

DATA SHEET

GENERAL PURPOSE CHIP RESISTORS

RC0805 (Pb Free) 5%; 1%



YAGEO







Product specification

2

Chip Resistor Surface Mount RC SERIES 0805 (Pb Free)



Chip Resistor Surface Mount | RC | SERIES | 0805 (Pb Free)

MARKING

RC0805



E-24 series: 3 digits

First two digits for significant figure and 3rd digit for number of zeros



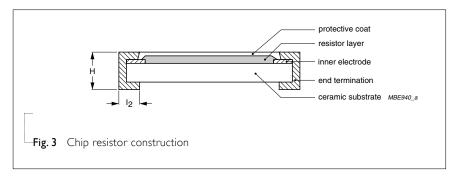
Both E-24 and E-96 series: 4 digits

First three digits for significant figure and 4th digit for number of zeros

For marking codes, please see EIA-marking code rules in data sheet "Chip resistors instruction".

CONSTRUCTION

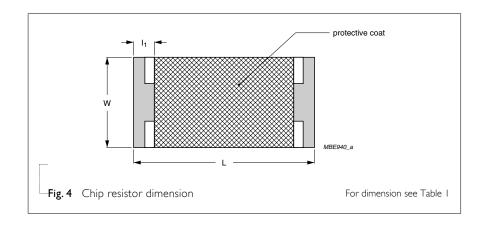
The resistors are constructed out of a high-grade ceramic body. Internal metal electrodes are added at each end and connected by a resistive paste. The composition of the paste is adjusted to give the approximate required resistance and laser cutting of this resistive layer that achieves tolerance trims the value. The resistive layer is covered with a protective coat and printed with the



resistance value. Finally, the two external terminations (pure Tin) are added. See fig. 3.

DIMENSIONS

Table I	
TYPE	RC0805
L (mm)	2.00 ±0.10
W (mm)	1.25 ±0.10
H (mm)	0.50 ±0.10
I _I (mm)	0.35 ±0.20
I ₂ (mm)	0.35 ±0.20





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ELECTRICAL CHARACTERISTICS

Table 2

CHARACTERISTICS	RC0805 1/8 W		
Operating Temperature Range	–55 °C to +155 °C		
Maximum Working Voltage	150 V		
Maximum Overload Voltage	300 V		
Dielectric Withstanding Voltage		300 V	
	5% (E24)	I Ω to 22 M Ω	
Resistance Range	1% (E96)	I Ω to I0 M Ω	
	Zero Ohm Jumper < 0.05 Ω		
Temperature Coefficient	$10~\Omega < R \le 10~M\Omega$	±100 ppm/°C	
remperature Coefficient	$R \le 10 \Omega$; $R > 10 M\Omega$	±200 ppm/°C	
Jumper Criteria	Rated Current	2.0 A	
Jumper Criteria	Maximum Current	5.0 A	

FOOTPRINT AND SOLDERING PROFILES

For recommended footprint and soldering profiles, please see the special data sheet "Chip resistors mounting".

ENVIRONMENTAL DATA

For material declaration information (IMDS-data) of the products, please see the separated info "Environmental data".

PACKING STYLE AND PACKAGING QUANTITY

Table 3 Packing style and packaging quantity

PRODUCT TYPE	PACKING STYLE	REEL DIMENSION	QUANTITY PER REEL
RC0805	Paper / PE Taping Reel (R)	7" (178 mm)	5,000 units
		10" (254 mm) / not preferred	10,000 units
		13" (330 mm)	20,000 units

NOTE

1. For Paper/PE tape and reel specification/dimensions, please see the special data sheet "Packing" document.

FUNCTIONAL DESCRIPTION

POWER RATING

RC0805 rated power at 70°C is 1/8 W

RATED VOLTAGE

The DC or AC (rms) continuous working voltage corresponding to the rated power is determined by the following formula:

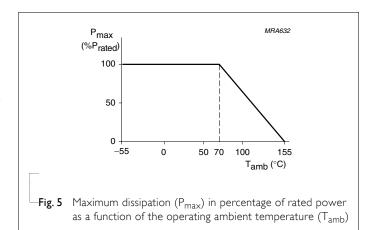
$$V=\sqrt{(P \times R)}$$

Where

V=Continuous rated DC or AC (rms) working voltage (V)

P=Rated power (W)

R=Resistance value (Ω)



PULSE LOADING CAPABILITIES

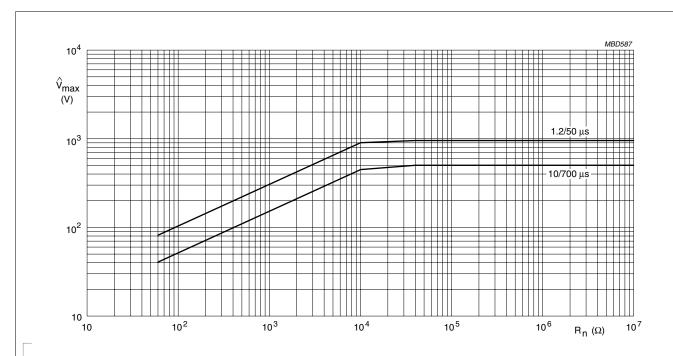


Fig. 6 Maximum permissible peak pulse voltage without failing to open circuit' in accordance with DIN IEC 60040 (CO) 533 for type: RC0805



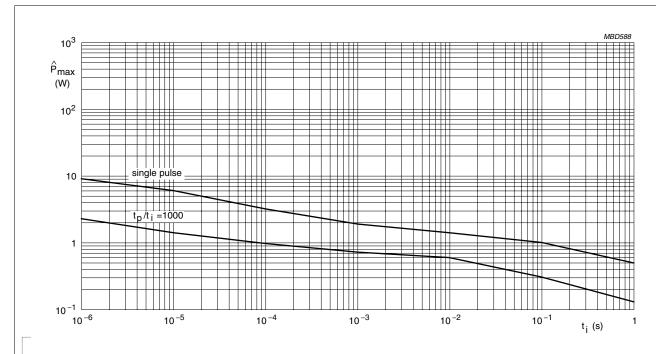


Fig. 7 Pulse on a regular basis for type: RC0805; maximum permissible peak pulse power as a function of pulse duration for single pulse and repetitive pulse tp/ti = 1000

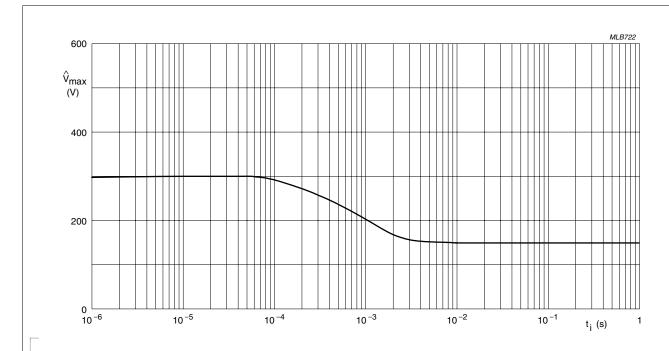


Fig. 8 Pulse on a regular basis for type: RC0805; maximum permissible peak pulse voltage as a function of pulse duration



TESTS AND REQUIREMENTS

Table 4 Test condition, procedure and requirements

Temperature Coefficient of Resistance (T.C.R.) S = 2502-4.8 Formula: T.C.R. = R-P-R × 10 ⁶ (ppm/°C) Where t;=25° C or +125° C test temperature t= t;=25° C or specified room temperature t= t;=25° C or specified room temperature in ohms MILL-STD-202F-method 107G; At −65 (+0/−10) °C for 2 minutes and at +155	TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Formula: T.C.R. Ry-Ri	•		At +25/-55 °C and +25/+125 °C	Refer to table 3
T.C.R= (1-2+1) X 106 (ppm/°C) R ₁ (t ₂ +t ₁) X 106 (ppm/°C) R ₁ (t ₂ +t ₁) X X X X X X X X X			Formula:	
t ₁ =+25 °C or specified room temperature t ₂ =-55 °C rest temperature R ₁ =resistance at reference temperature in ohms R ₂ =resistance at test temperature in ohms At −65 (+0/−10) °C for 2 minutes and at +155 (+10/-0) °C for 2 minutes are at test temperature in ohms At −65 (+0/−5) °C for 1 hour; RCWV applied for 45 (+5/-0) minutes Eleccons at test temperature At −65 (+0/−5) °C for 1 hour; RCWV applied for 45 (+5/-0) minutes ±(1,0%+0.05 Ω) for 1% tol. ±(1,0%+0.05 Ω) for 1% tol. ±(1,0%+0.05 Ω) for 1% tol. ±(2,0%+0.05 Ω) for 1% tol. ±(2,0%+0.05 Ω) for 5% tol. No visible damage Resistance Insulation Resistance MIL-STD-202F-method 301; IEC 60115-1 4.6.1.1 MIL-STD-202F-method 301; IEC 60115-1 4.6.1.1 MIL-STD-202F-method 210C; IEC 60115-1 4.6.1.1 Unmounted chips; 260 ±5 °C for 10 ±1 ±(0,5%+0.05 Ω) for 1% tol. ±(1,0%+0.05 Ω) for 5% tol. No visible damage Life MIL-STD-202F-method 108A; At 70±2 °C for 1,000 hours; RCWV applied for ±(1,0%+0.05 Ω) for 1% tol.	(1.C.N.)		T.C.R= $\frac{R_2-R_1}{R_1(t_2-t_1)} \times 10^6 \text{ (ppm/°C)}$	
$R_1 = resistance \ at \ reference \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ at \ test \ temperature \ in ohms \ R_2 = resistance \ test \ temperature \ in ohms \ test \ temperature \ in ohms \ test \ temperature$				
R2=resistance at test temperature in ohms			t_2 =–55 °C or +125 °C test temperature	
Thermal Shock MIL-STD-202F-method 107G; IEC 60115-1 4.19 At −65 (+0/−10) °C for 2 minutes and at +155 ±(0.5%+0.05 Ω) for 1% tol. ±(1.0%+0.05 Ω) for 5% tol. Low Temperature Operation MIL-R-55342D-Para 4.7.4 At −65 (+0/−5) °C for 1 hour; RCWV applied for 45 (+5/−0) minutes ±(0.5%+0.05 Ω) for 1% tol. ±(1.0%+0.05 Ω) for 1% tol. ±(1.0%+0.05 Ω) for 5% tol. No visible damage Short Time Overload MIL-R-55342D-Para 4.7.5; IEC 60115-1 4.13 2.5 × RCWV applied for 5 seconds at room temperature ±(1.0%+0.05 Ω) for 1% tol. ±(2.0%+0.05 Ω) for 5% tol. No visible damage Insulation Resistance MIL-STD-202F-method 302; IEC 60115-1 4.6.1.1 RCOV for 1 minute ≥10 GΩ Dielectric Withstand Voltage MIL-STD-202F-method 301; IEC 60115-1 4.6.1.1 Maximun voltage (V _{mm}) applied for 1 minute No breakdown or flashover Type RC0805 Voltage (AC) 300 V _{ms} Voltage (AC) 300 V _{ms} ±(0.5%+0.05 Ω) for 1% tol. ±(1.0%+0.05 Ω) for 1% tol. ±(1.0%+0.05 Ω) for 5% tol. No visible damage Resistance to Soldering Heat MIL-STD-202F-method 108A; At 70±2 °C for 1.000 hours; RCWV applied for ±(1.0%+0.05 Ω) for 1% tol. No visible damage			R_1 =resistance at reference temperature in ohms	
Low Temperature Operation			R ₂ =resistance at test temperature in ohms	
Low Temperature Operation	Thermal Shock	MIL-STD-202F-method 107G;	At -65 (+0/-10) °C for 2 minutes and at +155	$\pm (0.5\% \pm 0.05 \ \Omega)$ for 1% tol.
Temperature Operation for 45 (+5/-0) minutes ± (1.0%+0.05 Ω) for 5% tol. No visible damage Short Time Overload MIL-R-55342D-Para 4.7.5; IEC 60115-1 4.13 2.5 × RCWV applied for 5 seconds at room temperature ± (1.0%+0.05 Ω) for 1% tol. ± (2.0%+0.05 Ω) for 1% tol. ± (2.0%+0.05 Ω) for 1% tol. No visible damage Insulation Resistance MIL-STD-202F-method 302; HEC 60115-1 4.6.1.1 RCOV for 1 minute ≥ 10 GΩ Dielectric Withstand Voltage MIL-STD-202F-method 301; HEC 60115-1 4.6.1.1 Maximun voltage (V _{rms}) applied for 1 minute No breakdown or flashover Type RC0805 Voltage (AC) 300 V _{rms} Voltage (AC) 300 V _{rms} Resistance to Soldering Heat MIL-STD-202F-method 210C; Heat Collision (A) (A) (B) (B) (B) (B) (B) (B) (B) (B) (B) (B		IEC 60115-1 4.19	(+10/-0) °C for 2 minutes; 25 cycles	$\pm (1.0\% {+} 0.05~\Omega)$ for 5% tol.
Operation No visible damage Short Time Overload MIL-R-55342D-Para 4.7.5; IEC 60115-1 4.13 2.5 × RCWV applied for 5 seconds at room temperature ± (1.0%+0.05 Ω) for 1% tol. ± (2.0%+0.05 Ω) for 5% tol. No visible damage Insulation Resistance MIL-STD-202F-method 302; IEC 60115-1 4.6.1.1 RCOV for 1 minute ≥10 GΩ Dielectric Withstand Voltage MIL-STD-202F-method 301; IEC 60115-1 4.6.1.1 Maximun voltage (V _{rms}) applied for 1 minute No breakdown or flashover Type RC0805 Voltage (AC) 300 V _{rms} Voltage (AC) 300 V _{rms} No breakdown or flashover Resistance to Soldering Heat MIL-STD-202F-method 210C; Seconds Unmounted chips; 260 ±5 °C for 10 ±1 ± (0.5%+0.05 Ω) for 1% tol. No visible damage Life MIL-STD-202F-method 108A; At 70±2 °C for 1,000 hours; RCWV applied for ± (1%+0.05 Ω) for 1% tol.	Low	MIL-R-55342D-Para 4.7.4	At –65 (+0/–5) °C for I hour, RCWV applied	$\pm (0.5\% \pm 0.05~\Omega)$ for 1% tol .
Short Time Overload MIL-R-55342D-Para 4.7.5; 2.5 × RCWV applied for 5 seconds at room ±(1.0%+0.05 Ω) for 1% tol. ±(2.0%+0.05 Ω) for 5% tol. No visible damage ±(1.0%+0.05 Ω) for 1% tol. ±(1.0%+0.05 Ω) for 5% tol. No visible damage ±(1.0%+0.05 Ω) for 5% tol. No visible damage ±(1.0%+0.05 Ω) for 1% tol. ±(1.0%+0.05	•		for 45 (+5/–0) minutes	$\pm (1.0\% + 0.05~\Omega)$ for 5% tol.
Overload IEC 60115-1 4.13 temperature ± (2.0%+0.05 Ω) for 5% tol. No visible damage Insulation Resistance MIL-STD-202F-method 302; IEC 60115-1 4.6.1.1 RCOV for 1 minute ≥10 GΩ Dielectric Withstand Voltage MIL-STD-202F-method 301; IEC 60115-1 4.6.1.1 Maximun voltage (V _{rms}) applied for 1 minute No breakdown or flashover Type RC0805 Voltage (AC) 300 V _{rms} Voltage (AC) 300 V _{rms} Voltage (AC) 300 V _{rms} Resistance to Soldering Heat IEC 60115-1 4.18 Unmounted chips; 260 ±5 °C for 10 ±1 ± (0.5%+0.05 Ω) for 1% tol. No visible damage Life MIL-STD-202F-method 108A; At 70±2 °C for 1,000 hours; RCWV applied for ± (1%+0.05 Ω) for 1% tol.	Operation			No visible damage
Insulation Resistance IEC 60115-1 4.6.1.1 RCOV for 1 minute Type RC0805 Voltage (DC) 300 V	Short Time	MIL-R-55342D-Para 4.7.5;	2.5 × RCWV applied for 5 seconds at room	\pm (1.0%+0.05 Ω) for 1% tol.
Insulation Resistance IEC 60115-1 4.6.1.1 Type RC0805 Voltage (DC) 300 V	Overload	IEC 60115-1 4.13	temperature	$\pm (2.0\% + 0.05~\Omega)$ for 5% tol.
Type RC0805 Voltage (DC) 300 V				No visible damage
Dielectric Withstand Voltage MIL-STD-202F-method 301; Maximun voltage (V _{rms}) applied for 1 minute No breakdown or flashover Type RC0805 Voltage (AC) 300 V _{rms} ±(0.5%+0.05 Ω) for 1% tol. seconds ±(1.0%+0.05 Ω) for 1% tol. No visible damage ±(1.0%+0.05 Ω) for 1% tol. No visible damage ±(1.0%+0.05 Ω) for 1% tol. The property of the profit tol. The profit tol. The property of the profit tol. The profit	Insulation	MIL-STD-202F-method 302;	RCOV for I minute	≥10 GΩ
Dielectric Withstand Voltage MIL-STD-202F-method 301; Maximun voltage (V _{rms}) applied for 1 minute No breakdown or flashover	Resistance	IEC 60115-1 4.6.1.1	Type RC0805	
Withstand Voltage IEC 60115-1 4.6.1.1 Type RC0805 Voltage (AC) 300 V_{rms} Resistance to Soldering Heat IEC 60115-1 4.18 Unmounted chips; $260 \pm 5 \text{ °C}$ for $10 \pm 1 \pm (0.5\% \pm 0.05 \Omega)$ for 1% tol. No visible damage Life MIL-STD-202F-method 108A; At $70\pm 2 \text{ °C}$ for 1,000 hours; RCWV applied for $\pm (1\% \pm 0.05 \Omega)$ for 1% tol.			Voltage (DC) 300 V	
Withstand Voltage IEC 60115-1 4.6.1.1 Type RC0805 Voltage (AC) 300 V_{rms} Resistance to Soldering Heat IEC 60115-1 4.18 Unmounted chips; $260 \pm 5 \text{ °C}$ for $10 \pm 1 \pm (0.5\% \pm 0.05 \Omega)$ for 1% tol. No visible damage Life MIL-STD-202F-method 108A; At $70\pm 2 \text{ °C}$ for 1,000 hours; RCWV applied for $\pm (1\% \pm 0.05 \Omega)$ for 1% tol.	Dielectric	MIL-STD-202F-method 301;	Maximun voltage (V) applied for 1 minute	No breakdown or flashover
VoltageVoltage (AC) 300 V_{rms} Resistance to Soldering HeatMIL-STD-202F-method 210C; IEC 60115-1 4.18Unmounted chips; $260 \pm 5 ^{\circ}$ C for 10 ± 1 seconds $\pm (0.5\% \pm 0.05 \Omega)$ for 1% tol. No visible damageLifeMIL-STD-202F-method 108A;At $70\pm 2 ^{\circ}$ C for 1,000 hours; RCWV applied for $\pm (1\% \pm 0.05 \Omega)$ for 1% tol.	Withstand			
Soldering Heat $\pm (1.0\% + 0.05 \ \Omega)$ for 5% tol. No visible damage $\pm (1.0\% + 0.05 \ \Omega)$ for 1% tol. Life MIL-STD-202F-method I08A; At 70 ± 2 °C for I,000 hours; RCWV applied for $\pm (1\% + 0.05 \ \Omega)$ for 1% tol.	Voltage			
Soldering Heat $\pm (1.0\% + 0.05 \ \Omega)$ for 5% tol. No visible damage $\pm (1.0\% + 0.05 \ \Omega)$ for 1% tol. Life MIL-STD-202F-method I08A; At 70 ± 2 °C for I,000 hours; RCWV applied for $\pm (1\% + 0.05 \ \Omega)$ for 1% tol.				
Heat No visible damage Life MIL-STD-202F-method I08A; At 70±2 °C for I,000 hours; RCWV applied for ±(1%+0.05 Ω) for 1% tol.				,
Life MIL-STD-202F-method I08A; At 70±2 °C for I,000 hours; RCWV applied for \pm (1%+0.05 Ω) for 1% tol.	•	IEC 60115-1 4.18	Secolus	,
				No visible damage
IEC 60115-1 4.25.1	Life	MIL-STD-202F-method I08A;	At 70±2 °C for 1,000 hours; RCWV applied for	\pm (1%+0.05 Ω) for 1% tol.
		IEC 60115-1 4.25.1	1.5 hours on and 0.5 hour off	$\pm (3\% {+} 0.05~\Omega)$ for 5% tol.

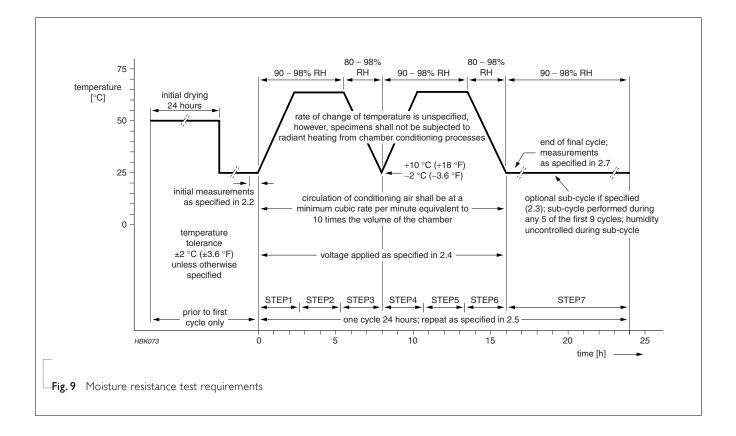


Chip Resistor Surface Mount RC SERIES 0805 (Pb Free)

ST	TEST METHOD	PROCEDURE	REQUIREMENTS	
Solderability	MIL-STD-202F-method 208A;	Solder bath at 245±3 °C	Well tinned (≥95% covered	
•		Dipping time: 2±0.5 seconds	No visible damage	
Bending	JIS ⊂ 5202.6.14;	Resistors mounted on a 90 mm glass epoxy	\pm (1.0%+0.05 Ω) for 1% tol. \pm (1.0%+0.05 Ω) for 5% tol. No visible damage	
Strength	IEC 60115-1 4.15	resin PCB (FR4)		
		Bending: 5 mm		
Resistance to	MIL-STD-202F-method 215;	Isopropylalcohol (C ₃ H ₇ OH) or dichloromethane	No smeared	
Solvent	IEC 60115-1 4.29	(CH ₂ Cl ₂) followed by brushing		
Noise	JIS C 5202 5.9;	Maximum voltage (V _{ms}) applied.	Resistors range Va	
	IEC 60115-1 4.12		R < 100 Ω	10 dB
			$100 \Omega \le R < 1 K\Omega$	20 dB
			$1 \text{ K}\Omega \leq R < 10 \text{ K}\Omega$	30 dB
			$10 \text{ K}\Omega \leq R < 100 \text{ K}\Omega$	40 dB
			$100 \text{ K}\Omega \leq \text{R} < 1 \text{ M}\Omega$	46 dB
			$1 \text{ M}\Omega \leq R \leq 22 \text{ M}\Omega$	48 dB
Humidity	JIS C 5202 7.5;	1,000 hours; 40±2 °C; 93(+2/–3)% RH	+(0.5%+0.05. 0) for 19	í tol
Humidity (steady state)	JIS C 5202 7.5; IEC 60115-8 4.24.8	I,000 hours; 40±2 °C; 93(+2/–3)% RH RCWV applied for I.5 hours on and 0.5 hour off	\pm (0.5%+0.05 Ω) for 1% \pm (2.0%+0.05 Ω) for 5%	
•	•	·	,	
(steady state)	IEC 60115-8 4.24.8	RCWV applied for 1.5 hours on and 0.5 hour off	$\pm (2.0\% + 0.05 \ \Omega)$ for 5%	
(steady state) Leaching Intermittent	IEC 60115-8 4.24.8 EIA/IS 4.13B;	RCWV applied for 1.5 hours on and 0.5 hour off Solder bath at 260 ± 5 °C Dipping time: 30 ± 1 seconds	$\pm (2.0\% + 0.05 \ \Omega)$ for 5%	ś tol.
(steady state) Leaching	IEC 60115-8 4.24.8 EIA/IS 4.13B; IEC 60115-8 4.18	RCWV applied for 1.5 hours on and 0.5 hour off Solder bath at 260 ± 5 °C Dipping time: 30 ± 1 seconds	$\pm (2.0\% + 0.05 \ \Omega)$ for 5% No visible damage	ś tol.
(steady state) Leaching Intermittent	IEC 60115-8 4.24.8 EIA/IS 4.13B; IEC 60115-8 4.18	RCWV applied for 1.5 hours on and 0.5 hour off Solder bath at 260±5 °C Dipping time: 30±1 seconds At room temperature; 2.5 × RCWV applied for 1 second on and 25 seconds off; total 10,000	$\pm (2.0\% + 0.05 \ \Omega)$ for 5% No visible damage $\pm (1.0\% + 0.05 \ \Omega)$ for 1%	ś tol.
Leaching Intermittent Overload Resistance to Vibration Moisture	IEC 60115-8 4.24.8 EIA/IS 4.13B; IEC 60115-8 4.18 JIS C 5202 5.8	RCWV applied for 1.5 hours on and 0.5 hour off Solder bath at 260±5 °C Dipping time: 30±1 seconds At room temperature; 2.5 × RCWV applied for 1 second on and 25 seconds off; total 10,000 cycles	$\pm (2.0\% + 0.05 \ \Omega)$ for 5% No visible damage $\pm (1.0\% + 0.05 \ \Omega)$ for 1%	6 tol. 6 tol. 6 tol.
Leaching Intermittent Overload Resistance to Vibration	IEC 60115-8 4.24.8 EIA/IS 4.13B; IEC 60115-8 4.18 JIS C 5202 5.8 On request	RCWV applied for 1.5 hours on and 0.5 hour off Solder bath at 260±5 °C Dipping time: 30±1 seconds At room temperature; 2.5 × RCWV applied for 1 second on and 25 seconds off; total 10,000 cycles On request	$\pm (2.0\% + 0.05~\Omega)$ for 5% No visible damage $\pm (1.0\% + 0.05~\Omega)$ for 1% $\pm (2.0\% + 0.05~\Omega)$ for 5%	6 tol. 6 tol. 6 tol.



0805 (Pb Free)









REVISION HISTORY

YAGEO

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 2	Sep 03, 2004	-	- Test method and procedure updated
			- PE tape added (paper tape will be replaced by PE tape)