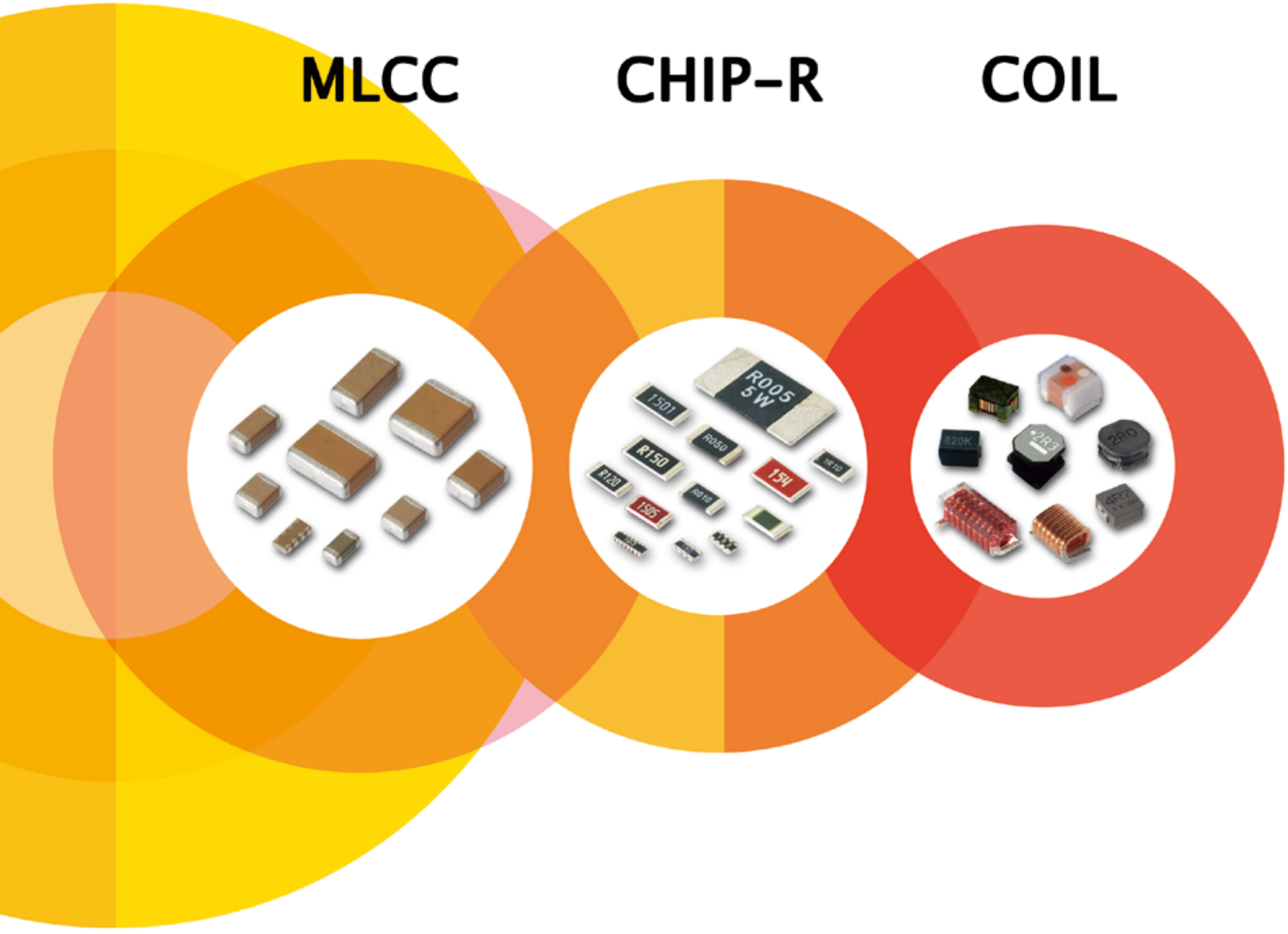
PSA

PASSIVE SYSTEM ALLIANCE

MLCC CHIP-R COIL



PDC

信昌電子陶瓷

Prosperity Dielectrics Co., Ltd.

ABOUT PDC

Milestone 歷史沿革

1990	PDC former parent company, Taiwan Cement, merged with Mei Da Mei and founded PDC in Nantou. 台泥集團購買美大美電子公司，信昌電子陶瓷正式成立。
1995	PDC merged with Taiwan Precision Material Corporation. 信昌電子陶瓷併購台灣精密材料公司。
2002	Public Listed in OTC. 信昌電子陶瓷正式上櫃。
2005	PDC was strategically allied with Wasin Tech. 與華新科技 (股) 公司策略聯盟。
2007	To be strategically allied with Frontier, and setting up new production lines, Magnetic components. 與弘電電子工業 (股) 公司策略聯盟，生產磁性材料元件。
2008	Positioned as Specialty and Material BG in PSA Group. 集團推動 PSA 被動系統聯盟企業識別，信昌電子陶瓷定位為特殊品及材料事業群。

Core Technology 關鍵技術

1988	Manufacturing and developing ceramic dielectric materials. 生產製造圓板電容粉末、開發。
1990	Manufacturing Multilayer Ceramic Capacitors. 生產製造積層陶瓷晶片電容。
1995	Manufacturing Ceramic Chip Resistors and Ceramic Chip Coil 生產陶瓷晶片電阻、陶瓷晶片電感。
2001	As the 1st manufacturer and provider in Taiwan for ceramic dielectric powders and multilayer ceramic chip capacitors (MLCC). 臺灣第一家自行供給晶片電容器介電瓷粉之被動元件廠商。
2001	With self-made conducting dielectric powder, controlling the complete key technology from material to manufacture. 自製半導性介電瓷粉，掌握由材料至製程的完整關鍵性技術。
2007	Manufacturing magnetic components. 生產磁性材料元件。

Brand Value 品牌價值

2001	The first supplier in Asia to get SEMKO product safety certificate. 亞洲第一家獲得 SEMKO 安全規格認證之供應商。
2003	ISO 9001 certificated. 獲 ISO 9001 驗證通過。
2004	Industrial Sustainable Excellence Award. 榮獲經濟部工業局工業精銳獎。
2004	TS16949、ISO 14000 and OHSAS 18000 certificated. 獲 TS16949、ISO 14000 及 OHSAS 18000 驗證。
2007	Common Wealth Magazine Top 1000 Manufacturers in Taiwan Ranked in No. 705. 天下雜誌 1000 大製造業排名第 705 名。
2008	IECQ QC080000 HSF certificated. 獲 IECQ QC080000 HSF 驗證。
	Common Wealth Magazine Top 1000 Manufacturers in Taiwan Ranked in No. 682. 天下雜誌 1000 大製造業排名第 682 名。
2009	Common Wealth Magazine Top 1000 Manufacturers in Taiwan Ranked in No. 677. 天下雜誌 1000 大製造業排名第 677 名。
2012	Recognition of Winning the Silver Invention Award for Copper or Its Alloy Cofirable Dielectric Ceramics. 榮獲國家發明創作獎 - 發明獎銀牌「可與銅及其合金進行共燒製作的介電陶瓷組成物」
2013	SMD High Voltage Chip Resistor passed UL Safety certification in 2013 電阻產品取得安規認證證書
2015	MLCC product have obtained the IECQ certificate & the certificate of AS9100 management system for the aerospace industry. 通過 IECQ 第三方認證及 AS9100 航太工業管理系統驗證。
2016	Aerospace Quality Management Systems AS 9100 certificated. 晶片電容取得車規第三方認證
2019	PDC was selected fastest growing Top 100 companies in 2019 by commonwealth magazine PDC 榮獲天下雜誌 2019 年成長 100 強企業

Market Performance 市場表現

The only local manufacturer in Taiwan with the capability in specialty products includes multiple-layer ceramic capacitors, chip resistors, and coils.
國內唯一可全數提供特殊電容、電感、電阻之被動元件供應商。
The only local manufacturer in Taiwan entered the supply chain of Japan market.
國內唯一打入日本供應鏈之廠商。

Introduction

Prosperity Dielectrics Co., Ltd. (PDC) was founded in 1990 as the 1st local manufacturer and exporter in Taiwan for ceramic dielectric powders and multiple-layer ceramic chip capacitors (MLCCs). PDC joined to Walsin Technology Corporation (WTC) as an allied company in September 2005, and incorporated Frontier to create solid synergy in 2008. Our product lines expand to SMD magnetic chips, power chokes, coils and transformers.

信昌電子陶瓷成立於 1990 年，為國內少數能自行供給瓷粉原料並同時銷售積層陶瓷電容的被動元件廠商，更是唯一有能力由上游初發原料，向下垂直整合至被動晶片元件的廠商。2005 年信昌電陶與華新集團進行策略聯盟、2008 年正式合併弘電電子，將銷售範圍從介電瓷粉、半導性陶瓷電容器瓷片、積層陶瓷電容、晶片電阻延伸到線圈，成為國內唯一可全數提供特殊電容、電感、電阻之被動元件供應商。

Support You Forward

With niche technology of key materials, PDC can meet the market requirements. The integration of researching and developing from materials to the customer-required components can shorten the time of mass production. To progressively make plans for each product to be with high added value functions, such as Mid and high voltage, high precision, large size capacitors, and high power, high precision, low resistance resistors or other high added value products. In the future, combine with core material technology and advance high frequency and high capacitance further.

由於掌握關鍵性材料的技術利基，信昌電陶可配合市場需求，由材料研發著手，向下整合開發客戶所需要的電子元件，縮短量產時效，並積極規劃各項產品朝高附加價值的零件功能領域邁進，如：中高壓、高精度、大尺寸之晶片電容器及高功率、高精度與低阻值之晶片電阻器等高附加價值產品。未來更將結合材料核心技術，進軍高頻及高容領域。

At present, PDC has developed ceramic dielectric powder used by NME and BME manufacturing process. Self-applied mass production and external sale are simultaneously carried out to improve the proportion to the supply of internal high-level MLCC materials. By the strategy of vertical production capability from ceramic dielectric powder material to MLCC finished goods, bring the high performance of vertical integration.

目前信昌電陶貴金屬製程及卑金屬製程（BME）使用的晶片電容器介電瓷粉已陸續開發完成，量產自用與對外銷售並行展開，提升國內高階積層電容瓷粉原料自主供應比率。藉由原料往下游整合至晶片電容器成品的延伸策略，發揮上下垂直整合的高度營運績效。

For the past few years, to extend the production capability of magnetic components series, PDC gradually set up the manufacturing equipments for coil and transformer in Yongzhou and Shenzhen Plant. The improvement of the production capability is able to increase the sales performance.

近年來，為了擴展磁性元件系列產品的產能，信昌電陶陸續在中國永州廠、深圳廠增置電感、變壓器相關製造設備，藉由產能提升，大幅拉升業績。

Vertical integration & Complete key technology:
- Material (Ceramic Dielectric Powder)
- Semi-finished good (Semiconducting Ceramic Chip Capacitor)
- Finished goods (Chip Capacitor, Chip resistor, Coil)

上下游垂直整合，掌握完整關鍵性技術：
- 原料 (介電瓷粉)
- 半成品 (半導性陶瓷電容瓷片)
- 成品 (晶片電容、晶片電阻、線圈)

Business Operation 經營模式分析

- Vertical integration to improve competitiveness.
- Building strategic alliances to strengthen competitiveness.
- Expanding Western and Japanese markets, cultivation high-end products.
- Moving into Chinese market to expand market share.
- 垂直整合發展，擺脫同業競爭
- 運用策略聯盟，產品水平延伸
- 拓展歐美日市場，深耕高階產品
- 跨足中國市場，擴大市佔率

Branding Strategy 品牌經營策略

- Developing specialized products market.
- Enhancing brand value with continuing innovation and R&D ability.
- Improving competitiveness through vertical integration.
- Satisfying customer's need through extending product lines.
- 深耕被動元件特殊品市場及其上游材料產業高階產品
- 持續創新研發能力，提升品牌價值
- 產品垂直整合，強化競爭優勢
- 產品水平延伸，滿足客戶一次購足

Keystothe Success 關鍵成功因素

- The only local manufacturer with vertical production capability from ceramic dielectric powder material to multiple-layer ceramic chip capacitors.
- Differentiating marketing strategy with niche product.
- Diversifying product lines to expand customer base.
- Continuing innovation and R&D ability.
- Focusing core competence with PSA group support.
- 國內唯一有能力由上游初發原料，向下垂直整合至被動晶片元件的廠商，掌握材料與製程的完整關鍵性技術
- 利基產品差異化與行銷差異化策略
- 產品線多元發展，擴大客戶群
- 持續創新與研發，開發新產品與導入新製程
- 共享集團資源，聚焦核心競爭力

Characteristics 企業特色

- PDC is the domestic manufacturer devoting to ceramic dielectric materials.
- 為國內廠商對介電瓷粉材料研發投注最深者

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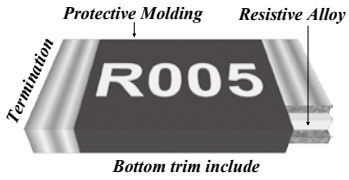
- 內部記載之產品規格僅提供參考，實際規格請依照我司標準承認書為準。

Chip R-Contents

FMF

■ Metal Strip Type Lead Free Current Sensing Resistors



FEATURES

- High power rating and low TCR.
- Low resistance and high precision (1%).
- Low inductance design, less than 1.0nH available.
- Inductance less than 1.0nH.
- Excellent reliability and suitable cost.
- Suitable for lead free soldering.
- High precision trimming implement.
- RoHS compliant & Halogen Free.

APPLICATION

- Switching model power supply.
- Battery pack.
- Notebook, Tablet PC.
- Test Instrument.
- Power Amplifier.

PART NUMBER

FMF	25	F	P	J	R005	-	BH
Type □□□	Size □□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR □	Special Code
FMF Metal strip	**06** 1206 **25** 2512	**F** = ±1% **G** = ±2% **J** = ±5%	**T** = Paper Tape 4Kpcs (For 1206) 5Kpcs (1206 _K) **P** = Plastic Tape 4Kpcs (For 2512)	**F** = 1/2W **H** = 1W **I** = 1.5W **J** = 2W **K** = 3W	**XXXX** 4 digit **Jumper** : 000_ _ : means blank.	**"–" Standard** **X** = code of 2512 R001. R002.	**LH** = Standard **BH** = Low EMF **K** = K Type AEC-Q200 **LHM** = Standard **BHM** = Low EMF

RATING

Type	Power Rating @ 70℃	Max. Working Current (Voltage)*	Max. Overload Current (Voltage)*	Alloy Type	Resistance Tolerance (%)	Temperauture Coefficient of Resistance (ppm/℃)	Resistance (mΩ)
FMF06 1206	0.5W	12.9A (111mV)	28.9A (250mV)	Low EMF	±1%(F) ±2%(G) ±5%(J)	±70	3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25
		10.0A (111mV)	22.4A (250mV)	Standard		±50	5, 10, 15, 15.5, 18, 20, 25, 30
	1W	18.3A (158mV)	40.8A (354mV)	Low EMF		±70	3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25
		14.1A (173mV)	31.6A (387mV)	Standard		±50	5, 10, 15, 15.518,2 0, 25, 30
FMF25 2512	1W	31.6A (158mV)	70.7A (354mV)	Low EMF	±1%(F) ±2%(G) ±5%(J)	±70	1, 2, 2.5, 3, 4, 5, 10, 15, 20, 25
		18.3A (469mV)	40.8A (1049mV)	Standard		±50	3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 20, 22, 25, 30 33, 35, 40, 50, 60, 70, 75, 80, 100, *200, *220
	2W	44.7A (224mV)	100A (500mV)	Low EMF		±70	1, 2, 2.5, 3, 4, 5, 10, 15, 20, 25
		25.8A (663mV)	57.7A (1483mV)	Standard		±50	3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 20, 22, 25, 30 33, 35, 40, 50, 60, 70, 75, 80, 100, *200, *220
	3W	31.6A (245mV)	70.7A (548mV)	Low EMF		±70	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
						±50	20
		24.5A (812mV)	54.8A (1817mV)	Standard		±70	5, 6, 8, 10
						±50	12, 14, 15, 16, 18, 20, 25, 30, 33, 35, 40, 50 60, 75, 80, 100, *200, *220

Note : *200, *220 Under develop

K TYPE

Type	Power Rating @ 70℃	Max. Working Current*	Max. Overload Current* (2 sec)	Tolerance (%)	Temperauture Coefficient of Resistance (ppm/℃)**	Resistance (mΩ)***
FMF06_K	1W	31.6A	79.1A	±1%(F) ±5%(J)	±100	1
		22.4A	55.9A		±70	2
	1.5W	38.7A	96.8A		±70	1
		27.4A	68.5A		±70	2
FMF25_K	2W	63.2A	158.1A	±5%(J)	±70	0.5

Note :
(1) RCWV = $(P \times R)^{1/2}$ or Max. RCWV listed above, whichever is lower.
RCWV：Rated Continue Working Voltage(V)，P：Rated Power(W)，R：Resistance Value(Ω)
(2) Solder-pad and trace size should be >300 mm^2 and board surface temperature should not exceed 105℃ when applying rated power
(3) * : Related number are depend on specific items only.
** : TCR Hot (+25~+155℃).
*** : Special requests and details please contact factory.

■ Metal Strip Type Lead Free Current Sensing Resistors

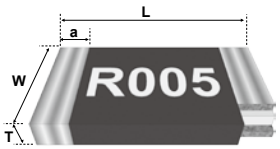
Metal Jumper

Type	Max. Working Current	Max. Overload Current	Resistance
FMF06 1206 (FMF06JTH000 –LH)	80A	100A	Max. 0.2mΩ
FMF25 2512 (FMF25JPJ000 –LH)	120A	150A	Max. 0.1mΩ

GUIDE OF CURRENT SENSING RESISTORS

Series	Product Type	Resistance Range (<1 Ω)	Power Type	AEC Q200
FMF	**Metal Strip**	**0mΩ~220mΩ**	**V**	**V**
FOF	Metal Foil	2mΩ~700mΩ	V	
FBF	Metal Paste	10mΩ~ 910mΩ	V	
FPF	High Power	50mΩ~ 910mΩ	V	V
FCF-E	Normal	50mΩ~ 910mΩ		

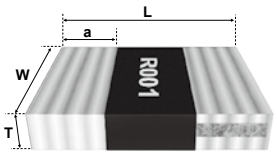
DIMENSIONS



Note. Precise data please refer detail spec. unit: mm

Type	L	W	T	a
FMF06 3m~30m	3.10±0.20	1.65±0.20	0.60±0.20	0.60±0.20
FMF25 2.5m~220m	6.20±0.20	3.25±0.20	0.60±0.20	0.80±0.20
FMF25 3m~220m 3W	6.20±0.20	3.25±0.20	0.65±0.20	0.80±0.20

For FMF25 1m~2m & K Type



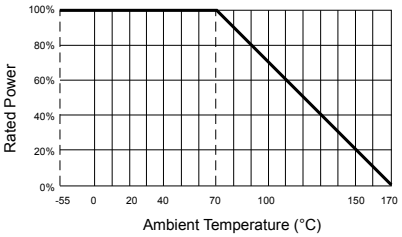
FMF25 1m~2m unit: mm

Type	L	W	T	a
FMF25 1m~2m	6.40±0.20	3.25±0.20	0.70±0.20	2.00±0.20
FMF25 1m~2m 3W	6.40±0.20	3.25±0.20	0.80±0.20	2.00±0.20

K TYPE unit: mm

Type	L	W	T	a	Marking
FMF06 1mΩ	3.20±0.15	1.60±0.15	0.32±0.15	1.10±0.25	01
FMF06 2mΩ	3.20±0.15	1.60±0.15	0.32±0.15	0.50±0.25	02
FMF25_K 0.5m	6.30±0.25	3.10±0.25	0.58±0.15	2.20±0.25	0L50

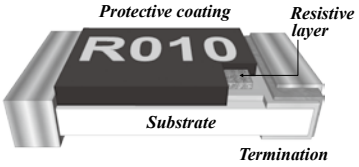
POWER DE-RATING CURVE



Operating Temperature Range: -55 to +170 deg.C

FBF

■ Metal Paste Type High Power Lead Free Chip Resistors



FEATURES

- Low resistance and high precision (1%).
- Excellent reliability and suitable cost.
- Suitable for lead free soldering.
- RoHS compliant & Halogen Free.

APPLICATION

- Consumer electronics, M/B.
- Battery pack, BTC.
- Notebook, Tablet PC.
- Portable Device, Electroni Equipment.

PART NUMBER

FBF	25	F	P	P	R100		
Type □□□	Size □□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR	Special Code
FBF Metal Paste	**03** 0603 **05** 0805 **06** 1206 **12** 1210 **20** 2010 **25** 2512	**F** = ±1% **G** = ±2% **J** = ±5%	**T** = Paper Tape 5Kpcs **P** = Plastic Tape 4Kpcs	**" -"** = Standard ***P** = Power Enhance	**XXXX** 4 digit	No special code- Null special code- "-"	**"Null"** Standard **K:** R010~R018 Controlcode

RATING

Type		Normal Type Power Rating @ 70℃	Power Type Rating Power @ 70℃	Resistance Tolerance (%)	Temperauture Coefficient of Resistance (TCR ; ppm/℃)	Resistance Range (mΩ) Min.	Resistance Range (mΩ) Max.	Standard Resistance Values
FBF03	**0603**	1/8W	*1/4W	±1% , ±2%, ±5%	±200	40	91	E-24 Special Request Please Contact Factory
					±100	100	910	
FBF05	**0805**	1/4W	*1/2W	±1% , ±2%, ±5%	±400~±200	10	46	
					±100	47	910	
FBF06	**1206**	1/3W	*3/4W	±1% , ±2%, ±5%	±400~±200	10	46	
					±100	47	910	
FBF12	**1210**	2/3W	*3/4W	±1% , ±2%, ±5%	±400~±200	10	46	
					±100	47	910	
FBF20	**2010**	3/4W	*1W	±1% , ±2%, ±5%	±400~±200	10	46	
					±100	47	910	
FBF25	**2512**	1W	*2W	±1% , ±2%, ±5%	±400~±200	10	46	
					±100	47	910	

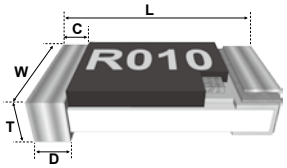
Note : (1) RCWV = $(P \times R)^{1/2}$ or Max. RCWV listed above, whichever is lower.
RCWV：Rated Continue Working Voltage(V)，P：Rated Power(W)，R：Resistance Value(Ω)
(2) Above 2512 size, solder-pad and trace size should be >300 mm^2 and board surface temperature should not exceed 105℃ when applying full rated power.

GUIDE OF CURRENT SENSING RESISTORS

Series	Product Type	Resistance Range (<1Ω)	Power Type	AEC Q200
FMF	Metal Strip	0mΩ~220mΩ	V	V
FOF	Metal Foil	2mΩ~700mΩ	V	
FBF	**Metal Paste**	**10mΩ~910mΩ**	**V**	
FPF	High Power	50mΩ~910mΩ	V	V
FCF-E	Normal	50mΩ~910mΩ		

DIMENSIONS

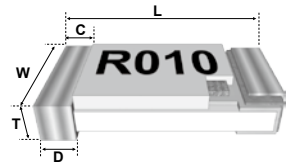
Type 1 : Resistance ≧ 40mΩ



unit: mm

Type 1	L	W	C	D	T
FBF03	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
FBF05	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
FBF06	3.10±0.10	1.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
FBF12	3.10±0.10	2.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
FBF20	5.00±0.20	2.50±0.20	0.60±0.25	0.60±0.25	0.60±0.10
FBF25	6.30±0.20	3.10±0.20	0.60±0.25	0.90±0.25	0.60±0.15

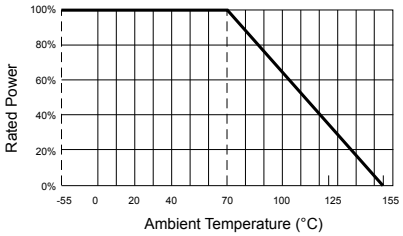
Type 2 : Resistance ≦ 39mΩ



unit: mm

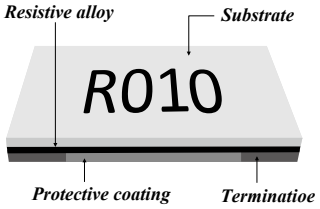
Type 2	L	W	C	D	T
FBF03	1.60±0.10	0.80±0.10	0.30±0.20	0.50±0.20	0.50±0.10
FBF05	2.00±0.10	1.25±0.10	0.40±0.20	0.65±0.20	0.60±0.10
FBF06	3.10±0.10	1.60±0.10	0.50±0.25	0.90±0.25	0.65±0.10
FBF12	3.10±0.10	2.60±0.10	0.50±0.25	0.90±0.25	0.65±0.10
FBF20	5.00±0.20	2.50±0.20	0.60±0.25	1.25±0.25	0.65±0.10
FBF25	6.30±0.20	3.10±0.20	0.60±0.25	1.90±0.25	0.65±0.15

POWER DE-RATING CURVE



Maximum dissipation in percentage of rated power as a function of the ambient temperature for 0603, 0805, 1206, 1210, 2010, 2512

■ Power/Anti-Sulfur Lead Free Current Sensing Resistors



FEATURES

- Ultra low and stable TCR performance.
- High power rating and compact size.
- High reliability and stability.
- Reduced size of final equipment.
- RoHS exemption free & Lead free.
- ASTM B-809 105C 1000hrs compliant.

APPLICATION

- Power supply.
- PDA.
- Digital meter.
- Computer.
- Automotives.
- Battery charger.
- DC-DC power converter.

PART NUMBER

FOF	25	F	P	J	R005	N	SS
Type □□□	Size □□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR □	Special Code □□
FOF Metal Foil	**02** 0402 **03** 0603 **05** 0805 **06** 1206 **25** 2512	**D** =±0.5% **F** =±1% **J** =±5%	**T** =Paper tape – 5 Kpcs **V** =Paper tape – 10Kpcs **P** =Plastic tape – 4Kpcs	**E** =1/3W **F** =1/2W **G** =3/4W **H** =1W **J** =2W	**XXXX** 4 digit	**N** =100PPM **X** =70ppm **P** =50PPM	**SS :** Standard

RATING

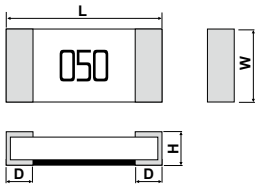
Series No.	FOF25	FOF06	FOF05	FOF03	FOF02
Size code	**2512 (6432)**	**1206 (3216)**	**0805 (2012)**	**0603 (1608)**	**0402 (1005)**
Resistance Tolerance	±5% , ±1%, ±0.5% (only for TC50)				
Resistance Range	2~450, 700 mΩ	3~700 mΩ	3~500 mΩ	5~75 mΩ	5~25 mΩ
TCR (ppm/℃)	2~9mΩ: ±100	3~9mΩ: ±100	3~9mΩ: ±100	5~9mΩ: ±100	5~25mΩ: ±100
	10~700mΩ: ±50	10~700mΩ: ±50	10~500mΩ: ±50	10~75mΩ: ±50	
Max. power at Tamb=70℃	2W	1W	3/4W	1/2W	1/3W
Operation Temperature	-55 ~ +155℃				

Note : (1) Max. Operation Current : So called RCWC (Rated Continuous Working Current) is determined by RCWC = $\sqrt{\text{Rated Power / Resistance Value}}$ listed above

GUIDE OF CURRENT SENSING RESISTORS

Series	Product Type	Resistance Range (<1Ω)	Power Type	AEC Q200
FMF	Metal Strip	0mΩ~220mΩ	V	V
FOF	**Metal Foil**	**2mΩ~700mΩ**	**V**	
FBF	Metal Paste	10mΩ~ 910mΩ	V	
FPF	High Power	50mΩ~ 910mΩ	V	V
FCF-E	Normal	50mΩ~ 910mΩ		

DIMENSIONS

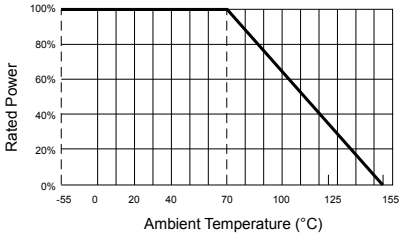


unit: mm

Type	R-value	L	W	H	D
FOF25	R002	6.4±0.30	3.2±0.30	0.65±0.20	2.8±0.30
	R003	6.4±0.30	3.2±0.30	0.65±0.20	2.6±0.30
	R004-R009	6.4±0.30	3.2±0.30	0.65±0.20	1.05±0.30
	R010-R049	6.4±0.30	3.2±0.30	0.65±0.20	1.05±0.30
	R050-R700	6.4±0.30	3.2±0.30	0.65±0.20	1.05±0.30
FOF06	R003	3.3±0.20	1.7±0.20	0.65±0.20	1.20±0.30
	R004-R008	3.3±0.20	1.7±0.20	0.65±0.20	0.68±0.30
	R009-R049	3.3±0.20	1.7±0.20	0.65±0.20	0.68±0.30
	R050-R700	3.3±0.20	1.7±0.20	0.65±0.20	0.68±0.30
FOF05	R003	2.10±0.20	1.35±0.20	0.65±0.20	0.65±0.20
	R004	2.10±0.20	1.35±0.20	0.65±0.20	0.50±0.20
	R005-R007	2.10±0.20	1.35±0.20	0.65±0.20	0.50±0.20
	R008-R049	2.10±0.20	1.35±0.20	0.65±0.20	0.50±0.20
	R050-R500	2.10±0.20	1.35±0.20	0.65±0.20	0.50±0.20
FOF03	R005	1.7±0.20	0.9±0.20	0.65±0.20	0.50±0.20
	R006-R009	1.7±0.20	0.9±0.20	0.65±0.20	0.40±0.20
	R010-R049	1.7±0.20	0.9±0.20	0.65±0.20	0.40±0.20
	R050-R075	1.7±0.20	0.9±0.20	0.65±0.20	0.40±0.20
FOF02	R005-R025	1.0±0.10	0.55±0.10	0.30±0.05	0.23±0.10

POWER DE-RATING CURVE

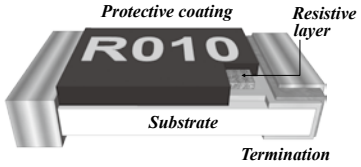
Operating Temperature Range: -55 to +155 deg.C



Maximum dissipation in percentage of rated power as a function of the ambient temperature

FPF-L

■ Current Sensing Thick-film Power Type Chip Resistors



FEATURES

- High power rating to 2W and low TCR.
- Low resistance and high precision (1%).
- Excellent reliability and suitable cost.
- Suitable for lead free soldering.
- Meet AEC-Q200, RoHS compliant & Halogen Free.

APPLICATION

- Consumer electronics, M/B.
- Battery pack, BTC.
- Notebook, Tablet PC.
- Portable Device, Electronic Equipment.

PART NUMBER

FPF	25	F	P	-	R005	-	M
Type □□□	Size □□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR	Special Code
FPF Thick Film High Power Low ohm	**03** 0603 **05** 0805 **06** 1206 **12** 1210 **20** 2010 **25** 2512	**F** =±1% **G** =±2% **J** =±5%	**T** =Paper tape – 5 Kpcs **V** =Paper tape – 10Kpcs **W** =Paper tape – 20Kpcs **P** =Plastic tape – 4Kpcs **X** =Plastic tape – 8Kpcs **Y** =Plastic tape – 16Kpcs **Q** =Plastic tape – 3 Kpcs (For 2512 3W)	**"–"** Standard Power boost code **K** =3W (2512)	**XXXX** 4 digit	No special code- Null special code- "–" Power boost code **N** =100ppm **L** =200ppm	**"Null"** Standard **M:** Meet AEC-Q200

RATING

Type		Normal Type Power Rating @ 70℃	Max. RCWV (mV)	Max. Overload Voltage (mV)	Resistance Tolerance (%)	Temperauture Coefficient of Resistance (TCR ; ppm/℃)	Resistance Range (mΩ) Min.	Resistance Range (mΩ) Max.	Standard Resistance Values
FPF03	**0603**	1/4W	477	1066	±1%, ±5%	±250	50	91	E-24 Special request please contact sales window
						±150*	100	910	
FPF05	**0805**	1/3W	551	1232	±1%, ±5%	±200	50	91	
						±100*	100	910	
FPF06	**1206**	1/2W	675	1508	±1%, ±5%	±100*	50	91	
						±100	100	910	
FPF12	**1210**	1/2W	675	1508	±1%, ±5%	±100	100	910	
FPF20	**2010**	1W	954	2133	±1%, ±5%	±100*	50	91	
						±100	100	910	
FPF25	**2512**	2W	1349	3017	±1%, ±5%	±100*	50	91	
						±100	100	910	
FPF25	**2512**	3W	1652	3695	±1%	±100	100	910	
					±5%	±200	100	910	

* Temperature 25~-55℃ , 200ppm for 0603, 150ppm for 0805, 1206, 2010, 2512

Note :

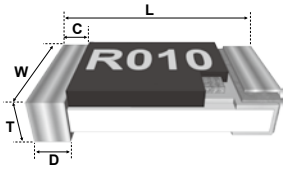
(1) 2512(2W) loading with total solder-pad and trace size of 300 mm^2
2512(3W) Solder-pad and trace size should be >300 mm^2 and board surface temperature should, not exceed 105℃ when applying full rated power.

(2) $E = (P \times R)^{1/2}$ E：Working Voltage(V) , P：Rated Power(W) , R：Resistance Value(Ω)

GUIDE OF CURRENT SENSING RESISTORS

Series	Product Type	Resistance Range (<1Ω)	Power Type	AEC Q200
FMF	Metal Strip	0mΩ~220mΩ	V	V
FOF	Metal Foil	2mΩ~700mΩ	V	
FBF	Metal Type	10mΩ~910mΩ	V	
FPF	**High Power**	**50mΩ~910mΩ**	**V**	**V**
FCF-E	Normal	50mΩ~910mΩ		

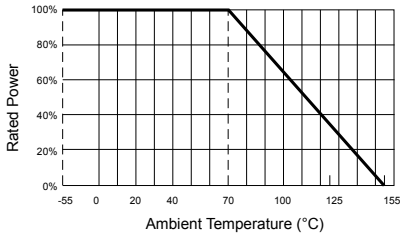
DIMENSIONS



unit: mm

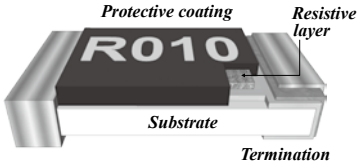
Type	L	W	C	D	T
FPF03	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
FPF05	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
FPF06	3.10±0.10	1.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
FPF12	3.10±0.10	2.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
FPF20	5.00±0.20	2.50±0.20	0.65±0.25	0.60±0.25	0.60±0.10
FPF25	6.40±0.20	3.10±0.20	0.60±0.25	1.80±0.25	0.60±0.15
FPF25 3W	6.40±0.20	3.10±0.20	0.45±0.25	1.80±0.25	1.10±0.20

POWER DE-RATING CURVE



Operating Temperature Range: -55 to +155 deg.C

■ Thick-Film Normal Type Chip Resistors



FEATURES

- Low resistance and high precision (1%).
- Excellent reliability and suitable cost.
- Suitable for lead free soldering.
- RoHS compliant & Halogen Free.

APPLICATION

- Consumer electronics, M/B.
- Battery pack, BTC.
- Notebook, Tablet PC.
- Portable Device, Electronic Equipment.

PART NUMBER

FCF	06	F	T	-	R100	-	E
Type □□□	Size □□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR □	Special Code □
FCF Thick Film Normal Low ohm	**03** 0603 **05** 0805 **06** 1206 **12** 1210 **20** 2010 **25** 2512	**F** =±1% **J** =±5%	**T** =Paper tape – 5 Kpcs **V** =Paper tape – 10 Kpcs **W** =Paper tape – 20 Kpcs **P** =Plastic tape – 4 Kpcs **X** =Plastic tape – 8 Kpcs **Y** =Plastic tape – 16Kpcs	**"–"** Standard	**XXXX** 4 digits	**"–"** Standard	**E:** Standard Low R

RATING

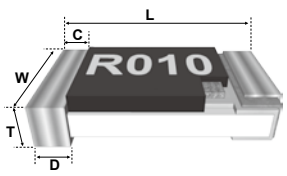
Type		Normal Type Power Rating @ 70℃	Max. RCWV (mV)	Max. Overload Voltage (mV)	Resistance Tolerance (%)	Temperauture Coefficient of Resistance (TCR ; ppm/℃)	Resistance Range (mΩ)		Standard Resistance Values
							Min.	Max.	
FCF03	**0603**	1/8W	337	754	±1%, ±5%	±200	100	910	E-24
						±400	50	91	
FCF05	**0805**	1/4W	477	1067	±1%, ±5%	±200	100	910	
						±400	50	91	
FCF06	**1206**	1/3W	551	1232	±1%, ±5%	±200	100	910	
						±400	50	91	
FCF12	**1210**	2/3W	779	1742	±1%, ±5%	±200	100	910	
						±400	50	91	
FCF20	**2010**	3/4W	826	1847	±1%, ±5%	±200	100	910	
						±400	50	91	
FCF25	**2512**	1W	954	2133	±1%, ±5%	±200	100	910	
						±400	50	91	

Note :
(1) RCWV = $(P \times R)^{1/2}$ or Max. RCWV listed above, whichever is lower.
RCWV：Rated Continue Working Voltage(V)，P：Rated Power(W)，R：Resistance Value(Ω)
(2) Special resistance value request please contact factory.

GUIDE OF CURRENT SENSING RESISTORS

Series	Product Type	Resistance Range (<1Ω)	Power Type	AEC Q200
FMF	Metal Strip	0mΩ~220mΩ	V	V
FOF	Metal Foil	2mΩ~700mΩ	V	
FBF	Metal Type	10mΩ~910mΩ	V	
FPF	High Power	50mΩ~910mΩ	V	V
FCF-E	**Normal**	**50mΩ~910mΩ**		

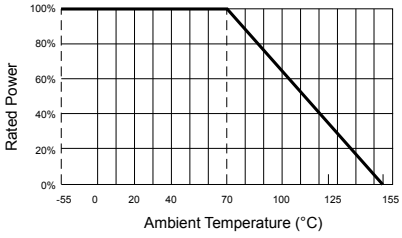
DIMENSIONS



unit: mm

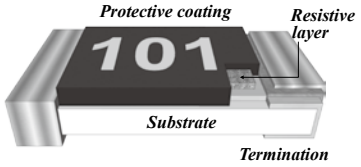
Type	L	W	C	D	T
FCF03	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
FCF05	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
FCF06	3.10±0.10	1.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
FCF12	3.10±0.10	2.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
FCF20	5.00±0.20	2.50±0.20	0.60±0.25	0.60±0.25	0.60±0.10
FCF25	6.30±0.20	3.10±0.20	0.60±0.25	0.90±0.25	0.60±0.15

POWER DE-RATING CURVE



FPF

■ High Rated Power Thick-film Lead Free Chip Resistors



FEATURES

- High power rating to 3W and compact size.
- High reliability and high precision (1%).
- Suitable for lead free soldering.
- Meet AEC-Q200, RoHS compliant & Halogen Free.

APPLICATION

- Power supply.
- Automotive industry.
- Digital meter, Consumer electronics, M/B.
- LED Lighting.
- Industry control board.

PART NUMBER

FPF	06	J	T	G	1R0_	L	
Type □□□	Size □□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR	Special Code
FPF High Power Resistors	**03** 0603 **05** 0805 **06** 1206 **12** 1210 **20** 2010 **25** 2512	**F** =±1% **J** =±5%	**T** =Paper tape – 5 Kpcs **V** =Paper tape – 10 Kpcs **W** =Paper tape – 20 Kpcs **P** =Plastic tape – 4 Kpcs **X** =Plastic tape – 8 Kpcs **Y** =Plastic tape – 16Kpcs **Q** =Plastic tape – 3 Kpcs (For Power boost 2010 / 2512)	**"–"** Standard Power boost code **E** =1/3W (0603) **F** =1/2W(0805) **G** =3/4W(1206) **I** =1.5W(2010) **K** =3W(2512)	**XXXX** **>=1R** **1%** 4 digit **5%** 3 digit ("_" means a blank)	No special code- Null special code- "–" Power boost code **N** =100ppm **Y** =150ppm **L** =200ppm	**"Null"** Standard **M:** Meet AEC-Q200

RATING

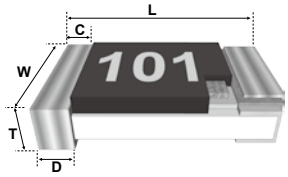
Type		Normal Type Power Rating @ 70℃	Max. RCWV	Max. Overload Voltage	Resistance Tolerance (%)	Temperauture Coefficient of Resistance (ppm/℃)	Resistance Range		Standard Resistance Values
							Min.	Max.	
FPF03	**0603**	1/8W *1/3W	50V 75V	100V 125V	±1%(F)	±100	10Ω	1MΩ	E96/E24
					±1%(F)	±200	1Ω	9.76Ω	E96/E24
					±5%(J)	±200	1Ω	1MΩ	E24
FPF05	**0805**	1/4W *1/2W	150V 200V	300V 300V	±1%(F)	±100	10Ω	1MΩ	E96/E24
					±1%(F)	±150	1Ω	9.76Ω	E96/E24
					±5%(J)	±200	1Ω	1MΩ	E24
FPF06	**1206**	1/2W *3/4W	200V 250V	400V 500V	±1%(F)	±100	1Ω	1MΩ	E96/E24
					±5%(J)	±200	1Ω	1MΩ	E24
FPF12	**1210**	1/2W *3/4W	200V 250V	400V 500V	±1%(F)	±100	1Ω	1MΩ	E96/E24
					±5%(J)	±200	1Ω	1MΩ	E24
FPF20	**2010**	1W *1.5W	200V 250V	400V 500V	±1%(F)	±100	1Ω	1MΩ	E96/E24
					±5%(J)	±200	1Ω	1MΩ	E24
FPF25	**2512**	2W *3W	300V	600V	±1%(F)	±100	1Ω	1MΩ	E96/E24
					±5%(J)	±200	1Ω	1MΩ	E24

Type		Description	Max. Rated Current	Resistance Range
FPF03	**0603**	Zero Ohm Jumper	≦ 2A	< 20mΩ
FPF05/06/12	**0805-1210**	Zero Ohm Jumper	≦ 4A	< 20mΩ
FPF20/25	**2010-2512**	Zero Ohm Jumper	≦ 6A	< 20mΩ
FPF25 3W	**2512**	Zero Ohm Jumper	≦ 12A	< 20mΩ

Note :
(1) RCWV = $(P \times R)^{1/2}$ or Max. RCWV listed above, whichever is lower.
RCWV：Working Voltage (V)，P：Rated Power (W)，R：Resistance Value (Ω)
(2) Above 2512 size, solder-pad and trace size should be >300 mm^2 and board surface temperature should not exceed 105℃ when applying full rated power.
(3) 2512 Solder-pad and trace size should be >300 mm^2 and board surface temperature should not exceed 105℃ when applying full rated power.

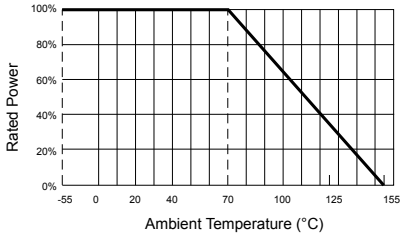
DIMENSIONS

unit: mm



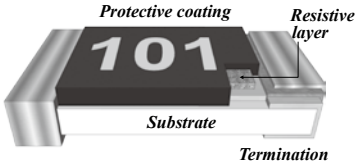
Type	L	W	C	D	T
FPF03	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
FPF05	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
FPF06	3.10±0.10	1.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
FPF12	3.10±0.10	2.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
FPF20	5.00±0.20	2.50±0.20	0.65±0.25	0.60±0.25	0.60±0.10
FPF25	6.40±0.20	3.10±0.20	0.60±0.25	1.80±0.25	0.60±0.15
FPF25 3W	6.40±0.20	3.10±0.20	0.45±0.25	1.80±0.25	1.10±0.20

POWER DE-RATING CURVE



Operating Temperature Range: -55 to +155 deg.C

■ Thick Film High Power & Anti-Surge Chip Resistors



FEATURES

- High reliability and high precision (1%).
- Suitable for withstanding surge voltage.
- Suitable for lead free soldering.
- Meet AEC-Q200, RoHS compliant & Halogen Free.

APPLICATION

- Power supply.
- Automotive industry.
- Digital meter, Consumer electronics, M/B.
- LED Lighting.
- Industry control board.

PART NUMBER

FPS	08	F	T	F	1004	N	M
Type	Size	Tolerance	Packing	Watt	R Value	TCR	Special Code
□□□	□□	□	□	□	□□□□		
FPS Thick Film High Power & Anti-Surge	**03** 0603 **05** 0805 **06** 1206 **12** 1210 **20** 2010 **25** 2512	**F** =±1% **J** =±5%	**T** =Paper tape – 5 Kpcs **V** =Paper tape – 10 Kpcs **W** =Paper tape – 20 Kpcs **P** =Plastic tape – 4 Kpcs **X** =Plastic tape – 8Kpcs **Y** =Plastic tape – 16Kpcs	**"–"** Standard Power boost code **E** =1/3W (0603) **F** =1/2W(0805) **G** =3/4W(1206)	**XXXX** **>=1R** **1%** 4 digit **5%** 3 digit ("_" means a blank)	No special code- Null special code- "–" Power boost code **N** =100ppm **Y** =150ppm **L** =200ppm	**"Null"** Standard **M:** Meet AEC-Q200

RATING

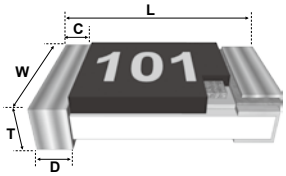
Type		Normal Type Power Rating @ 70℃	Max. RCWV	Max. Overload Voltage	Resistance Tolerance (%)	Temperauture Coefficient of Resistance (ppm/℃)	Resistance Range		Standard Resistance Values
							Min.	Max.	
FPS03	**0603**	1/8W *1/3W	50V 75V	100V 125V	±1%(F)	±100	10Ω	1MΩ	E96/E24
					±1%(F)	±200	1Ω	9.76Ω	E96/E24
					±5%(J)	±200	1Ω	1MΩ	E24
FPS05	**0805**	1/4W *1/2W	150V 200V	300V 300V	±1%(F)	±100	10Ω	1MΩ	E96/E24
					±1%(F)	±150	1Ω	9.76Ω	E96/E24
					±5%(J)	±200	1Ω	1MΩ	E24
FPS06	**1206**	1/2W *3/4W	200V 250V	400V 500V	±1%(F)	±100	1Ω	1MΩ	E96/E24
					±5%(J)	±200	1Ω	1MΩ	E24
FPS12	**1210**	1/2W	200V	400V	±1%(F)	±100	1Ω	1MΩ	E96/E24
					±5%(J)	±200	1Ω	1MΩ	E24
FPS20	**2010**	1W	200V	400V	±1%(F)	±100	1Ω	1MΩ	E96/E24
					±5%(J)	±200	1Ω	1MΩ	E24
FPS25	**2512**	2W	300V	600V	±1%(F)	±100	1Ω	1MΩ	E96/E24
					±5%(J)	±200	1Ω	1MΩ	E24

Type		Description	Max. Rated Current	Resistance Range
FPS03	**0603**	Zero Ohm，Jumper	≦ 2A	< 20mΩ
FPS05	**0805**	Zero Ohm，Jumper	≦ 4A	< 20mΩ
FPS06	**1206**	Zero Ohm，Jumper	≦ 4A	< 20mΩ
FPS12	**1210**	Zero Ohm，Jumper	≦ 4A	< 20mΩ
FPS20	**2010**	Zero Ohm，Jumper	≦ 6A	< 20mΩ
FPS25	**2512**	Zero Ohm，Jumper	≦ 6A	< 20mΩ

Note :
(1) 2512 2W loading with total solder-pad and trace size of 300 mm^2
(2) RCWV = $(P \times R)^{1/2}$ or Max. RCWV listed above, whichever is lower. (RCWV：Rated Continue Working Voltage(V)，P：Rated Power(W)，R：Resistance Value(Ω))
(3) Solder-pad and trace size should be evaluated and board surface temperature should not.
(4) Exceed 105℃ when applied full rated power.

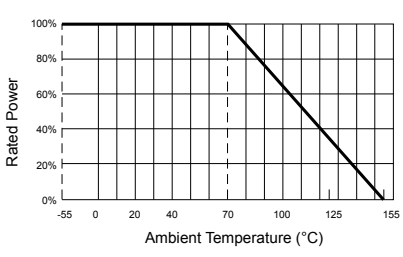
DIMENSIONS

unit: mm

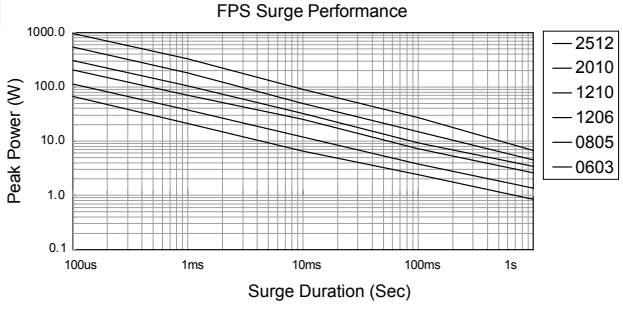


Size	L	W	C	D	T
0603	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
0805	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
1206	3.10±0.10	1.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
1210	3.10±0.10	2.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
2010	5.00±0.20	2.50±0.20	0.65±0.25	0.60±0.25	0.60±0.10
2512	6.40±0.20	3.10±0.20	0.60±0.25	1.80±0.25	0.60±0.15

POWER DE-RATING CURVE

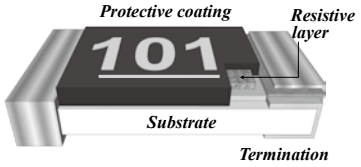


SURGE PERFORMANCE



FNF

■ Anti-Surge Lead Free & Halogen Free Chip Resistors



FEATURES

- High reliability and compact size.
- Suitable for withstanding surge voltage.
- Suitable for lead free soldering.
- RoHS compliant & Halogen Free.
- Meet AEC-Q200

APPLICATION

- Power supply.
- Automotive industry.
- Digital meter, Consumer electronics, M/B.
- LED Lighting.
- Industry control board.

PART NUMBER

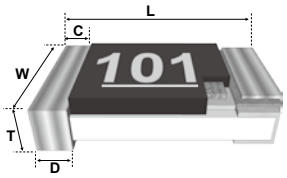
FNF	25	J	P	-	103_	-	M
Type □□□	Size □□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR	Special Code
FNF Thick Film Anti-Surge	**03** 0603 **05** 0805 **06** 1206 **12** 1210 **20** 2010 **25** 2512	**J** =±5% **K** =±10% **L** =± 15% **M** =± 20%	**T** =Paper tape – 5 Kpcs **V** =Paper tape – 10 Kpcs **W** =Paper tape – 20 Kpcs **P** =Plastic tape – 4 Kpcs **X** =Plastic tape – 8 Kpcs **Y** =Plastic tape – 16Kpcs	**"–"** Standard	**XXXX** **>=1R** **1%** 4 digit **5%** 3 digit ("_" means a blank)	No special code- Null special code- "–"	**"Null"** Standard **M:** Meet AEC-Q200

RATING

Type		Normal Type Power Rating @ 70℃	Max. RCWV	Max. Overload Voltage	Resistance Tolerance (%)	Temperauture Coefficient of Resistance (ppm/℃)	Resistance Range		Standard Resistance Values
							Min.	Max.	
FNF03	**0603**	1/10W	50V	100V	±5%(J) ±10%(K) ±15%(L) ±20%(M)	±100	1Ω	1MΩ	E-24
FNF05	**0805**	1/8W	150V	300V					
FNF06	**1206**	1/4W	200V	400V					
FNF12	**1210**	1/3W	200V	400V					
FNF20	**2010**	3/4W	200V	400V					
FNF25	**2512**	1W	200V	400V					

Note :
• RCWV = $(P \times R)^{1/2}$ or Max. RCWV listed above, whichever is lower. (RCWV：Rated Continue Working Voltage(V)，P：Rated Power(W)，R：Resistance Value(Ω))

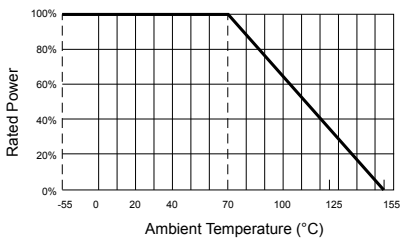
DIMENSIONS



unit: mm

Size	L	W	C	D	T
0603	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
0805	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
1206	3.10±0.10	1.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
1210	3.10±0.10	2.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
2010	5.00±0.20	2.50±0.20	0.60±0.25	0.60±0.25	0.60±0.10
2512	6.40±0.20	3.20±0.20	0.60±0.25	0.90±0.25	0.60±0.15

POWER DE-RATING CURVE

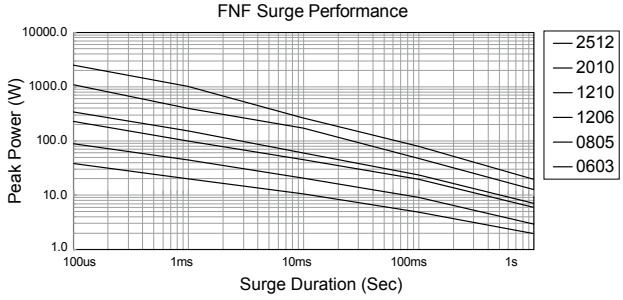


MARKING/SOLDERING

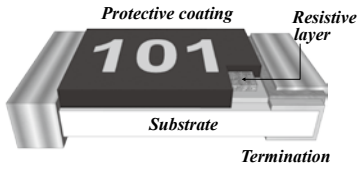
Resistance value identify
E24 ±5%：3 Digits marking with underline to identify the resistance value
0603/0805/1206/1210/2010/2512

301 → $30 \times 10^{1} = 300\Omega$

SURGE PERFORMANCE



■ High Ohmic Lead Free Chip Resistors



FEATURES

- Small size and light weight with size range per int'l standard.
- Highly stable in auto-placement surface mounting application.
- Compatible with flow and reflow soldering.
- RoHS compliant & Halogen Free.

APPLICATION

- Medical equipment.
- Printer.
- Automotive industry.
- Converter.
- Power supply in small size.

PART NUMBER

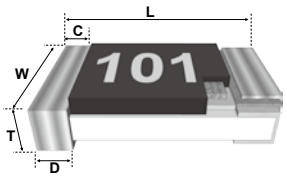
FHF	12	J	T	-	104_		
Type □□□	Size □□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR	Special Code
FHF Thick Film High Ohmic	**02** 0402 **03** 0603 **05** 0805 **06** 1206	**F** =±1% **J** =±5%	**T** =Paper tape – 5 Kpcs **V** =Paper tape – 10 Kpcs **W** =Paper tape – 20 Kpcs	**"–"** Standard	**XXXX** **>=1R** **1%** 4 digit **5%** 3 digit ("_" means a blank)	No special code- Null special code- "–"	**"Null"** Standard

RATING

Type		Normal Type Power Rating @ 70℃	Max. RCWV	Max. Overload Voltage	Resistance Tolerance (%)	Temperauture Coefficient of Resistance (TCR ; ppm/℃)	Resistance Range		Standard Resistance Values
							Min.	Max.	
FHF02	**0402**	1/16W	50V	100V	±1%(F)	±300	11MΩ	30MΩ	E-24
					±5%(J)	±300	11MΩ	30MΩ	
FHF03	**0603**	1/10W	50V	100V	±1%(F)	±200	11MΩ	22MΩ	E-12
					±5%(J)	±200	11MΩ	100MΩ	
FHF05	**0805**	1/8W	150V	300V	±1%(F)	±200	11MΩ	22MΩ	
					±5%(J)	±200	11MΩ	100MΩ	
FHF06	**1206**	1/4W	200V	400V	±1%(F)	±200	11MΩ	22MΩ	
					±5%(J)	±200	11MΩ	100MΩ	

Note :
(1) RCWV = $(P \times R)^{1/2}$ or Max. RCWV listed above, whichever is lower.
RCWV：Rated Continue Working Voltage(V)，P：Rated Power(W)，R：Resistance Value(Ω)

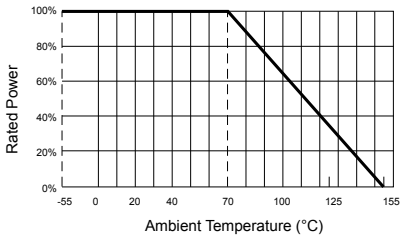
DIMENSIONS



unit: mm

Type 1	L	W	C	D	T
FHF02	1.00±0.05	0.50±0.05	0.20±0.10	0.25±0.10	0.35±0.05
FHF03	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
FHF05	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
FHF06	3.10±0.10	1.60±0.10	0.50±0.20	0.50±0.25	0.55±0.10

POWER DE-RATING CURVE



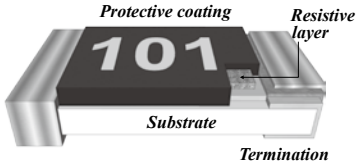
MARKING/SOLDERING

Each resistor is marked with a three digits code on the protective coating to designate the nominal resistance value.

3 digit marking for ±1% ±5%
examples :
306 = 30MΩ
476 = 47MΩ

FGF

■ Non-Magnetic Lead Free Chip Resistors



FEATURES

- Non-Magnetic chip resistors by copper plating on middle termination.
- Non-Magnetic chip resistors pass 3000 gauss magnetic detection.
- Compatible with flow and reflow soldering.
- Suitable for lead free soldering.
- Meet RoHS compliant.
- RoHS compliant & Halogen Free.

APPLICATION

- Medical equipment.
- Automotive industry.
- MRI industry.
- Measurement instrument.

PART NUMBER

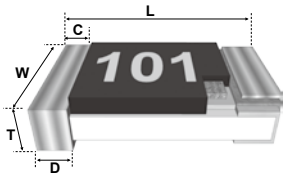
FGF	05	F	T	-	1002		
Type □□□	Size □□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR	Special Code
FGF Thick Film Non-Magnetic	**03** 0603 **05** 0805 **06** 1206	**F** =±1% **J** =±5%	**T** =Paper tape – 5 Kpcs **V** =Paper tape – 10 Kpcs **W** =Paper tape – 20 Kpcs	**"–"** Standard	**XXXX** **>=1R** **1%** 4 digit **5%** 3 digit ("_" means a blank)	No special code- Null special code- "–"	**"Null"** Standard

RATING

Type		Normal Type Power Rating @ 70℃	Max. RCWV	Max. Overload Voltage	Resistance Tolerance (%)	Temperauture Coefficient of Resistance (TCR ; ppm/℃)	Resistance Range		Standard Resistance Values
							Min.	Max.	
FGF03	**0603**	1/10W	50V	100V	±1%(F)	±100	1Ω	10MΩ	E-96
					±5%(J)	±200	0Ω&1Ω	10MΩ	E-24
FGF05	**0805**	1/8W	150V	300V	±1%(F)	±100	1Ω	10MΩ	E-96
					±5%(J)	±200	0Ω&1Ω	10MΩ	E-24
FGF06	**1206**	1/4W	200V	400V	±1%(F)	±100	1Ω	10MΩ	E-96
					±5%(J)	±200	0Ω&1Ω	10MΩ	E-24

Jumper :
• 0603 size maximum resistance R_{max} < 50mΩ and rated current I_R ≦ 1A
• 0805, 1206 size maximum resistance R_{max} < 50mΩ and rated current I_R ≦ 2A
Note :
(1) RCWV = $(P \times R)^{1/2}$ or Max. RCWV listed above, whichever is lower.
RCWV：Rated Continue Working Voltage(V)，P：Rated Power(W)，R：Resistance Value(Ω)
(2) 1Ω~10Ω: Temperature Coefficient of Resistance for 0603, 0805, 1206 = -300 ~ +500

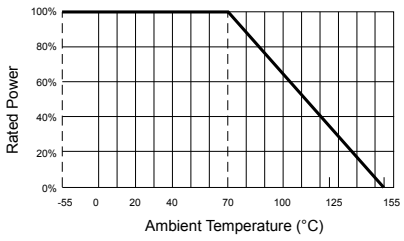
DIMENSIONS



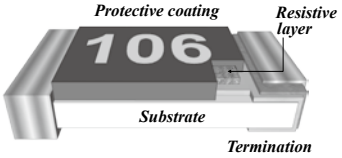
unit: mm

Type	L	W	C	D	T
FGF03	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
FGF05	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
FGF06	3.10±0.10	1.60±0.10	0.50±0.20	0.50±0.25	0.55±0.10

POWER DE-RATING CURVE



■ Safety Certified Thick-Film Type High-Voltage Lead Free Chip Resistors



FEATURES

- Special materials and design for higher working
- voltage required.
- Compatible with flow and reflow soldering.
- Suitable for lead free soldering.
- Voltage coefficient resistance 100ppm, Max. below 300ppm.
- Meet AEC-Q200, RoHS compliant & Halogen Free.
- Safety resistor certificate meet
  … UL/IEC 62368 Resistors requirements certificated.
  … UL/IEC 60950-1 certificated.
  … UL/IEC 60065., UL1676 qualified.

APPLICATION

- Power supply.
- Automotive industry.
- Measurement instrument.
- Medical equipment.

PART NUMBER

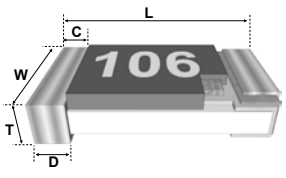
FVS	25	F	P	-	1004	-	M
Type □□□	Size □□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR	Special Code
FVS Thick Film High Voltage UL Safety Certification	**03** 0603 **05** 0805 **06** 1206 **20** 2010 **25** 2512	**F** =±1% **J** =±5%	**T** =Paper tape – 5 Kpcs **V** =Paper tape – 10 Kpcs **W** =Paper tape – 20 Kpcs **P** =Plastic tape – 4 Kpcs **X** =Plastic tape – 8Kpcs **Y** =Plastic tape – 16Kpcs	**"–"** Standard	**XXXX** **>=1R** **1%** 4 digit **5%** 3 digit ("_" means a blank)	No special code- Null special code- "–"	**"Null"** Standard **M:** Meet AEC-Q200

RATING

Type		Normal Type Power Rating @ 70℃	Max. RCWV	Max. Overload Voltage	Resistance Tolerance (%)	Temperauture Coefficient of Resistance (ppm/℃)	Resistance Range		Standard Resistance Values
							Min.	Max.	
FVS03	**0603**	1/10W	200V	400V	±1%(F)	±100	100KΩ	10MΩ	E96/E24
					±5%(J)	±200	100KΩ	22MΩ	E24
FVS05	**0805**	1/8W	400V	800V	±1%(F)	±100	100KΩ	10MΩ	E96/E24
					±5%(J)	±200	100KΩ	22MΩ	E24
FVS06	**1206**	1/4W	800V	1600V	±1%(F)	±100	100KΩ	10MΩ	E96/E24
					±1%(F)	±200	11MΩ	22MΩ	E24
					±5%(J)	±200	100KΩ	100MΩ	E24
FVS20	**2010**	1/2W	2000V	3000V	±1%(F)	±100	100KΩ	10MΩ	E96/E24
					±1%(F)	±200	11MΩ	22MΩ	E24
					±5%(J)	±200	100KΩ	100MΩ	E24
FVS25	**2512**	1W	3000V	4000V	±1%(F)	±100	100KΩ	10MΩ	E96/E24
					±1%(F)	±200	11MΩ	22MΩ	E24
					±5%(J)	±200	100KΩ	100MΩ	E24

Note :
(1) RCWV = $(P \times R)^{1/2}$ or Max. RCWV listed above, whichever is lower.
RCWV：Rated Continue Working Voltage(V)，P：Rated Power(W)，R：Resistance Value(Ω)

DIMENSIONS

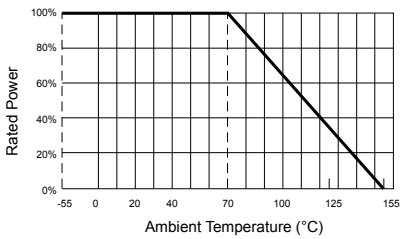


unit: mm

Type	L	W	C	D	T
FVS03	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
FVS05	2.00±0.10	1.25±0.10	0.35±0.20	0.40±0.20	0.50±0.10
FVS06	3.10±0.10	1.60±0.10	0.45±0.20	0.50±0.20	0.55±0.10
FVS20	5.00±0.20	2.50±0.20	0.60±0.25	0.60±0.25	0.60±0.10
FVS25	6.40±0.20	3.20±0.20	0.60±0.25	0.90±0.25	0.60±0.15

Resistance value identify：
Top side color is "Red" for identify high voltage product.

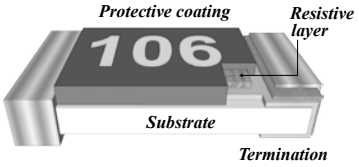
POWER DE-RATING CURVE



Operating Temperature Range: -55 to +155 deg.C

FVF

■ Thick-Film Type High-Voltage Lead Free Chip Resistors



FEATURES

- Special materials and design for higher working voltage required.
- Compatible with flow and reflow soldering.
- Suitable for lead free soldering.
- Max. Voltage coefficient resistance below 300ppm.
- Meet AEC-Q200, RoHS compliant & Halogen Free.

APPLICATION

- Power supply.
- Automotive industry.
- Measurement instrument.
- Medical equipment.

PART NUMBER

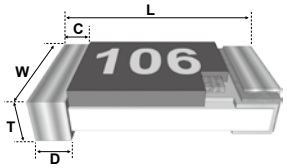
FVF	25	F	P	-	1004	-	M
Type □□□	Size □□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR	Special Code
FVF Thick Film High Voltage	**03** 0603 **05** 0805 **06** 1206 **20** 2010 **25** 2512	**F** =±1% **J** =±5%	**T** =Paper tape – 5 Kpcs **V** =Paper tape – 10 Kpcs **W** =Paper tape – 20 Kpcs **P** =Plastic tape – 4 Kpcs **X** =Plastic tape – 8Kpcs **Y** =Plastic tape – 16Kpcs	**"–"** Standard	**XXXX** **>=1R** **1%** 4 digit **5%** 3 digit ("_" means a blank)	No special code- Null special code- "–"	**"Null"** Standard **M:** Meet AEC-Q200

RATING

Type		Normal Type Power Rating @ 70℃	Max. RCWV	Max. Overload Voltage	Resistance Tolerance (%)	Temperauture Coefficient of Resistance (ppm/℃)	Resistance Range		Standard Resistance Values
							Min.	Max.	
FVF03	**0603**	1/10W	200V	400V	±1%(F)	±100	100KΩ	10MΩ	E96/E24
					±5%(J)	±200	100KΩ	22MΩ	E24
FVF05	**0805**	1/8W	400V	800V	±1%(F)	±100	100KΩ	10MΩ	E96/E24
					±5%(J)	±200	100KΩ	22MΩ	E24
FVF06	**1206**	1/4W	800V	1600V	±1%(F)	±100	100KΩ	10MΩ	E96/E24
					±1%(F)	±200	11MΩ	22MΩ	E24
					±5%(J)	±200	100KΩ	100MΩ	E24
FVF20	**2010**	1/2W	2000V	3000V	±1%(F)	±100	100KΩ	10MΩ	E96/E24
					±1%(F)	±200	11MΩ	22MΩ	E24
					±5%(J)	±200	100KΩ	100MΩ	E24
FVF25	**2512**	1W	3000V	4000V	±1%(F)	±100	100KΩ	10MΩ	E96/E24
					±1%(F)	±200	11MΩ	22MΩ	E24
					±5%(J)	±200	100KΩ	100MΩ	E24

Note :
(1) RCWV = $(P \times R)^{1/2}$ or Max. RCWV listed above, whichever is lower.
RCWV：Rated Continue Working Voltage(V)，P：Rated Power(W)，R：Resistance Value(Ω)

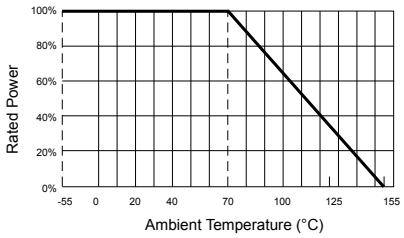
DIMENSIONS



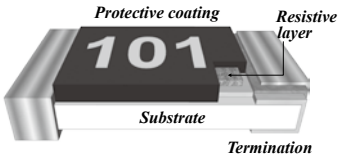
unit: mm

Type	L	W	C	D	T
FVF03	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
FVF05	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
FVF06	3.10±0.10	1.60±0.10	0.50±0.20	0.50±0.20	0.55±0.10
FVF20	5.00±0.20	2.50±0.20	0.65±0.25	0.60±0.25	0.60±0.10
FVF25	6.40±0.20	3.20±0.20	0.65±0.25	0.90±0.25	0.60±0.15

POWER DE-RATING CURVE



■ Thick Film Lead Free Chip Resistors



FEATURES

- Meet AEC-Q200 test for Automotive industry.
- Suitable for lead free soldering.
- Compatible with wave and reflow soldering.
- Anti-sulfurate products.
- RoHS compliant & Halogen Free.

APPLICATION

- Automotive industry.
- Digital meter, Consumer electronics, M/B.
- Portable electronic devices

PART NUMBER

FWF	03	F	T	-	1004	-	W
Type □□□	Size □□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR	Special Code
FWF Thick Film Automotive	**02** 0402 **03** 0603 **05** 0805 **06** 1206 **12** 1210 **20** 2010 **25** 2512	**F** =±1% **J** =±5%	**T** =Paper tape – 5 Kpcs **V** =Paper tape – 10 Kpcs **W** =Paper tape – 20 Kpcs **P** =Plastic tape – 4 Kpcs **X** =Plastic tape – 8Kpcs **Y** =Plastic tape – 16Kpcs	**"–"** Standard	**XXXX** **>=1R** **1%** 4 digit **5%** 3 digit ("_" means a blank)	No special code- Null special code- "–"	**"Null"** Standard **W:** Anti-sulfur H2S 1000ppm **S:** Safety concern application

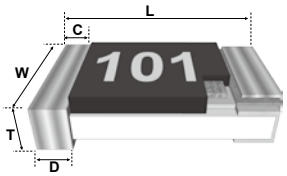
RATING

Type		Normal Type Power Rating @ 70℃	Max. RCWV	Max. Overload Voltage	Resistance Tolerance (%)	Temperauture Coefficient of Resistance (TCR ; ppm/℃)	Resistance Range Min.	Resistance Range Max.	Standard Resistance Values
FWF02	**0402**	1/16W	50V	100V	±1(F) ±5(J)	±200	> 1MΩ	10MΩ	±1%(F)：E-96/E-24 ±5%(J)：E-24
						±100	> 10Ω	1MΩ	
						-200~+400	0 & 1Ω	10Ω	
FWF03	**0603**	1/10W	75V	150V	±1(F) ±5(J)	±200	> 1MΩ	10MΩ	
						±100	> 10Ω	1MΩ	
						-200~+400	0 & 1Ω	10Ω	
FWF05	**0805**	1/8W	150V	300V	±1(F) ±5(J)	±200	> 1MΩ	10MΩ	
						±100	> 10Ω	1MΩ	
						-200~+400	0 & 1Ω	10Ω	
FWF06	**1206**	1/4W	200V	400V	±1(F) ±5(J)	±200	> 1MΩ	10MΩ	
						±100	> 10Ω	1MΩ	
						-200~+400	0 & 1Ω	10Ω	
FWF12	**1210**	1/2W	200V	400V	±1(F) ±5(J)	±200	> 1MΩ	10MΩ	
						±100	> 10Ω	1MΩ	
						-200~+400	0 & 1Ω	10Ω	
FWF20	**2010**	1/2W	200V	400V	±1(F) ±5(J)	±200	> 1MΩ	10MΩ	
						±100	> 10Ω	1MΩ	
						±200	0 & 1Ω	10Ω	
FWF25	**2512**	1W	250V	500V	±1(F) ±5(J)	±200	> 1MΩ	10MΩ	
						±100	> 10Ω	1MΩ	
						±200	0 & 1Ω	10Ω	

Type		Description	Max. Rated Current	Resistance Range
FWF02	**0402**	Zero Ohm，Jumper	≦ 1A	< 50mΩ
FWF03	**0603**	Zero Ohm，Jumper	≦ 1A	< 50mΩ
FWF05	**0805**	Zero Ohm，Jumper	≦ 2A	< 50mΩ
FWF06	**1206**	Zero Ohm，Jumper	≦ 2A	< 50mΩ
FWF12	**1210**	Zero Ohm，Jumper	≦ 3A	< 50mΩ
FWF20	**2010**	Zero Ohm，Jumper	≦ 3A	< 50mΩ
FWF25	**2512**	Zero Ohm，Jumper	≦ 3A	< 50mΩ

Note :
(1) RCWV = $(P \times R)^{1/2}$ or Max. RCWV listed above, whichever is lower.
RCWV：Rated Continue Working Voltage(V)，P：Rated Power(W)，R：Resistance Value(Ω)

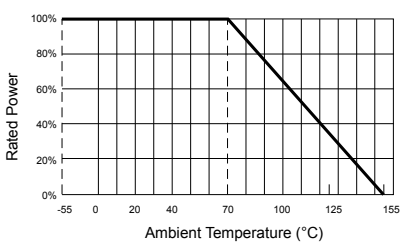
DIMENSIONS



unit: mm

Size	L	W	C	D	T
0402	1.00±0.05	0.50±0.05	0.20±0.10	0.25±0.10	0.35±0.05
0603	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
0805	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
1206	3.10±0.10	1.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
1210	3.10±0.10	2.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
2010	5.00±0.20	2.50±0.20	0.60±0.25	0.60±0.25	0.60±0.10
2512	6.40±0.20	3.20±0.20	0.60±0.25	0.90±0.25	0.60±0.15

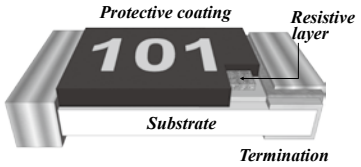
POWER DE-RATING CURVE



Operating Temperature Range: -55 to +155 deg.C

FCF

■ Thick Film Lead Free Chip Resistors



FEATURES

- Suitable for lead free soldering.
- Compatible with wave and reflow soldering.
- RoHS compliant & Halogen free.

APPLICATION

- Portable Devices.
- Measurement instrument.
- Consumer Electronics.
- Computers /Motherboard.

PART NUMBER

FCF	05	F	T	-	1002	P	
Type □□□	Size □□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR	Special Code
FCF Thick Film Normal	**0A** 01005 **01** 0201 **02** 0402 **03** 0603 **05** 0805 **06** 1206 **12** 1210 **20** 2010 **25** 2512	**B** =±0.1% **C** =±0.25% **D** =±0.5% **F** =±1% **G** =±2% **J** =±5%	**T** =Paper tape – 5 Kpcs **V** =Paper tape – 10 Kpcs **U** =Paper tape – 15Kpcs **W** =Paper tape – 20 Kpcs **P** =Plastic tape – 4 Kpcs **X** =Plastic tape – 8Kpcs **Y** =Plastic tape – 16Kpcs	**"–"** Standard	**XXXX** **>=1R** **1%** 4 digit **5%** 3 digit ("_" means a blank)	No special code- Null special code- "–" for Special TCR **Q** =25ppm **P** =50 ppm	**"Null"** Standard

RATING

Type		Power Rating at 70℃	Max. RCWV	Max. Overload Voltage	Resistance Toleranc (%)	Temperature Coefficient (TCR; ppm/℃)	Resistance Range (Ω)		Standard Resistance Values
							Min.	Max.	
FCF0A	**01005**	1/32W	15V	30V	±1%(F) ±5%(J)	±200	100	1M	±0.1%(B)：E-96/E-24 ±0.5%(D)：E-96/E-24 ±1%(F)：E-96/E-24 ±5%(J)：E-24/Jumper
						±300	10	91	
						-200 ~ +600	0 & 4.7	9.76	
FCF01	**0201**	1/20W	25V	50V	±1%(F) ±5%(J)	±200	10	10M	
						-200 ~ +600	0 & 1	9.76	
FCF02	**0402**	1/16W	50V	100V	±0.1%(B) ±0.5%(D)	±100	10	1M	
					±1%(F)	±100	10.2	10M	
						-200 ~ +400	1	10	
					±5%(J)	±200	10.2	10M	
						-200 ~ +400	0 & 1	10	
FCF03	**0603**	1/10W	75V	100V	±0.1%(B) ±0.5%(D)	±100	10	1M	
					±1%(F)	±100	10.2	10M	
						-200 ~ +400	1	10	
					±5%(J)	±200	10.2	10M	
						-200 ~ +400	0 & 1	10	
FCF05	**0805**	1/8W	150V	300V	±0.1%(B) ±0.5%(D)	±100	10	1M	
					±1%(F)	±100	10.2	10M	
						-200 ~ +400	1	10	
					±5%(J)	±200	10.2	10M	
						-200 ~ +400	0 & 1	10	
FCF06	**1206**	1/4W	200V	400V	±0.1%(B) ±0.5%(D)	±100	10	1M	
					±1%(F)	±100	10.2	10M	
						-200 ~ +400	1	10	
					±5%(J)	±200	10.2	10M	
						-200 ~ +400	0 & 1	10	
FCF12	**1210**	1/3W	200V	400V	±1%(F)	±100	10.2	10M	
						±200	1	10	
					±5%(J)	±200	0 & 1	10M	
FCF20	**2010**	3/4W	200V	400V	±1%(F)	±100	10.2	10M	
						±200	1	10	
					±5%(J)	±200	0 & 1	10M	
FCF25	**2512**	1W	250V	500V	±1%(F)	±100	10.2	10M	
						±200	1	10	
					±5%(J)	±200	0 & 1	10M	

Jumper :
- 01005 size maximum resistance R_{max} < 50m and rated current I_R ≦ 0.8A
- 0201, 0402, 0603 size maximum resistance R_{max} < 50m and rated current I_R ≦ 1A
- 0805, 1206, 1210, 2010, 2512 size maximum resistance R_{max} < 50m and rated current I_R ≦ 2A

Note :
(1) RCWV = $(P \times R)^{1/2}$ or Max. RCWV listed above, whichever is lower.
RCWV：Rated Continue Working Voltage(V)，P：Rated Power(W)，R：Resistance Value(Ω)

■ Thick Film Lead Free Chip Resistors

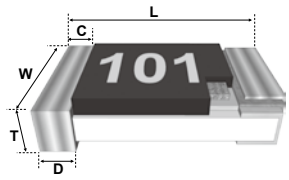
RATING

Special TCR High Precision Type

Type		Normal Type Power Rating @ 70℃	Max. RCWV	Max. Overload Voltage	Resistance Tolerance (%)	Temperauture Coefficient of Resistance (ppm/℃)	Resistance Range		Standard Resistance Values
							Min.	Max.	
FCF02	**0402**	1/16W	50V	100V	±0.1%(B) ±0.25%(C) ±0.5%(D)	±50	100	1M	E-96
FCF03	**0603**	1/10W	50V	100V		±25	470	470K	E-96
						±50	20	510K	E-96
FCF05	**0805**	1/8W	150V	300V		±25	470	470K	E-96
						±50	20	510K	E-96
FCF06	**1206**	1/4W	200V	400V		±25	470	470K	E-96
						±50	20	510K	E-96

Note :
(1) RCWV = $(P \times R)^{1/2}$ or Max. RCWV listed above, whichever is lower.
RCWV：Rated Continue Working Voltage(V)，P：Rated Power(W)，R：Resistance Value(Ω)

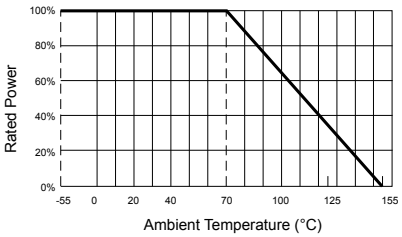
DIMENSIONS



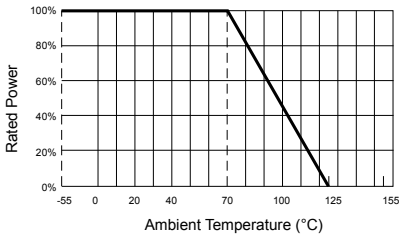
unit: mm

Size	L	W	C	D	T
01005	0.40±0.02	0.20±0.02	0.08±0.03	0.10±0.03	0.13±0.02
0201	0.60±0.03	0.30±0.03	0.10±0.05	0.15±0.05	0.23±0.03
0402	1.00±0.05	0.50±0.05	0.20±0.10	0.25±0.10	0.35±0.05
0603	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
0805	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
1206	3.10±0.10	1.60±0.10	0.50±0.20	0.50±0.25	0.55±0.10
1210	3.10±0.10	2.60±0.15	0.50±0.25	0.50±0.25	0.55±0.10
2010	5.00±0.20	2.50±0.20	0.60±0.25	0.60±0.25	0.60±0.10
2512	6.40±0.20	3.20±0.20	0.60±0.25	0.90±0.25	0.60±0.15

POWER DE-RATING CURVE



Maximum dissipation in percentage of rated power as a function of the ambient temperature for 0402, 0603, 0805, 1206, 1210, 2010, 2512



Maximum dissipation in percentage of rated power as a function of the ambient temperature for 0201, 01005

FCF ARRAY

■ Thick Film Lead Free Chip Resistor Networks

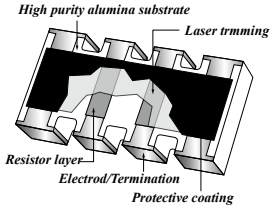


Fig 1. Consctruction of a Chip-R array (convex type)

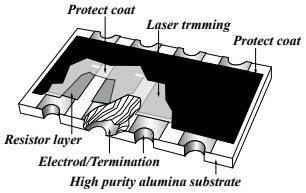


Fig 2. Consctruction of a Chip-R array (concave type)

FEATURES

- High density packaging provides higher productivity.
- Stable convex terminal reduces assembly costs.
- Compatible with flow and reflow soldering.
- RoHS compliant & Halogen Free.

APPLICATION

- Computer.
- Mobile phone.
- Camcorder.
- Portable audio.
- Battery charger.
- Hard Disk Driver.

PART NUMBER

FCF	340	J	T	-	473_		
Type □□□	Size □□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR	Special Code
FCF Thick Film Array	**240** 0402x4 (8P4R Convex) **340** 0603x4 (8P4R Convex) **220** 0402x2 (4P2R Convex) **320** 0603x2 (4P2R Convex) **370** 0602x8 (16P8R Convex) **241** 0402x4 (8P4R Concave) **341** 0603x4 (8P4R Concave) **35R** 0402x8 (10P8R Convex)	**F** =±1% **J** =±5%	**Paper tape** **T** =5Kpcs **V** =10Kpcs **W** =20Kpcs	**"–"** Standard	**XXXX** **>=1R** **1%** 4 digit **5%** 3 digit ("_" means a blank)	No special code- Null special code- "–"	**"Null"** Standard

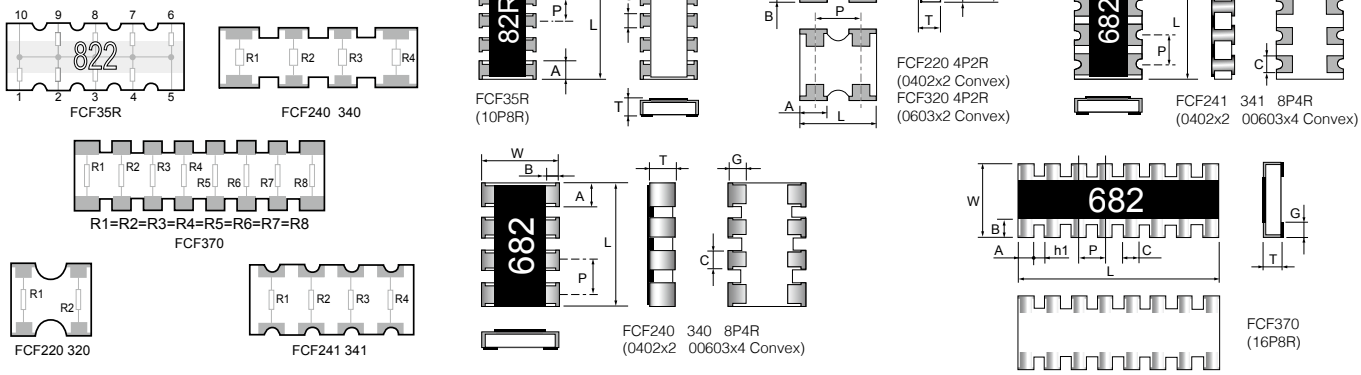
RATING

Type		Termination Construction	Normal Type Power Rating @ 70°C	Max. RCWV	Max. Overload Voltage	Resistance Tolerance (%)	Temperauture Coefficient of Resistance (TCR ; ppm/°C)	Resistance Range Min.	Resistance Range Max.	Standard Resistance Values
FCF220	**4P2R/0402x2**	Convex	1/16W	25V	50V	±5%(J)	±300	0Ω,10Ω	1MΩ	E-24
							±400	3Ω	9.1Ω	
FCF320	**4P2R/0603x2**	Convex	1/10W	50V	100V	±5%(J)	±200	0Ω,10Ω	1MΩ	
						±1%(F)	-300~+500	1Ω	9.1Ω	
FCF240	**8P4R/0402x4**	Convex	1/16W	50V	100V	±5%(J)	±200	0Ω,10Ω	1MΩ	
							-300~+500	3Ω	9.1Ω	
						±1%(F)	±200	0Ω,10Ω	1MΩ	
FCF340	**8P4R/0603x4**	Convex	1/10W	50V	100V	±5%(J)	±200	0Ω,10Ω	1MΩ	
							-300~+500	1Ω	9.1Ω	
						±1%(F)	±200	0Ω,10Ω	1MΩ	
FCF241	**8P4R/0402x4**	Concave	1/16W	25V	50V	±5%(J)	±300	0Ω,3Ω	1MΩ	
						±1%(F)				
FCF341	**8P4R/0603x4**	Concave	1/10W	50V	100V	±5%(J)	±200	0Ω,10Ω	1MΩ	
						±1%(F)				
FCF35R	**10P8R/0402x8**	Convex	1/16W	25V	50V	±5%(J)	±200	10Ω	100KΩ	
FCF370	**10P8R/0602x8**	Convex	1/16W	50V	100V	±5%(J)	±200	0Ω,10Ω	100KΩ	
						±1%(F)				

Jumper :
・Maximum resistance Rmax < 50mΩ.

Note :
(1) RCWV = $(P \times R)^{1/2}$ or Max. RCWV listed above, whichever is lower.
RCWV：Rated Continue Working Voltage(V)，P：Rated Power(W)，R：Resistance Value(Ω)

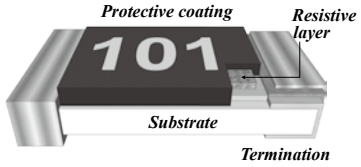
DIMENSIONS



unit: mm

Type	L	W	T	B	G	P	C	A	h1
FCF220	1.00±0.10	1.00±0.10	0.35±0.10	0.20±0.15	0.25±0.17	0.65±0.10	-	0.34±0.10	-
FCF240	2.00±0.10	1.00±0.10	0.45±0.10	0.20±0.10	0.25±0.10	0.50±0.05	0.30±0.05	0.40±0.10	-
FCF241	2.00±0.10	1.00±0.10	0.45±0.10	0.20±0.15	0.25±0.10	0.50±0.05	0.25±0.05	0.25±0.05	-
FCF320	1.60±0.20	1.50±0.10	0.50±0.10	0.30±0.15	0.30±0.15	1.00±0.10	-	0.60±0.10	-
FCF340	3.20±0.20	1.60±0.10	0.50±0.10	0.30±0.20	0.30±0.20	0.80±0.10	0.45±0.10	0.60±0.15	-
FCF341	3.20 +0.20/-0.10	1.60 +0.20/-0.10	0.60±0.10	0.35±0.15	0.50±0.15	0.80±0.10	0.50±0.15	0.60±0.15	-
FCF35R	3.30±0.20	1.60±0.15	0.55±0.10	0.40±0.15	0.40±0.15	0.64±0.05	0.40±0.15	0.50±0.05	-
FCF370	4.00±0.20	1.60±0.15	0.45±0.10	0.30±0.25	0.30±0.20	0.50±0.20	0.30±0.10	0.40±0.20	0.20±0.10

■ RoHS Exemption Free (Pb≤100ppm) Thick-film Lead Free Chip Resistors



FEATURES

- Small size and light weight.
- Suitable for lead free soldering.
- Compatible with wave and reflow soldering.
- RoHS compliant & Halogen free.
- Lead content below100ppm.

APPLICATION

- Mobile phon.
- Digital meter, Consumer electronics, M/B.
- Portable electronics devices.

PART NUMBER

FCF	05	F	T	-	1001	-	G
Type □□□	Size □□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR □	Special Code □
FCF Thick Film RoHS Exemption Free	**02** 0402 **03** 0603 **05** 0805 **06** 1206 **12** 1210 **18** 1218 **20** 2010 **25** 2512	**F** =±1% **J** =±5%	**Paper tape** **T** =5Kpcs **V** =10Kpcs **W** =20Kpcs **Plastic tape** **P** = 4Kpcs **Q** =3Kpcs (For 1218)	**"–"** Standard	**XXXX** **>=1R** **1%** 4 digit **5%** 3 digit ("_" means a blank)	No special code- Null special code- "–"	**G:** Green series

RATING

Type		Normal Type Power Rating @ 70℃	Max. RCWV	Max. Overload Voltage	Resistance Tolerance (%)	Temperauture Coefficient of Resistance (TCR ; ppm/℃)	Resistance Range Min.	Resistance Range Max.	Standard Resistance Values
FCF02	**0402**	1/16W	50V	100V	±1%(F)	-300/+500	1 Ω	10 Ω	E24 E96
						±100	10.2 Ω	976 KΩ	
						±300	1 MΩ	10 MΩ	
					±5%(J)	-300/+500	1 Ω	10 Ω	E24 Jumper
						±200	11 Ω	910 KΩ	
						±300	1 MΩ	10 MΩ	
FCF03	**0603**	1/10W	50V	100V	±1%(F)	-300/+500	1 Ω	10 Ω	E24 E96
						±100	10.2 Ω	976 KΩ	
						±200	1 MΩ	10 MΩ	
					±5%(J)	-300/+500	1 Ω	10 Ω	E24 Jumper
						±200	11 Ω	910 KΩ	
						±200	1 MΩ	10 MΩ	
FCF05	**0805**	1/8W	150V	300V	±1%(F)	-300/+500	1 Ω	10 Ω	E24 E96
						±100	10.2 Ω	976 KΩ	
						±200	1 MΩ	10 MΩ	
					±5%(J)	-300/+500	1 Ω	10 Ω	E24 Jumper
						±200	11 Ω	910 KΩ	
						±200	1 MΩ	10 MΩ	
FCF06	**1206**	1/4W	200V	400V	±1%(F)	-300/+500	1 Ω	10 Ω	E24 E96
						±100	10.2 Ω	976 KΩ	
						±200	1 MΩ	10 MΩ	
					±5%(J)	-300/+500	1 Ω	10 Ω	E24 Jumper
						±200	11 Ω	910 KΩ	
						±200	1 MΩ	10 MΩ	

FCF-G

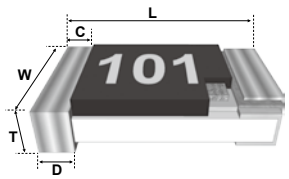
■ RoHS Exemption Free (Pb≤100ppm) Thick-film Lead Free Chip Resistors

RATING

Type		Normal Type Power Rating @ 70℃	Max. RCWV	Max. Overload Voltage	Resistance Tolerance (%)	Temperauture Coefficient of Resistance (TCR ; ppm/℃)	Resistance Range		Standard Resistance Values
							Min.	Max.	
FCF12	**1210**	1/3W	200V	400V	±1%(F)	-300/+500	1 Ω	10 Ω	E24 E96
						±100	10.2 Ω	976 KΩ	
						±200	1 MΩ	10 MΩ	
					±5%(J)	-300/+500	1 Ω	10 Ω	E24 Jumper
						±200	11 Ω	910 KΩ	
						±200	1 MΩ	10 MΩ	
FCF20	**2010**	1/2W	200V	400V	±1%(F)	±100	1 Ω	10 Ω	E24 E96
						±200	10.2 Ω	10 MΩ	
					±5%(J)	±100	1 Ω	10 Ω	E24 Jumper
						±200	11 Ω	10 MΩ	
FCF25	**2512**	1W	250V	500V	±1%(F)	±100	1 Ω	10 Ω	E24 E96
						±200	10.2 Ω	10 MΩ	
					±5%(J)	±100	1 Ω	10 Ω	E24 Jumper
						±200	11 Ω	10 MΩ	
FCF18	**1218**	1W	200V	400V	±1%(F)	±100	1 Ω	10 Ω	E24 E96
						±200	10.2 Ω	10 MΩ	
					±5%(J)	±100	1 Ω	10 Ω	E24 Jumper
						±200	11 Ω	10 MΩ	

Note :
(1) RCWV = $(P \times R)^{1/2}$ or Max. RCWV listed above, whichever is lower.
RCWV：Working Voltage (V)，P：Rated Power (W)，R：Resistance Value (Ω)
Jumper : Max. 50mΩ.

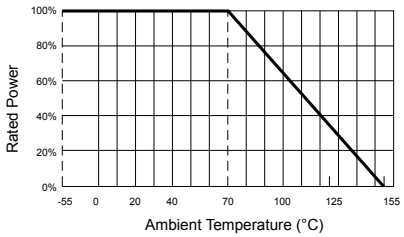
DIMENSIONS



unit: mm

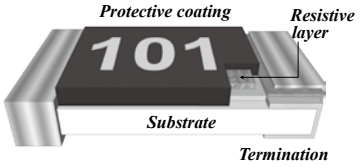
Type 1	L	W	C	D	T
FCF02	1.00±0.05	0.50±0.05	0.20±0.10	0.25±0.10	0.35±0.05
FCF03	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
FCF05	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
FCF06	3.10±0.10	1.60±0.10	0.50±0.20	0.50±0.25	0.55±0.10
FCF12	3.10±0.10	2.60±0.15	0.50±0.25	0.50±0.25	0.55±0.10
FCF20	5.00±0.20	2.50±0.20	0.65±0.25	0.60±0.25	0.55±0.10
FCF25	6.40±0.20	3.20±0.20	0.65±0.25	0.90±0.25	0.60±0.10
FCF18	3.05±0.15	4.60±0.20	0.45±0.25	0.50±0.25	0.55±0.10

POWER DE-RATING CURVE



Maximum dissipation in percentage of rated power as a function of the ambient temperature for 0402, 0603, 0805, 1206, 1210, 2010, 2512, 1218

■ Thin Film Lead Free High Precision Chip Resistors



FEATURES

- High reliability and stability of 0.3% and below per customer request.
- Metal Thin Film Ni/Cr/Si,...etc. Resistive element.
- High performance of TCR 50ppm and below per customer request.
- Low current noise.
- Meet AEC-Q200, RoHS compliant.

APPLICATION

- Automotive industry.
- Medical equipment.
- Measuring instrument.
- Portable measuring equipment.
- Communication device

PART NUMBER

FAF	05	F	T	-	1002	P	
Type □□□	Size □□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR	Special Code
FAF Thin Film	**01** 0201 **02** 0402 **03** 0603 **05** 0805 **06** 1206 **12** 1210 **20** 2010 **25** 2512	**T** =±0.01% **A** =±0.05% **B** =±0.1% **C** =±0.25% **D** =±0.5% **F** =±1%	**Paper tape** **T** =5 Kpcs **V** =10Kpcs **U** =15 Kpcs **Plastic tape** **P** =4Kpcs **X** =8Kpcs	**"–"** Standard **A** =1/16W **B** =1/10W **C** =1/8W **D** =1/4W **E** =1/3W **F** =1/2W **G** =3/4W **H** =1W **R** =2/5W **T** =1/20W	**XXXX** **>=1R** **1%** 4 digit **5%** 3 digit ("_" means a blank)	No special code- Null special code- "–" **B** =2PPM **C** =3PPM **W** =5PPM **V** =10PPM **S** =15PPM **Q** =25PPM **P** =50PPM	**"Null"** Standard **HC** =Anti-Sulfuration **M** =Meet AEC-Q200 **MF** =Anti-Sulfuration & AEC-Q200 **MH** =Tantalum nitride Anti- Sulfuration & AEC-Q200

FCF	340	J	T	-	473_		
Type □□□	Size □□□	Tolerance □	Packing □	Watt □	R Value □□□□	TCR □	Special Code
FAF Thin Film Array	**340** 0603x4 (8P4R Convex)	**B** =±0.1% **C** =±0.25% **D** =±0.5% **F** =±1%	**Paper tape** **T** =5 Kpcs **V** =10Kpcs	**"–"** Standard	**XXXX** **>=1R** **1%** 4 digit **5%** 3 digit	No special code- Null special code- "–" **Q** =25PPM **P** =50PPM	**"Null"** Standard

RATING

Standard Type - General High Precision

Standard Type	Power Rating @ 70℃	Max. RCWV (V)	Max. Overload Voltage (V)	Temperauture Coefficient of Resistance (ppm/℃)	Resistance Tolerance (%)	Resistance Range		Resistance Range Meet AEC-Q200		Standard Resistance Values
						Min.	Max.	Min.	Max.	
0201	1/32W	15	30	±25 ±50	±0.1 ±0.25 ±0.5 ±1.0	100Ω	12KΩ	NA	NA	E24 E96
0402	1/16W	50	100			10Ω	255KΩ	10Ω	100KΩ	
0603	1/16W	50	100			3.9Ω	1MΩ	4.7Ω	330KΩ	
0805	1/10W	100	200			4.7Ω	2MΩ	4.7Ω	1MΩ	
1206	1/8W	200	400			1Ω	2.49MΩ	4.7Ω	1MΩ	
1210	1/4W	200	400			4.7Ω	2.49MΩ	10Ω	1MΩ	
2010	1/2W	200	400			4.7Ω	3MΩ	10Ω	1.5MΩ	
2512	3/4W	200	400			1Ω	3MΩ	10Ω	1.5MΩ	
2512	3/4W	200	400					4.7Ω	3MΩ	

Function Type - Power High Precision

Standard Type	Power Rating @ 70℃	Max. RCWV (V)	Max. Overload Voltage (V)	Temperauture Coefficient of Resistance (ppm/℃)	Resistance Tolerance (%)	Resistance Range		Resistance Range Meet AEC-Q200		Standard Resistance Values
						Min.	Max.	Min.	Max.	
0201	1/20W	15	30	±25	±0.5 ±1.0	27Ω	12KΩ	NA	NA	E24 E96
				±50		27Ω	22.1KΩ	NA	NA	
0402	1/10W	50	100	±25 ±50	±0.1 ±0.25 ±0.5 ±1.0	10Ω	255KΩ	10Ω	100KΩ	
0603	1/10W	75	150			3.9Ω	1MΩ	4.7Ω	330KΩ	
0805	1/8W	150	300			4.7Ω	2MΩ	4.7Ω	1MΩ	
1206	1/4W	200	400			1Ω	2.5MΩ	4.7Ω	1MΩ	
1210	2/5W	200	400			4.7Ω	2.5MΩ	10Ω	1MΩ	
2010	3/4W	200	400	±50		4.7Ω	3MΩ	10Ω	1.5MΩ	
2512	1W	200	400			1Ω	3MΩ	10Ω	1.5MΩ	

■ Thin Film Lead Free High Precision Chip Resistors

RATING

Function Type - Special (±10&±15)TCR High Precision

Narrow TCR Type*	Power Rating @ 70℃	Max. RCWV (V)	Max. Overload Voltage (V)	Temperauture Coefficient of Resistance (ppm/℃)	Resistance Tolerance (%)	Resistance Range		Resistance Range Meet AEC-Q200		Standard Resistance Values
						Min.	Max.	Min.	Max.	
0402	1/10W	50	100	±10 ±15	±0.01 ±0.05 ±0.1 ±0.25 ±0.5 ±1.0	10Ω	100KΩ	10Ω	60KΩ	E24 E96
0603	1/10W	75	150			4.7Ω	200KΩ	4.7Ω	150KΩ	
0805	1/8W	150	300			4.7Ω	400KΩ	4.7Ω	400KΩ	
1206	1/4W	200	400			4.7Ω	500KΩ	4.7Ω	500KΩ	
1210	2/5W	200	400			10Ω	600KΩ	10Ω	600KΩ	
2010	3/4W	200	400			10Ω	1MΩ	10Ω	1MΩ	
2512	1W	200	400			10Ω	1.5MΩ	10Ω	1.5MΩ	

Function Type –Special TCR (±2&±3) High Precision

Narrow TCR Type*	Power Rating @ 70℃	Max. RCWV (V)	Max. Overload Voltage (V)	Temperauture Coefficient of Resistance (ppm/℃)	Resistance Tolerance (%)	Resistance Range		Resistance Range Meet AEC-Q200		Standard Resistance Values
						Min.	Max.	Min.	Max.	
0402	1/10W	50	100	±3 ±2	±0.01 ±0.05 ±0.1 ±0.25 ±0.5 ±1.0	10Ω	8KΩ	10Ω	8KΩ	E24 E96
0603	1/10W	75	150			4.7Ω	40KΩ	4.7Ω	40KΩ	
0805	1/8W	150	300			4.7Ω	80KΩ	4.7Ω	80KΩ	
1206	1/4W	200	400			4.7Ω	120KΩ	4.7Ω	120KΩ	
1210	2/5W	200	400			4.7Ω	150KΩ	10Ω	150KΩ	
2010	3/4W	200	400			4.7Ω	360KΩ	10Ω	360KΩ	
2512	1W	200	400			4.7Ω	600KΩ	10Ω	600KΩ	

Anti-Sulfuration Type- Power High Precision

Narrow TCR Type*	Power Rating @ 70℃	Max. RCWV (V)	Max. Overload Voltage (V)	Temperauture Coefficient of Resistance (ppm/℃)	Resistance Tolerance (%)	Resistance Range		Resistance Range Meet AEC-Q200		Standard Resistance Values
						Min.	Max.	Min.	Max.	
0402	1/10W	50	100	±25 ±50	±0.1 ±0.25 ±0.5 ±1.0	10Ω	255KΩ	10Ω	100KΩ	E24 E96
0603	1/10W	75	150			4.7Ω	1MΩ	4.7Ω	330KΩ	
0805	1/8W	150	300			4.7Ω	2MΩ	10Ω	1MΩ	
1206	1/4W	200	400			1Ω	2.5MΩ	10Ω	1MΩ	
1210	2/5W	200	400			4.7Ω	2.5MΩ	10Ω	1MΩ	
2010	3/4W	200	400			4.7Ω	3MΩ	10Ω	1.5MΩ	
2512	1W	200	400			1Ω	3MΩ	10Ω	1.5MΩ	

Tantalum nitride Type - Special TCR High Precision

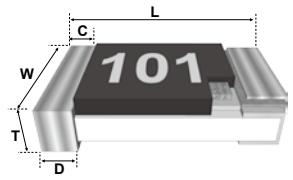
Narrow TCR Type*	Power Rating @ 70℃	Max. RCWV (V)	Max. Overload Voltage (V)	Temperauture Coefficient of Resistance (ppm/℃)	Resistance Tolerance (%)	Resistance Range		Standard Resistance Values
						Min.	Max.	
0402	1/16W	50	100	±10 ±15 ±25 ±50	±0.1 ±0.25 ±0.5 ±1.0	40Ω	35KΩ	E24 E96
0603	3/20W	75	150			40Ω	130KΩ	
0805	1/5W	100	200			10Ω	350KΩ	
1206	2/5W	200	400			10Ω	1MΩ	

Type - Array

Type	Normal Type Power Rating @ 70℃	Max. RCWV (V)	Max. Overload Voltage (V)	Temperauture Coefficient of Resistance (ppm/℃)	Resistance Tolerance (%)	Resistance Range		Standard Resistance Values
						Min.	Max.	
340 : 0603x4	1/10W	75	150	±25 ±50	±0.1 ±0.25 ±0.5 ±1.0	20Ω	200KΩ	E24 E96

■ Thin Film Lead Free High Precision Chip Resistors

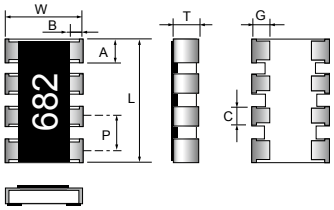
DIMENSIONS



unit: mm

Size	L	W	C	D	T
0201	0.60±0.03	0.30±0.03	0.10±0.05	0.15±0.05	0.23±0.03
0402	1.00±0.10	0.50±0.05	0.30±0.15	0.30±0.15	0.35±0.05
0603	1.55±0.10	0.80±0.10	0.25±0.15	0.30±0.15	0.45±0.15
0805	2.00±0.10	1.25±0.10	0.25±0.20	0.40±0.20	0.50±0.15
1206	3.05±0.15	1.55±0.15	0.40±0.20	0.40±0.20	0.55±0.15
1210	3.10±0.10	2.60±0.15	0.50±0.20	0.50±0.20	0.55±0.10
2010	5.00±0.10	2.50±0.15	0.60±0.20	0.60±0.25	0.55±0.10
2512	6.35±0.10	3.20±0.15	0.60±0.20	0.90±0.25	0.55±0.10

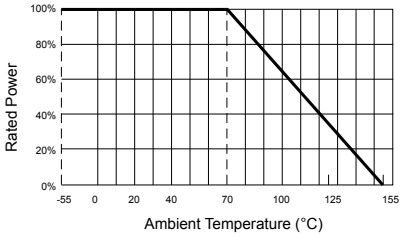
Note : Precise data Pls refer to detail's spec.



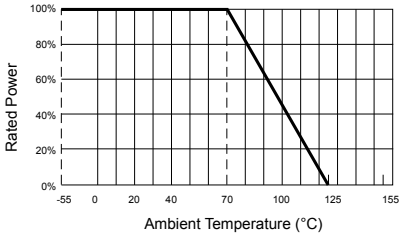
unit: mm

Type	L	W	A	B	P	C	G	T
FAF340 0603x4 Convex Type	3.20±0.15	1.50±0.15	0.60±0.10	0.40±0.15	0.80±0.10	0.40±0.10	0.30±0.15	0.45±0.10

POWER DE-RATING CURVE



for 2512, 2010, 1210, 1206, 0805, 0603, 0402. Array



for 0201

APPENDIX

RESISTANCE MARKING

E 12 series
E 24 series

3 digit marking for ±1%, ±5% E24 / E12 / E6
examples: **473** 47×10^{3} =47KΩ , **1R5** =1.5Ω

E 96 series

4 digit marking for E96
examples: **1542** 154×10^{2} =15K4Ω , **22R1** =22.1Ω

3 digit marking for E96 - 0603
examples: **02C** (Table 1) 102×10^{2} =10K2Ω

- No Marking of 0402 / 0201 / 01005.

0603 1% MARKING TABLE (TABLE 1)

Code	E48	E96	Code	E48	E96	Code	E48	E96	Code	E48	E96
01	100	100	25	178	178	49	316	316	73	562	562
02		102	26		182	50		324	74		576
03	105	105	27	187	187	51	332	332	75	590	590
04		107	28		191	52		340	76		604
05	110	110	29	196	196	53	348	348	77	619	619
06		113	30		200	54		357	78		634
07	115	115	31	205	205	55	365	365	79	649	649
08		118	32		210	56		374	80		665
09	121	121	33	215	215	57	383	383	81	681	681
10		124	34		221	58		392	82		698
11	127	127	35	226	226	59	402	402	83	715	715
12		130	36		232	60		412	84		732
13	133	133	37	237	237	61	422	422	85	750	750
14		137	38		243	62		432	86		768
15	140	140	39	249	249	63	442	442	87	787	787
16		143	40		255	64		453	88		806
17	147	147	41	261	261	65	464	464	89	825	825
18		150	42		267	66		475	90		845
19	154	154	43	274	274	67	487	487	91	866	866
20		158	44		280	68		499	92		887
21	162	162	45	287	287	69	511	511	93	909	909
22		165	46		294	70		523	94		931
23	169	169	47	301	301	71	536	536	95	953	953
24		174	48		309	72		549	96		976

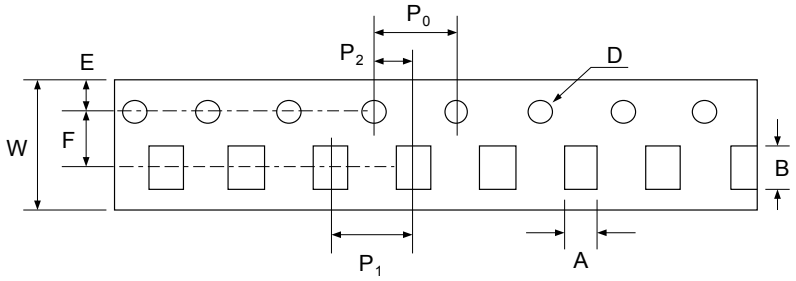
Code	A	B	C	D	E	F	G	H	X	Y	Z
Multiplier	10^{0}	10^{1}	10^{2}	10^{3}	10^{4}	10^{5}	10^{6}	10^{7}	10^{-1}	10^{-2}	10^{-3}

IEC-63 NOMINAL RESISTANCE / CAPACITANCE

E12	**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

TAPE AND REEL PACKAGE

Taping specs are according to EIA RS-481

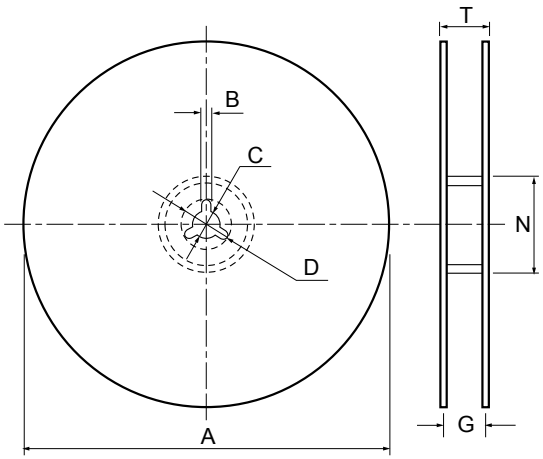


• Accumulated dimensional tolerance 40±0.2mm

unit: mm

Size	A	B	W	F	E	P_1	P_2	P_0	D
01005	0.24±0.03	0.45±0.03	8.00±0.20	3.50±0.05	1.75±0.10	2.00±0.05	2.00±0.05	4.00±0.10	1.50+0.10/-0
0201	0.37±0.05	0.67±0.05	8.00±0.20	3.50±0.05	1.75±0.10	2.00±0.05	2.00±0.05	4.00±0.10	1.50+0.10/-0
0402	0.70±0.10	1.20±0.10	8.00±0.30	3.50±0.05	1.75±0.10	2.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0
0603	1.10±0.20	1.90±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0
0805	1.65±0.20	2.40±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0
1206	2.00±0.20	3.60±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0
1210	3.00±0.20	3.60±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0
2010	2.80±0.20	5.50±0.20	12.00±0.30	5.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0
2512	3.50±0.20	6.70±0.20	12.00±0.30	5.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0

Reel Package



unit: mm

Size	Packaging Q'ty	Reel Diameter	A	N	C	D	B	G	T
01005	20Kpcs / Reel	7″ reel	178.0±2.0	60.0±0.5	13.0±0.5	20min	2.0±0.5	9.0±1.0	14.9 max.
0201 0402	15Kpcs / Reel	7″ reel	178.0±2.0	60.0±0.5	13.0±0.5	20min	2.0±0.5	10.0±1.5	14.9 max.
	10Kpcs / Reel	7″ reel	178.0±2.0	60.0±0.5	13.0±0.5	20min	2.0±0.5	10.0±1.5	14.9 max.
	20Kpcs / Reel	10″ reel	254.0±2.0	100.0±1.0	13.5±0.5	20min	2.0±0.5	10.0±1.5	14.9 max.
	50Kpcs / Reel	13″ reel	330.0±2.0	100.0±1.0	13.5±0.5	20min	2.0±0.5	10.0±1.5	14.9 max.
0603 0805 1206 1210	5Kpcs / Reel	7″ reel	178.0±2.0	60.0±0.5	13.0±0.5	20min	2.0±0.5	10.0±1.5	14.9 max.
	10Kpcs / Reel	10″ reel	254.0±2.0	100.0±1.0	13.5±0.5	20min	2.0±0.5	10.0±1.5	14.9 max.
	20Kpcs / Reel	13″ reel	330.0±2.0	100.0±1.0	13.5±0.5	20min	2.0±0.5	10.0±1.5	14.9 max.
2010 2512	4Kpcs / Reel	7″ reel	178.0±2.0	60.0±0.5	13.0±0.5	20min	2.0±0.5	13.8±1.5	16.7 max.
	8Kpcs / Reel	10″ reel	254.0±2.0	100.0±1.0	13.5±0.5	20min	2.0±0.5	13.8±1.5	16.7 max.
	16Kpcs / Reel	13″ reel	330.0±2.0	100.0±1.0	13.5±0.5	20min	2.0±0.5	13.8±1.5	20.0 max.

APPENDIX

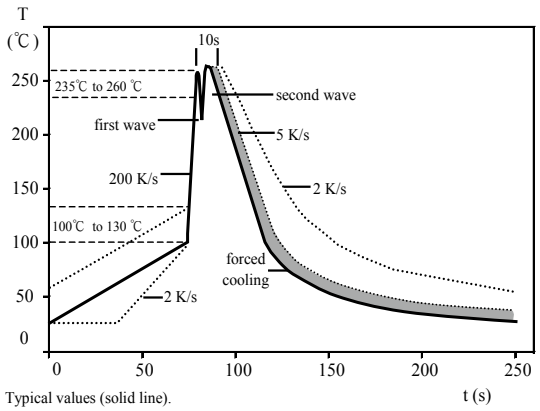
POWER CODE TABLE (TABLE 2)

Code	Power	Code	Power	Code	Power	Code	Power
T	1/20W	**S**	1/5W	**Q**	2/3W	**K**	3W
A	1/16W	**R**	2/5W	**G**	3/4W	**L**	4W
B	1/10W	**D**	1/4W	**H**	1W	**M**	5W
C	1/8W	**E**	1/3W	**I**	1.5W	**N**	10W
U	3/20W	**F**	1/2W	**J**	2W		

TCR CODE TABLE (TABLE 3)

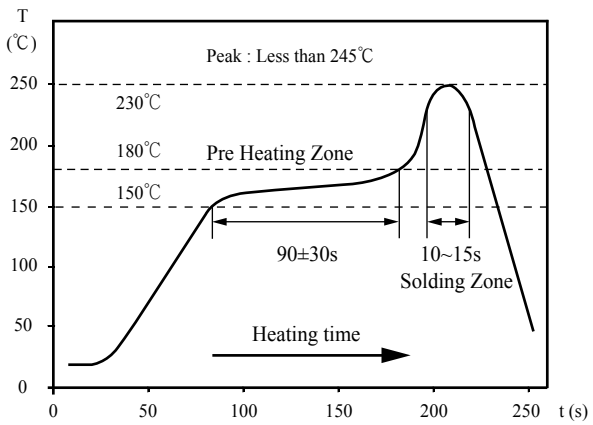
Code	TCR	Code	TCR	Code	TCR	Code	TCR
G	1200	**L**	200	**X**	70	**W**	5
H	1000	**Y**	150	**P**	50	**A**	1
I	800	**Z**	250	**Q**	25	**B**	2
J	600	**M**	350	**S**	15	**C**	3
K	400	**N**	100	**V**	10		

SOLDERING TEMPERATURE CURVE



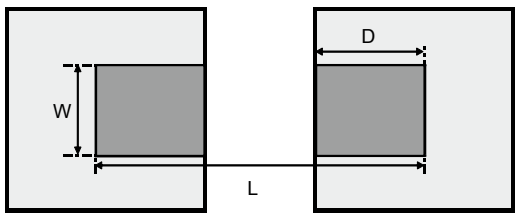
Typical values (solid line).
Process limits (dotted line).

WAVE soldering.



IR Reflow soldering.

RECOMMAND SOLDER PAD DIMENSION



unit: mm

Type	W	D	L
FPF03	0.9	1	3
FPF05	1.3	1.15	3.5
FPF06	1.8	1.3	4.7
FPF12	3	1.3	4.7
FPF20	3	1.5	6.8
FPF25	3.7	2.45	7.6

* FPF/FPS SERIES

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信昌電子陶瓷
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Sales offices

台灣營業處 Taiwan Sales Office
總公司營業處 Sales Office - Headquarter

32668 桃園市楊梅區高獅路 566-1 號
No. 566-1, Kao-Shi Rd., Yangmei,
Taoyuan 32668, Taiwan
Tel: +886-3-475-3355
Fax: +886-3-485-4959
E-mail: service@pdc.com.tw

桃園營業處 Sales Office - Tao Yuan

33860 桃園市蘆竹區南山路二段 220-1 號
No. 220-1, Sec. 2, Nanshan Rd., Lujhu,
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Tel: +886-3-322-4471
Fax: +886-3-322-9671
E-mail: service@pdc.com.tw
service-powder@pdc.com.tw

中國營業處 China Sales Office
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No. 638, Mei Jing West Road Xiniupo
Administrative Zone Dalang Town,
Dong Guan City, GuangDong Province, China
Tel: +86-769-8555-0979
Fax: +86-769-8555-0972
E-mail: service@pdc.com.tw

Plants

楊梅廠 (MLCC) Yang Mei Plant

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Taoyuan 32668, Taiwan
Tel: +886-3-475-3355
Fax: +886-3-485-4959

桃園廠 (Chip-R, Powder) Tao Yuan Plant

33860 桃園市蘆竹區南山路二段 220-1 號
No. 220-1, Sec. 2, Nanshan Rd., Lujhu,
Taoyuan 33860, Taiwan
Tel: +886-3-322-4471
Fax: +886-3-322-9671

吳江廠 (Powder) Wu Jiang Plant

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龐金路 2588 路
No.2588, Pangjin Rd., Economic Development Zone,
Wujiang, Jiangsu 215200
Tel: +86-512-6300-8899
Fax: +86-512-6300-9988

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Fax: +86-746-8610-616

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