



DCS / DCT / DCU / DCA Thick Film

- **State of the Art Thick Film Technology**
- **Improved Termination Design**
- **Standard TC: 100 and 200 ppm/K**
- **Tight Tolerance available: 1 %**
- **Sizes**

CECC:	0402	0603	0805	1206
EIA:	1005	1608	2012	3216

DCS, DCT, DCU and DCA Thick Film Flat Chip Resistors are made for all general purpose applications. They are typically used in the production of office automation equipment and consumer electronics.

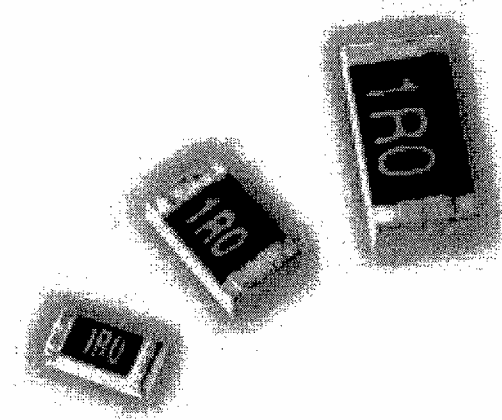
The production of the **DCS, DCT, DCU and DCA Thick Film Flat Chip Resistors** is performed in a mass volume production site. A thick film is screen printed on a high grade alumina ceramic substrate to form the resistive layer. Pre contacts are printed on both sides of the substrate. The resistors are laser trimmed to the target value. The resistor elements are covered by glass and a protective coating combined for superior electrical, mechanical and climatic protection. The prepared terminations receive an electroplating of PbSn solder on nickel plating. A three or four digit code designates the nominal resistance value.

The result of the determined production is verified by a final test performed on 100 % of the individual chip resistors. Only accepted products are laid directly into the paper tape according to **IEC 60 286-3**.

The resistors are suitable for processing on automatic SMD assembly systems. They are suitable for automatic soldering using wave, reflow or vapour phase. The encapsulation is resistant to all cleaning solvents commonly used in the electronics industry, including alcohols, esters and aqueous solutions.

The resistors are tested according to **IEC 60 115** and **IEC 60 068**. They meet most of the requirements of **CECC 40 401-802** and **EN 140 400**.

This product family of thick film flat chip resistors is complemented by **Zero Ohm Jumpers**.





Temperature Coefficient and Resistance Range

	Tolerance	IEC Series	DCS 0402	DCT 0603	DCU 0805	DCA 1206
TC 200	5 %	E24	10 Ω - 1 MΩ	1 Ω - 6,8 MΩ	1 Ω - 10 MΩ	1 Ω - 10 MΩ
	1 %	E24 and E96	-	-	1 Ω - 9,76 Ω 1,02 MΩ - 10 MΩ	1 Ω - 9,76 Ω 1,02 MΩ - 10 MΩ
TC 100	1 %	E24 and E96	-	-	10 Ω - 1 MΩ	10 Ω - 1 MΩ
Jumper			≤ 50 mΩ $I_{\max} = 0,8 \text{ A}$	≤ 50 mΩ $I_{\max} = 0,8 \text{ A}$	≤ 50 mΩ $I_{\max} = 1,1 \text{ A}$	≤ 50 mΩ $I_{\max} = 1,6 \text{ A}$



Electrical Data

Style		DCS 0402	DCT 0603	DCU 0805	DCA 1206
Climatic Category		55 / 125 / 56	55 / 125 / 56	55 / 125 / 56	55 / 125 / 56
Operation Mode (see A4)		Standard	Standard	Standard	Standard
Film Temperature	°C	125	125	125	125
Specified Lifetime	h	8 000	8 000	8 000	8 000

The specification for standard operation mode ensures a maximum temperature of 110 °C at the solder joint on test boards according to CECC 00 802

Thermal Resistance R_{th}	K/W	880	880	440	220
Rated Dissipation P_{70}	W	0,063	0,063	0,125	0,25

Voltage Pulse Load Capability					
Pulse Voltage, U_{max}	V	up to 100	up to 150	up to 300	up to 400
Single Pulse IEC 1,2 / 50	V	–	–	–	–
Energy Pulse Load Capability					
Single Pulse, P_{max}	W	up to 3	up to 4	up to 6	up to 10
Continuous Pulses, P_{max}	W	up to 0,7	up to 1	up to 1,3	up to 2
Current Noise, A_1	µV/V	down to 0,5	down to 0,5	down to 0,5	down to 0,5
Attenuation 3rd Harmonic, A_3	dB	–	up to 70	up to 80	up to 100

Max. Resistance Change at P_{70} for Resistance Range		10 Ω - 1 MΩ	10 Ω - 1 MΩ	10 Ω - 1 MΩ	10 Ω - 1 MΩ
$\Delta R/R$ after ...					
... 1 000 h	%	≤ 3	≤ 1,5	≤ 1,5	≤ 1,5
... 8 000 h	%	≤ 6	≤ 3	≤ 3	≤ 3

Operating Voltage, U_{max} AC / DC	V	50	50	150	200
Permissible Voltage against Ambient ...					
... 1 minute	V	75	150	150	200
... continuous	V	75	75	75	75
Isolation Resistance	Ω	10 ⁹	10 ⁹	10 ⁹	10 ⁹

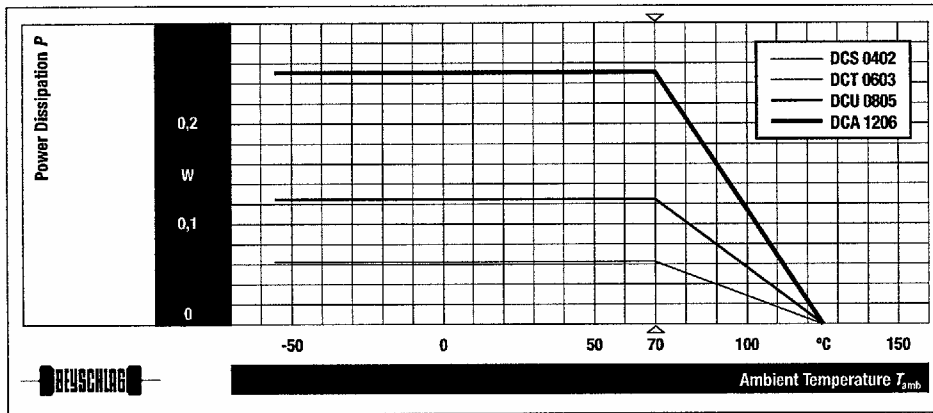
DCS 0402
DCT 0603
DCU 0805
DCA 1206

Thick Film

Flat Chip
Resistor Products



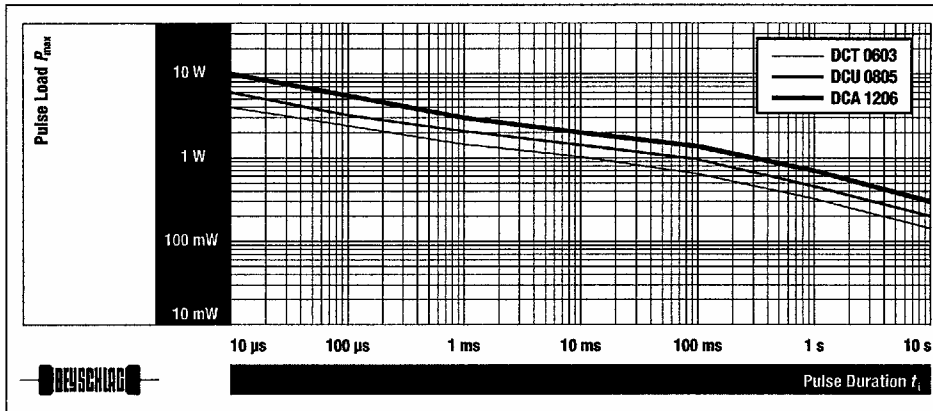
Derating • Standard Operation





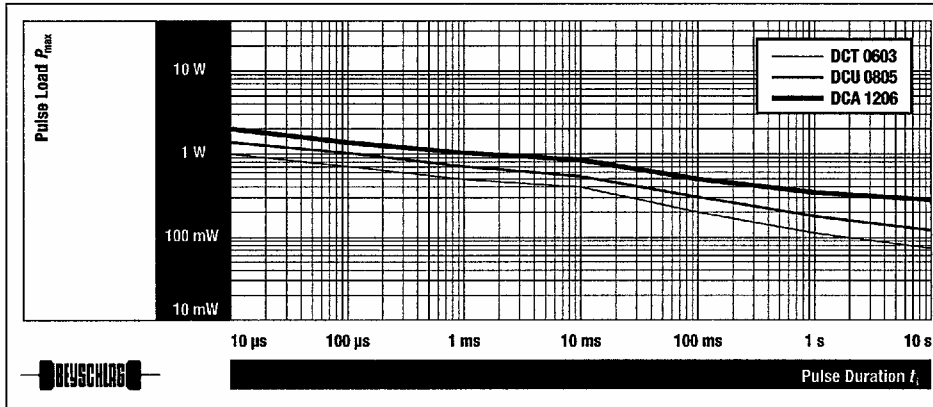
Single Pulse

Maximum Pulse Load (single pulse; see A2)



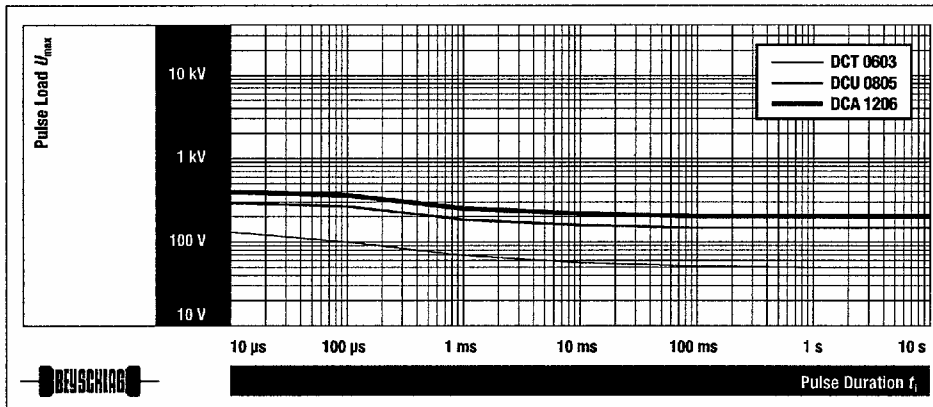
Continuous Pulses

Maximum Pulse Load (continuous pulses; see A2)



Pulse Load Voltage

Maximum Pulse Voltage (single and continuous pulses; see A2)



DCS 0402
DCT 0603
DCU 0805
DCA 1206

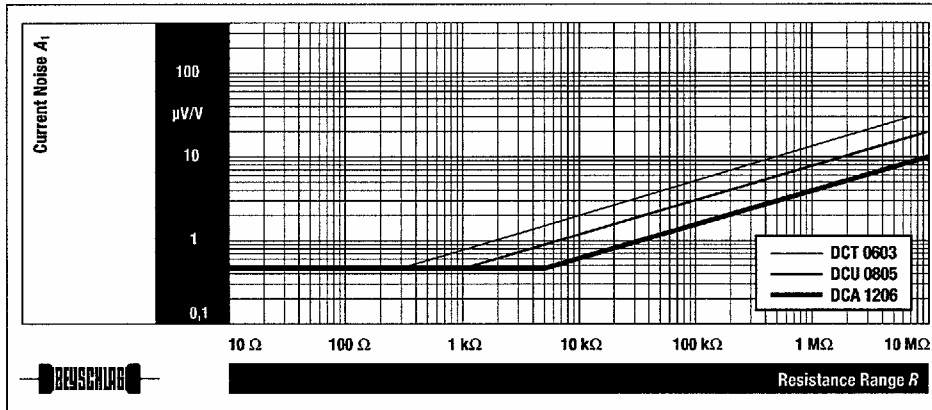
Thick Film

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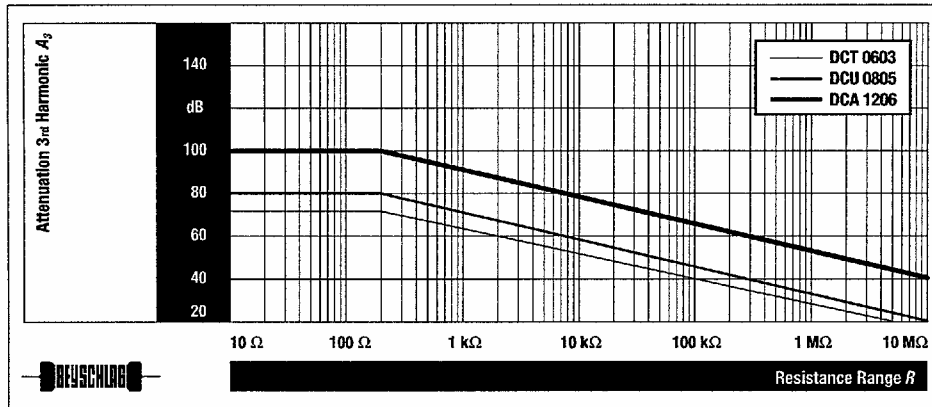
Current Noise

Current Noise A_1 , IEC 60 195



Nonlinearity

Nonlinearity A_3 , IEC 60 440





Performance Characteristics

BEYSCHLAG Flat Chip Resistor Products fulfill the requirements of the following specifications:

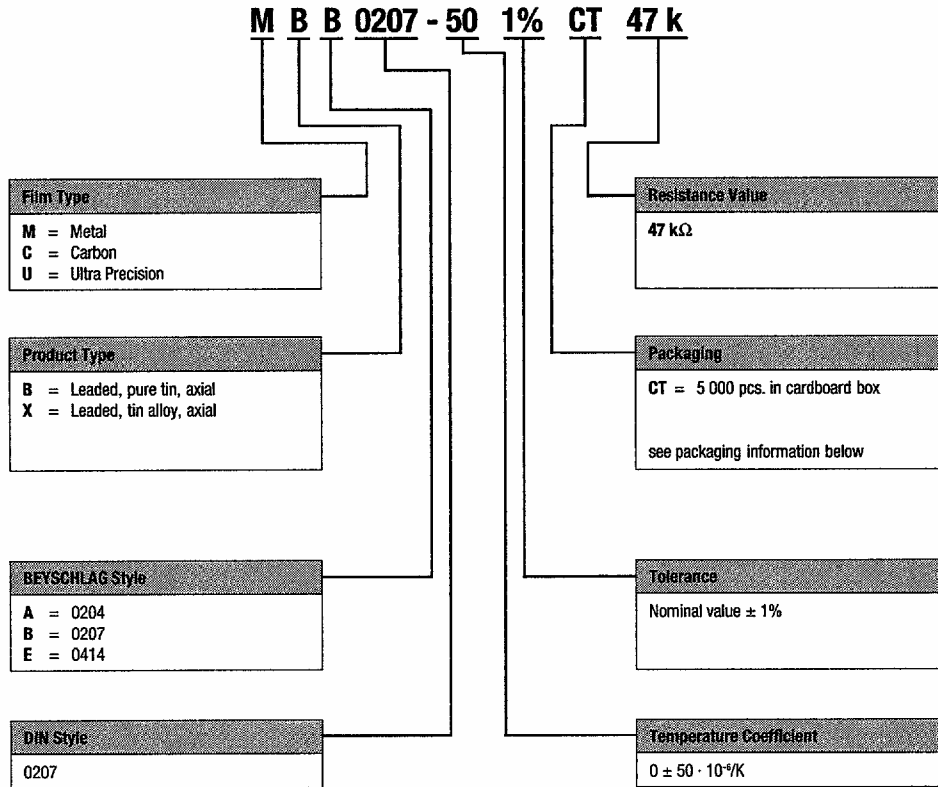
EN 140 000 Generic specifications: Fixed Resistors
EN 140 400 Sectional specifications: Fixed low power non-wirewound Resistors

Tests

	IEC 60 115-1 Clause	IEC 60 068-2 (Method)	Test Condition	Permissible Change ΔR		
				DCS 0402	DCT 0603	DCU 0805
				-	-	$\leq 1 \text{ M}\Omega$
				$\leq 1 \text{ M}\Omega$	$> 1 \text{ M}\Omega$	-
				$\leq 1 \text{ M}\Omega$	$> 1 \text{ M}\Omega$	-
				$\leq 1 \text{ M}\Omega$	$> 1 \text{ M}\Omega$	-
Short-Time Overload *)	4.13		2,5 x rated voltage / 2 x U_{max} for 2 s	$\pm (1\%R+0,05\Omega)$	$\pm (1\%R+0,05\Omega)$	$\pm (2\%R+0,1\Omega)$
Resistance to Soldering Heat	4.18.2	20 (Tb)	+ 260 °C / 10 s	$\pm (0,5\%R+0,05\Omega)$	$\pm (0,5\%R+0,05\Omega)$	$\pm (1\%R+0,1\Omega)$
Rapid Change of Temperature *)	4.19	14 (Na)	5 cycles between - 55 °C / + 125 °C	$\pm (0,5\%R+0,05\Omega)$	$\pm (0,5\%R+0,05\Omega)$	$\pm (2\%R+0,1\Omega)$
Endurance of ...	4.25.1		Rated voltage / U_{max} 1,5 h on / 0,5 h off			
... +70 °C / 1 000 h				$\pm (1,5\%R+0,1\Omega)$	$\pm (3\%R+0,1\Omega)$	$\pm (3\%R+0,1\Omega)$
Climatic Sequence *)	4.23	30 (D)	Dry heat – damp heat (1 cycle) – cold – low air pressure – damp heat (5 cycles)	$\pm (1,5\%R+0,1\Omega)$	$\pm (3\%R+0,1\Omega)$	$\pm (1\%R+0,1\Omega)$
Damp Heat, Steady State 56 Days *)	4.24	3 (Ca)	+ 40 °C / 93 % R.H.	$\pm (1,5\%R+0,1\Omega)$	$\pm (3\%R+0,1\Omega)$	$\pm (3\%R+0,1\Omega)$
Endurance at UCT / 1 000 h	4.25.3	27 (Ba)				
UCT = + 125 °C				$\pm (1,5\%R+0,1\Omega)$	$\pm (3\%R+0,1\Omega)$	$\pm (3\%R+0,1\Omega)$
				Requirements		
Terminal Adhesion (shear test)			CECC 00 802 / B.2 5 N / 10 s	No visible damage		
Voltage Proof (dielectric with- standing voltage)	4.7		$V_{ms} = 100 \text{ V} / 60 \text{ s}$	No flashover or breakdown		
Solderability	4.17.2	20 (Ta)	+ 215 °C / 3 s	Dipped area shall be covered with a smooth and bright solder coating of at least 95 %		
Resistance against Solvents *)		45 (xA)	Alcohols, ester, hydrous solution, + 23 °C, tooth brush method	No mechanical damage Marking must be legible		

*) Resistors mounted on a test board according to CECC 00 802

Order Code Example



Jumpers are ordered by the resistance value 0 Ω, e.g. **MBB 0207 CT 0R0**.
For **CBB 0207** no temperature coefficient is specified.

Packaging Information

Style			MBA 0204	MBB 0207	MBE 0414	CBB 0207
			UXA 0204	UXB 0207		
Reel Pack	RP	pcs.	5 000	5 000	-	-
Cardboard Box	none	pcs.	1 000	1 000	1 000	1 000
Cardboard Box	CT	pcs.	5 000	5 000	-	5 000