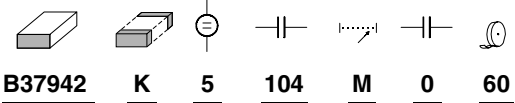


Z5U (Y5U)

Ordering code system



**Packaging**

60  $\triangle$  cardboard tape, 180-mm reel  
 62  $\triangle$  blister tape, 180-mm reel  
 70  $\triangle$  cardboard tape, 330-mm reel  
 72  $\triangle$  blister tape, 330-mm reel  
 01  $\triangle$  bulk case

**Internal coding**

**Capacitance tolerance**

**M  $\triangle$   $\pm$  20 % (standard)**

**Capacitance, coded** 104  $\triangle$   $10 \cdot 10^4$  pF = 100 nF  
 (example) 105  $\triangle$   $10 \cdot 10^5$  pF = 1  $\mu$ F  
 224  $\triangle$   $22 \cdot 10^4$  pF = 220 nF

<b>Rated voltage</b>	Rated voltage [VDC]	25	50
	Code	0	5

**Termination** Standard: K  $\triangle$  nickel barrier for case sizes 0603, 0805, 1206, 1210  
 J  $\triangle$  silver palladium for case sizes 1812, 2220

Type and size	
Chip size (inch / mm)	Temperature characteristic Z5U (Y5U)
0603 / 1608	B37932
0805 / 2012	B37942
1206 / 3216	B37873
1210 / 3225	B37951
1812 / 4532	B37954
2220 / 5750	B37957

DataSheet4U.com

**Z5U (Y5U)**
**SMD**
**Features**

- Extremely high volumetric efficiency
- Non-linear capacitance change
- Y5U characteristic is also fulfilled


**Applications**

- Blocking
- Coupling
- Decoupling
- Interference suppression


**Termination**

- For soldering: Nickel-barrier termination (Ni) for case sizes 0603 to 1210  
Silver-palladium termination (AgPd) for case sizes 1812 and 2220

**Delivery mode**

- Cardboard and blister tape (blister tape for chip thickness  $\geq 1,2 \pm 0,1$  mm and case sizes  $\geq 1210$ ), 180-mm and 330-mm reel available
- Bulk case for case sizes 0603 and 0805 ( $\geq 68$  nF)

**Electrical data**

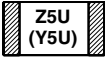
Temperature characteristic		Z5U (Y5U) <sup>1)</sup>	
Climatic category (IEC 60068-1)		30/85/56	
Standard		EIA	
Dielectric		Class 2	
Rated voltage <sup>2)</sup>	$V_R$	25, 50	VDC
Test voltage	$V_{test}$	$2,5 \cdot V_R/5$ s	VDC
Capacitance range	$C_R$	10 nF ... 4,7 $\mu$ F	
Max. relative capacitance change	$\Delta C/C$	+22/-56	%
Dissipation factor (limit value)	$\tan \delta$	$< 50 \cdot 10^{-3}$	
Insulation resistance <sup>3)</sup> at +25 °C	$R_{ins}$	$> 10^4$	M $\Omega$
Time constant <sup>3)</sup> at +25 °C	$\tau$	$> 500$	s
Operating temperature range	$T_{op}$	-30 ... +85	°C
Ageing <sup>4)</sup>		yes	

1) Y5U specification is also fulfilled.

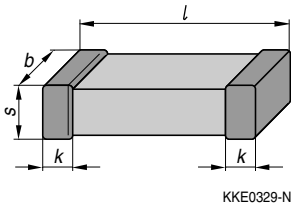
2) Note: No operation on AC line.

3) For  $C_R > 10$  nF the time constant  $\tau = C \cdot R_{ins}$  is given.

4) Refer to chapter "General Technical Information", page 197.


**Capacitance tolerances**

Code letter	M (standard)
Tolerance	$\pm 20\%$

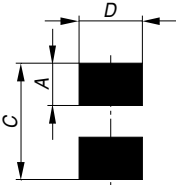
**Dimensional drawing**

**Dimensions (mm)**

Case size (inch) (mm)	0603 1608	0805 2012	1206 3216	1210 3225
<i>l</i>	$1,6 \pm 0,15$	$2,0 \pm 0,20$	$3,2 \pm 0,20$	$3,2 \pm 0,30$
<i>b</i>	$0,8 \pm 0,10$	$1,25 \pm 0,15$	$1,6 \pm 0,15$	$2,5 \pm 0,30$
<i>s</i>	$0,8 \pm 0,10$	1,30 max.	1,30 max.	1,30 max.
<i>k</i>	0,1 – 0,4	0,13 – 0,75	0,25 – 0,75	0,25 – 0,75

Case size (inch) (mm)	1812 4532	2220 5750
<i>l</i>	$4,5 \pm 0,30$	$5,7 \pm 0,40$
<i>b</i>	$3,2 \pm 0,30$	$5,0 \pm 0,40$
<i>s</i>	1,30 max.	1,30 max.
<i>k</i>	0,25 – 1,0	0,25 – 1,0

Tolerances to CECC 32101-801

**Recommended solder pad**

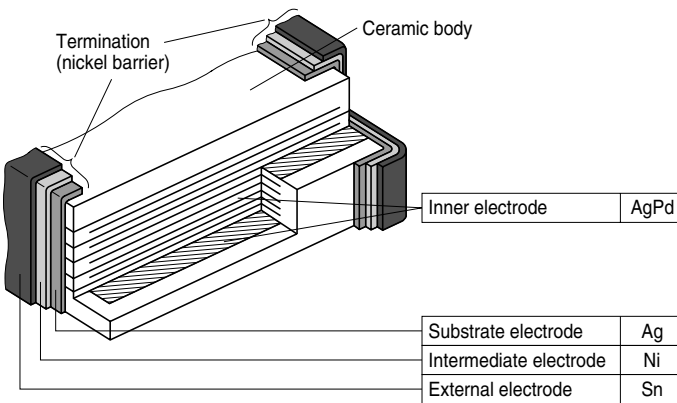


KKE0308-1

**Maximum dimensions (mm)**

Case size (inch/mm)	Type	A	C	D
0603/1608	single chip	1,0	3,0	1,0
0805/2012	single chip	1,2	3,4	1,3
1206/3216	single chip	1,2	4,5	1,8
1210/3225	single chip	1,2	4,5	2,8
1812/4532	single chip	1,5	6,0	3,6
2220/5750	single chip	1,5	7,2	5,5

**Termination**

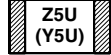


KKE0484-W

**Product range chip capacitors**

		Z5U (Y5U)											
Size <sup>1)</sup> inch mm		0603 1608		0805 2012		1206 3216		1210 3225		1812 4532		2220 5750	
		Type	B37932		B37942		B37873		B37951		B37954		B37957
$V_R$ (VDC)		25		50		25		50		25		50	
$C_R$		25	50	25	50	25	50		50		50		50
10	nF												
15	nF												
22	nF												
33	nF												
47	nF												
68	nF												
100	nF												
150	nF												
220	nF												
330	nF												
470	nF												
680	nF												
1,0	μF												
1,5	μF												
2,2	μF												
3,3	μF												
4,7	μF												

1)  $l \times b$  (inch) /  $l \times b$  (mm)

**Multilayer Ceramic Capacitors**
**Z5U (Y5U); 0603 to 1206**

**Ordering codes and packing for Z5U (Y5U), 25 VDC, nickel-barrier terminations**

$C_R$	Ordering code	Chip thickness mm	Cardboard tape, Ø 180-mm reel	Cardboard tape, Ø 330-mm reel	Bulk case
			** $\triangle$ 60	** $\triangle$ 70	** $\triangle$ 01
			pcs/reel	pcs/reel	pcs

**Case size 0603, 25 VDC**

100 nF	B37932K0104M0**	0,8 ± 0,1	4000	16000	15000
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**Case size 0805, 25 VDC**

150 nF	B37942K0154M0**	0,8 ± 0,1	4000	16000	–
220 nF	B37942K0224M0**	0,8 ± 0,1	4000	16000	–

**Case size 1206, 25 VDC**

1,0 $\mu$ F	B37873K0105M0**	1,2 ± 0,1	3000 <sup>1)</sup>	12000 <sup>2)</sup>	–
-------------	-----------------	-----------	--------------------	---------------------	---

1) Blister tape, 180-mm reel, ordering code \*\*  $\triangle$  62

2) Blister tape, 330-mm reel, ordering code \*\*  $\triangle$  72


**Ordering codes and packing for Z5U (Y5U), 50 VDC, nickel-barrier terminations**

$C_R$	Ordering code	Chip thickness mm	Cardboard tape, Ø 180-mm reel	Cardboard tape, Ø 330-mm reel	Bulk case
			** $\triangle$ 60	** $\triangle$ 70	** $\triangle$ 01
			pcs/reel	pcs/reel	pcs

**Case size 0603, 50 VDC**

10 nF	B37932K5103M0**	0,8 ± 0,1	4000	16000	15000
22 nF	B37932K5223M0**	0,8 ± 0,1	4000	16000	15000
47 nF	B37932K5473M0**	0,8 ± 0,1	4000	16000	15000

**Case size 0805, 50 VDC**

10 nF	B37942K5103M0**	0,6 ± 0,1	5000	20000	10000
22 nF	B37942K5223M0**	0,6 ± 0,1	5000	20000	10000
47 nF	B37942K5473M0**	0,6 ± 0,1	5000	20000	10000
100 nF	B37942K5104M0**	0,8 ± 0,1	4000	16000	–

**Case size 1206, 50 VDC**

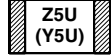
100 nF	B37873K5104M0**	0,8 ± 0,1	4000	16000	–
220 nF	B37873K5224M0**	0,8 ± 0,1	4000	16000	–
470 nF	B37873K5474M0**	1,2 ± 0,1	3000 <sup>1)</sup>	12000 <sup>2)</sup>	–

**Case size 1210, 50 VDC**

470 nF	B37951K5474M0**	0,8 ± 0,1	4000 <sup>1)</sup>	16000 <sup>2)</sup>	–
1,0 µF	B37951K5105M0**	1,2 ± 0,1	3000 <sup>1)</sup>	12000 <sup>2)</sup>	–

1) Blister tape, 180-mm reel, ordering code \*\*  $\triangle$  62

2) Blister tape, 330-mm reel, ordering code \*\*  $\triangle$  72

**Multilayer Ceramic Capacitors**
**Z5U (Y5U); 1812 and 2220**

**Ordering codes and packing for Z5U (Y5U), 50 VDC, silver-palladium terminations**

$C_R$	Ordering code	Chip thickness	Blister tape, Ø 180-mm reel	Blister tape, Ø 330-mm reel
		mm	** $\triangle$ 62	** $\triangle$ 72
			pcs/reel	pcs/reel

**Case size 1812, 50 VDC**

680 nF	B37954J5684M0**	1,2 ± 0,1	1500	5000
1,0 µF	B37954J5105M0**	1,2 ± 0,1	1500	5000
1,5 µF	B37954J5155M0**	1,2 ± 0,1	1500	5000

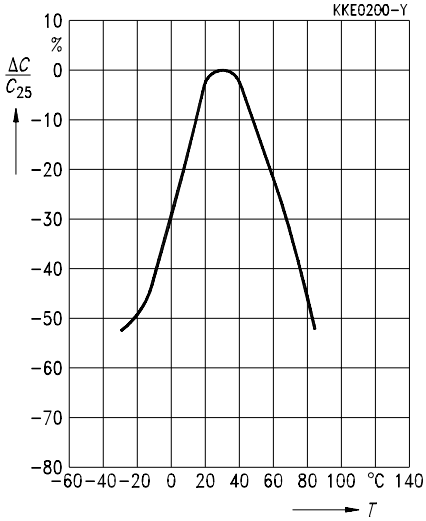
**Case size 2220, 50 VDC**

1,0 µF	B37957J5105M0**	1,2 ± 0,1	1500	5000
2,2 µF	B37957J5225M0**	1,2 ± 0,1	1500	5000
4,7 µF	B37957J5475M0**	1,2 ± 0,1	1500	5000

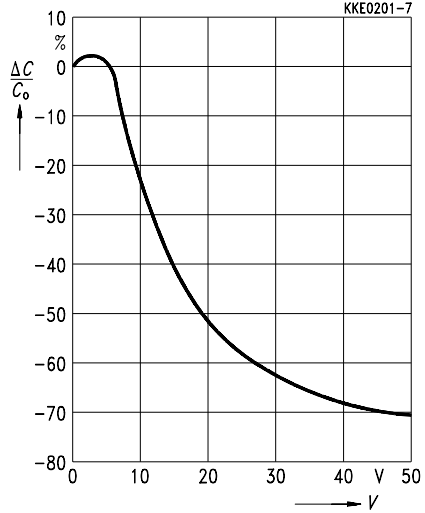


**Typical characteristics**

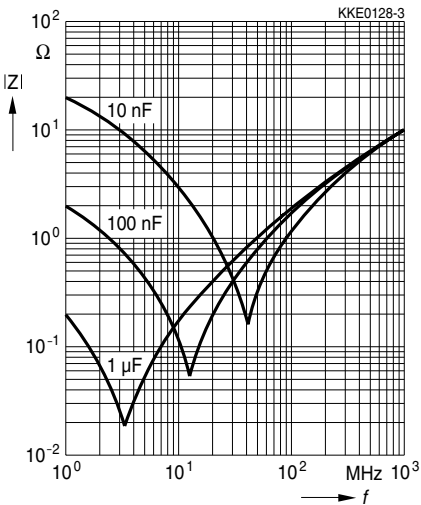
Capacitance change  $\Delta C/C_{25}$  versus temperature  $T$



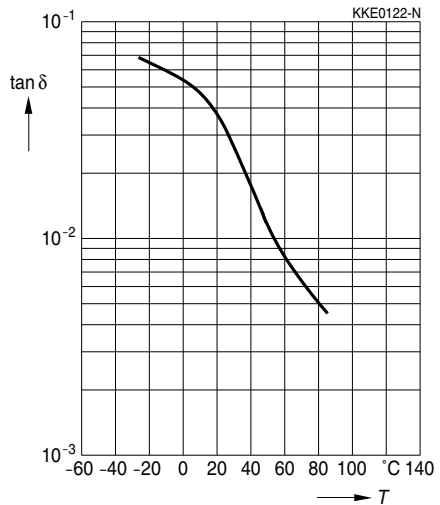
Capacitance change  $\Delta C/C_0$  versus superimposed DC voltage  $V$



Impedance  $|Z|$  versus frequency  $f$

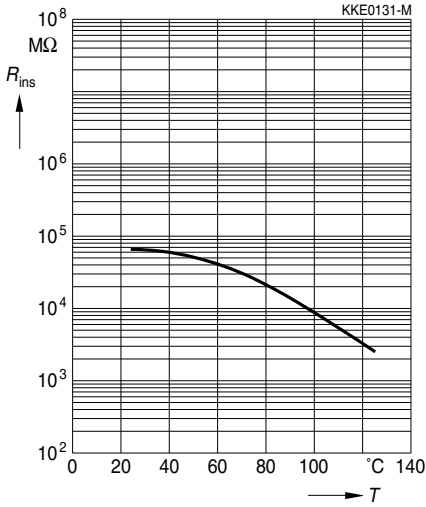


Dissipation factor  $\tan \delta$  versus temperature  $T$

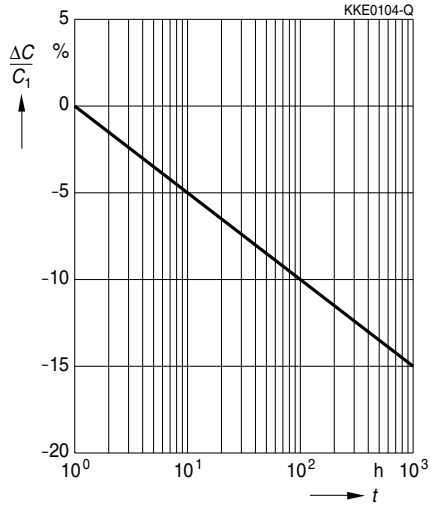


**Typical characteristics**

Insulation resistance  $R_{ins}$  versus temperature  $T$



Capacitance change  $\Delta C/C_1$  versus time  $t$



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