x GHz	5dBi	<2	<-10dB
				2.4~2.5 GHz	7dBi	<2	<-10dB
	2520	25	20	2.4 GHz	5~7dBi	<2	<-10dB
				5.x GHz	7dBi	<2	<-10dB
	4358	43.1	58.45	2.4~2.5 GHz (High Gain)	7dBi	<2	<-10dB
				2.4~2.5 GHz	3.5dBi(@2.4~2.5 GHz) 2.5dBi(@4.9~7.2 GHz)	<2	<-10dB
Dipole Antenna (Cable)	8709	87	9.35	2.4~2.5 GHz	2dBi	<2	<-10dB
				2.4~2.5/5.x GHz	2.4~2.5 GHz : 2dBi 5.15~5.85 GHz : 3dBi	<2	<-10dB
	1313	133	9.35	2.4~2.5 GHz	3dBi	<2	<-10dB
				2.4~2.5/5.x GHz	2.4~2.5 GHz : 3dBi 5.15~5.85 GHz : 3dBi	<2	<-10dB
	1513	152	9.35	2.4~2.5 GHz	3dBi	<2	<-10dB
				2.4~2.5/5.x GHz	2.4~2.5 GHz : 3dBi 5.15~5.85 GHz : 3dBi	<2	<-10dB
	1514	158	14	2.4~2.5/5.x GHz	2.4~2.5 GHz : 5dBi 5.15~5.85 GHz : 7dBi	<2	<-10dB
				2.4~2.5 GHz	3dBi	<2	<-10dB
	1713	172	9.35	2.4~2.5 GHz	3dBi	<2	<-10dB
				2.4~2.5/5.x GHz	2.4~2.5 GHz : 4dBi 5.15~5.85 GHz : 5dBi	<2	<-10dB
	1310	135.7	10	2.4~2.5 GHz	5dBi	<2	<-10dB
				5.x GHz	5dBi	<2	<-10dB
				2.4~2.5/5.x GHz	3dBi~4dBi	<2	<-10dB
				LTE	3dBi	<3	<-6dB
	1913	192	9.35	2.4~2.5 GHz	5dBi	<2	<-10dB
				2.4~2.5/5.x GHz	2.4~2.5 GHz : 4dBi 5.15~5.85 GHz : 5dBi	<2	<-10dB

Connector

Series	Size(mm)		Working Frequency Range	VSWR
	L	W		
1612	16.8	12.3	DC ~ 6 GHz	2.0
0703	7.5	3.3	DC ~ 6 GHz	2.0
1308	13.3	8	DC ~ 6 GHz	2.0
1609	16.5	9	DC ~ 6 GHz	2.0

Cable Assembly

Series	Connector 1	Connector 2	Wire Diameter	Color	L	Working Frequency Range	VSWR
1006	Straight Reverse SMA Jack	IPEX(or Strip & Tin)	Ø1.13/Ø1.37/RG178	Option	Option	DC ~ 6 GHz	2.0
1106	Straight Reverse SMA Jack	IPEX(or Strip & Tin)	Ø1.13/Ø1.37/RG178	Option	Option	DC ~ 6 GHz	2.0
1613	R/A Reverse SMA Jack	IPEX(or Strip & Tin)	Ø1.13/Ø1.37/RG178	Option	Option	DC ~ 6 GHz	2.0
0403	IPEX	IPEX(or Strip & Tin)	Ø0.81/Ø1.13/Ø1.37/RG178	Option	Option	DC ~ 6 GHz	2.0
0202	IPEX III	IPEX(or Strip & Tin)	Ø0.81	Option	Option	DC ~ 6 GHz	2.0
xxxx	Strip & Tin	Strip & Tin	Ø0.81/Ø1.13/Ø1.37/RG178	Option	Option	DC ~ 6 GHz	2.0
1015	N Jack	MMCX(or Strip & Tin)	RG316	Option	Option	DC ~ 6 GHz	2.0
1008	Straight Reverse SMA Plug	IPEX(or Strip & Tin)	RG405	Option	Option	DC ~ 6 GHz	2.0

PCB Antenna, FPA Antenna and Metal Antenna

TYPE	Series	PCB Size (mm)		Cable Length (mm)	Working Frequency Range	Gain	VSWR	Return Loss
		L	w	L				
PCB Antenna	1118	118	18	Option	LTE+Sub-6G+5G	3.32 dBi (@ 698~960 MHz) 6.04 dBi (@1710~2690MHz) 5.36 dBi (@3300~3800MHz) 4.39 dBi (@5150~5850MHz)	<2.0 (@698~960MHz) <3.0 (@1710~2690/ 3300~3800/ 5150~5850MHz)	<-10.0 dB (@698~960/1710~2690MHz) <-6.0 dB (@3300~3800/5150~5850MHz)
	2022	20	22	Option	LTE+Sub-6G+5G	5.54 dBi	<2	<-10dB
	2313	23	13	Option	5 GHz	3dBi	<2	<-10dB
	4305	43	5	Option	2.4~2.5 GHz	2dBi	<2	<-10dB
	2010	20.1	10	Option	5 GHz	3dBi	<2	<-10dB
	5010	50	10	Option	2.4~2.5 GHz	3dBi	<2	<-10dB
	4308	43	8.3	Option	2.4~2.5/5.x GHz	2.4~2.5 GHz : 2dBi 5.x GHz : 3dBi	<2	<-10dB
	4606	46.5	6	Option	2.4~2.5 GHz	2dBi	<2	<-10dB
	3513	35	13	Option	2.4~2.5 GHz	4dBi	<2	<-10dB
FPA Antenna	3515	35	15	Option	2.4~2.5/5.x GHz	2.4~2.5 GHz : 2dBi 5.x GHz : 3dBi	<2	<-10dB
	3025	30.3	25.3	Option	2.4~2.5 GHz	3dBi	<2	<-10dB
	3225	25	32.6	Option	2.4~2.5 GHz	2dBi	<2	<-10dB
	3226	32.35	26	Option	2.4~2.5 / 5.x GHz	3dBi	<2	<-10dB
	4305	43	5.5	Option	2.4~2.5 GHz	3dBi	<2	<-10dB
	3010	30	10	Option	2.4~2.5 GHz	2dBi	<2	<-10dB
Metal Antenna	2006	20	6	Option	5.x GHz	2dBi	<2	<-10dB
	3109	31	9	Option	2.4~2.5/5.x GHz	2.4~2.5 GHz : 2 dBi 5.x GHz : 2 dBi	<2	<-10dB
	2107	21.5	7.1	None	2.4~2.5 GHz	3 dBi	<2	<-10dB
	2807	28.6	7.9	Option	2.4~2.5 GHz	3 dBi	<2	<-10dB
	3407	34	7.5	Option	2.4~2.5 GHz	3 dBi	<2	<-10dB
	3706	37.4	6.5	Option	2.4~2.5/5.x GHz	2.4~2.5 GHz : 5 dBi 5.x GHz : 5 dBi	<2	<-10dB
	2712	27.75	12.8	None	2.4~2.5 GHz	3.38 dBi	<2	<-10dB
	2811	27.05	11.3	None	2.4~2.5/5.x GHz	2.4~2.5 GHz : 2.66dBi 5.x GHz : 3.68dBi	<2	<-10dB
	2911	29.6	11.3	None	2.4~2.5/5.x GHz	2.4~2.5 GHz : 2.14dBi 5.x GHz : 2.68dBi	<2	<-10dB

NFC Antenna (NFC/WPC/WNC)

TYPE	Series	Size (mm)		Ls	Rs	Q
		L	w			
NFC	5030	50	30	1.62±0.1μH	0.66±0.15Ω	15.42±2.5(1MHz)
	5040	50	40	1.89±0.1μH	0.76±0.15Ω	15.62±2.5(1MHz)
	6040	60	40	2.37±0.1μH	0.85±0.15Ω	17.5±2.5(1MHz)
WPC	4832	48	32	1.35±0.1μH	0.3±0.15Ω	28.3±2.5(1MHz)
WNC	6060	60	60	NFC 2.11±0.1μH	NFC 0.572±0.15Ω	NFC 37.2±2.5(1MHz)
				WPC 18.69±0.1μH	WPC 0.837±0.15Ω	WPC 14.03±2.5(1MHz)

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