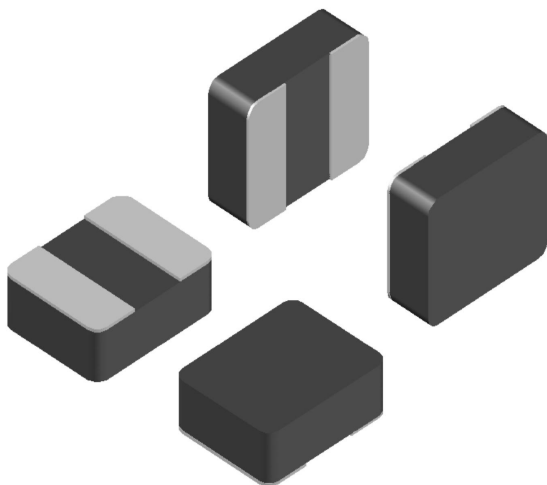


## FTC201610 Series

This specification applies to FTC Series of Mini Molded Chip Power Inductor.



### 1 SPECIFICATION



#### 1.2 APPLICATIONS

- Voltage Regulator Module (VRM)
- Multi-phase regulators
- Point-of-load modules
- Smart phone POL modules
- SSD modules
- Notebook regulators
- Battery power systems
- Graphics cards
- Data networking and storage systems
- DC/DC converter
- Cellular phones, LCD displays, HDDs
- Thin type on-board power supply module for exchanger

#### 1.1 DESCRIPTION

- Halogen Free
- 125°C maximum total temperature operation
- 2.2 x 1.8 x 1.0mm maximum surface mount package
- Magnetically shielded, low EMI
- High current carrying capacity, Low core losses
- RoHS compliant

#### 1.3 ENVIRONMENTAL DATA

- Storage temperature range: -55°C to +125 °C
- Operating temperature range: -55°C to +125°C  
(ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant

#### 1.4 PRODUCT IDENTIFICATION

##### FTC 201610-R24 M

(1) (2) (3) (4)

(1)Product Series

(2)Choke Size

(3)Initial Inductance(L @ 0A):R24=0.24μH

(4)Inductance Tolerance:M=L+/-20%

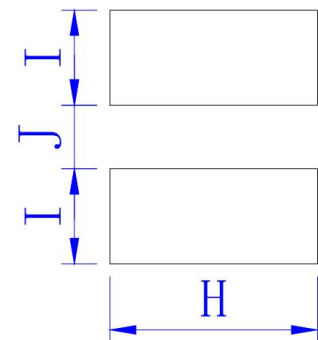
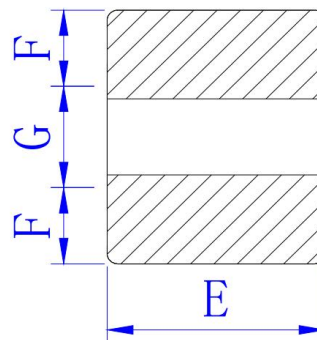
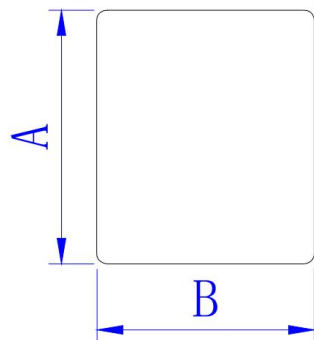
**1.5 ELECTRICAL PARAMETERS**

Part Number	L0	I <sub>rms</sub>	I <sub>rms</sub>	I <sub>sat</sub>	I <sub>sat</sub>	DCR	DCR
	(μH)	(Amp)	(Amp)	(Amp)	(Amp)	(mΩ )	(mΩ )
	± 20%	Max.	Typ.	Max.	Typ.	Typ.	Max.
						@25℃	@25℃
FTC201610-R22M	0.22±20%	5.8	6.38	6.3	6.93	12	19
FTC201610-R24M	0.24±20%	5.8	6.38	6.3	6.93	12	19
FTC201610-R33M	0.33±20%	5.3	5.83	6.2	6.82	17	22
FTC201610-R47M	0.47±20%	5.6	6.16	6	6.6	22	25
FTC201610-R68M	0.68±20%	5	5.5	5.5	6.05	25	32
FTC201610-1R0M	1±20%	4.1	4.51	4.2	4.62	35	43
FTC201610-1R5M	1.5±20%	2.3	2.53	2.9	3.19	80	100
FTC201610-2R2M	2.2±20%	2.1	2.31	2.8	3.08	120	150
FTC201610-3R3M	3.3±20%	1.5	1.65	2	2.2	140	180
FTC201610-4R7M	4.7±20%	1.15	1.265	1.5	1.65	210	250

**Notes :**

1. Initial Inductance (L<sub>0</sub>) Test Parameters: 1MHz, 1V, I<sub>dc</sub>=0.0A, +25℃
2. Operating temperature range - 55 °C to + 125 °C
3. I<sub>dc</sub>(A):DC current (A) that will cause an approximate ΔT of 40 °C
4. I<sub>SAT</sub>(A):DC current (A) that will cause L<sub>0</sub> to drop approximately 30 %
5. The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.
6. The rated current as listed is either the saturation current or the heating current depending on which value is lower.

## 1.6 DIMENSION-mm



RECOMMENDED  
LAND PATTERNS

顶部印字 Marking: 不印字

A	B	C	E Typical	F Typical	G Typical	H Typical	I Typical	J Typical
2.0±0.2	1.6±0.2	1.00MAX	1.60	0.70	0.60	1.80	0.85	0.50

(unit:mm)

### Notes :

1. Tolerances are +/-0.1millimeters unless stated otherwise
2. Dimensions of recommended PCB layout are reference only.
3. Do not route traces nor place vias underneath the inductor. Proper layout is required.

## 2. Reliability Data

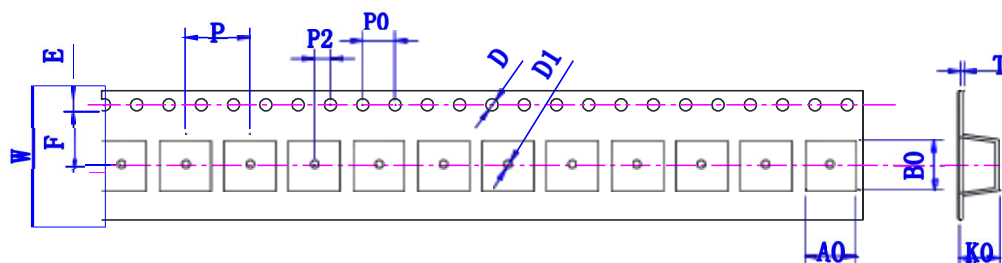
No.	Items	Requirements	Test Methods and Remarks
2.1	Insulation Resistance	$\geq 100M\Omega$	100 V DC between inductor coil and The middle of the top surface of the body for 60 seconds.
2.2	Solderability	90% or more of electrode area shall be coated by new solder.	Dip pads in flux and dip in solder pot (96.5Sn/3.0Ag/0.5Cu) at $(245\pm 5)^{\circ}\text{C}$ for $(5\pm 1)$ seconds.
2.3	Resistance to Soldering Heat	No visible mechanical damage. Inductance change: Within $\pm 10\%$	Dip pads in flux and dip in solder pot (96.5Sn/3.0Ag/0.5Cu) at $(260\pm 5)^{\circ}\text{C}$ for $(10\pm 1)$ seconds.
2.4	Adhesion of terminal electrode	Strong bond between the pad and the core, without come offPC board.	Inductors shall be subjected to $(260\pm 5)^{\circ}\text{C}$ for $(20\pm 5)$ s Soldering in the base whit 0.3mm solder. And then aplomb electrode way plus tax 10 N for $(10\pm 1)$ seconds.
2.5	High temperature	No visible mechanical damage. Inductance change: Within $\pm 10\%$	Temperature is $(+85\pm 2)^{\circ}\text{C}$ and keep $(96\pm 2)$ hours.
2.6	Low temperature	No visible mechanical damage. Inductance change: Within $\pm 10\%$	Temperature is $(-40\pm 2)^{\circ}\text{C}$ and keep $(96\pm 2)$ hours.

( Continue on the table)

No.	Items	Requirements	Test Methods and Remarks
2.7	Thermal shock	No visible mechanical damage. Inductance change: Within $\pm 10\%$	The test sample shall be placed at $(-40\pm 3)^{\circ}\text{C}$ and $(125\pm 2)^{\circ}\text{C}$ for $(30\pm 3)$ min, different temperature conversion time is 2~3 minutes. The temperature cycle shall be repeated 32 cycles. Placed at room temperature for 2 hours, within 48 hours of testing.
2.9	Temperatur characteristic	Inductance change $P_{c-b}, P_{c-d}$ : Within $\pm 20\%$	a : $+20^{\circ}\text{C}$ (30~45) min $\rightarrow$ b: $-40^{\circ}\text{C}$ (30~45) min $\rightarrow$ c: $+20^{\circ}\text{C}$ (30~45) min $\rightarrow$ d: $+125^{\circ}\text{C}$ (30~45) min $\rightarrow$ e: $+20^{\circ}\text{C}$ (30~45) min $P_{c-b} = \frac{L_b - L_c}{L_c} \times 100\% ; P_{c-d} = \frac{L_d - L_c}{L_c} \times 100\%$
2.10	Static Humidity	No visible mechanical damage. Inductance change: Within $\pm 10\%$	Inductors shall be subjected to $(93\pm 3)\%RH$ . at $(60\pm 2)^{\circ}\text{C}$ for $(96\pm 2)$ h . Placed at room temperature for 2 hours, within 48 hours of testing.
2.11	Life	No visible mechanical damage. Inductance change: Within $\pm 10\%$	Inductors shall be store at $(85\pm 2)^{\circ}\text{C}$ for $(1000\pm 24)$ hours with Irms applied. Placed at room temperature for 2 hours, within 48 hours of testing.  Note: If the surface temperature of the part over $125^{\circ}\text{C}$ when the current is loaded, the current need to reduce until the surface temperature of the part less than $125^{\circ}\text{C}$ .

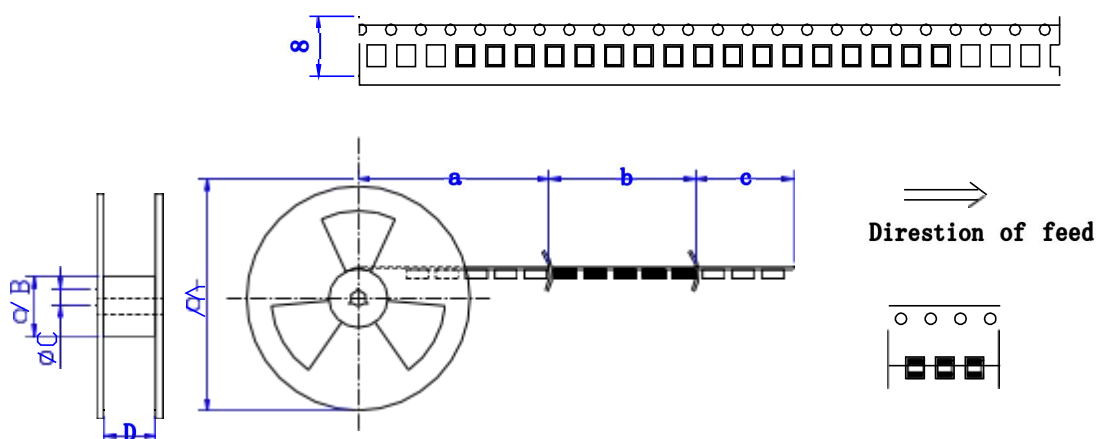
### 3. Package

#### 3.1. Tape Dimension( Unit:mm)



W	A0	B0	D	D1	E	F	K0	P0	P2	P	T
8±0.3	1.85±0.1	2.25±0.1	1.5±0.1	1.0MIN	1.75±0.1	3.5±0.1	1.15±0.1	4.0±0.3	2.0±0.3	4.0±0.3	0.25±0.05

#### 3.2. Direction of feed( Unit:mm)



A	B	C	D	a	b	c
178 Typical	58 Typical	13 Typical	8.4 Typical	Blank portions	Chip cavity	Leader

#### 3.3. Packing quantity

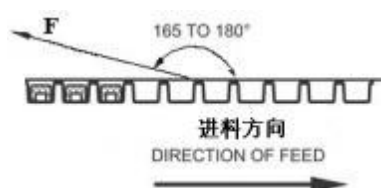
REEL (PCS)	BOX (PCS)	Carton (PCS)
3,000	15,000	150,000

#### 3.4. Peeling required

3.5. F force: 10~130g;

3.6. Peeling speed: 300mm/min±10%;

3.7. Peeling angle: 165°~180°.



## 4. Environmental Protection Statement

Response to RoHS directive : Our products are RoHS compliance.

## 5. Recommended soldering profile

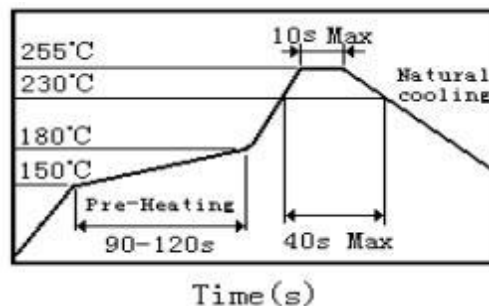
5.1.Applicable soldering process to the products is reflow soldering.

5.2. Soldering Materials

(1) Solder: Sn-3.0Ag-0.5Cu

(2)Flux: Use rosin-based flux, but not strongly acidic flux (with chlorine exceeding 0.2 wt%). Do not use water-soluble flux.

5.3. Soldering Profile



5.4. Soldering Iron

Reworking with electric soldering iron must preheating at 150°C for 1 minute is required, and do not directly touch the core with the tip of the soldering iron. The reworking soldering conditions are as follows:

5.4.1 Temperature of soldering iron tip : 350°C ;

5.4.2. Soldering iron power output: ≤30W;

5.4.3. Diameter of soldering iron end: ≤ 1.0mm;

5.4.4. Soldering time : <3 s

## 6. Cleaning

The following conditions should be observed when cleaning the product.

6.1.Cleaning Temperature: 60°C max. (40°C max. for alcohol cleaning ;

6.2.Ultrasonic:

Output: 20 W/L max.

Duration: 5 min max.

Frequency: 28 to 40kHz

6.3.Avoid the resonance between PCB and mounted products when it is cleaning.



## 7. Storage Methods

### 7.1. Storage Period

To maintain the solderability of terminal electrodes and to keep the packing material in good condition, product should be used within 6 months from the time of delivery. And the solderability of products electrodes may decrease as time passes, so in case of storage over 6 months, solderability shall be checked before actual usage.

### 7.2. Storage Conditions

#### 7.2.1. Store products in a warehouse in compliance with the following condition:

(Temperature): Inductors (product with taping) - 10 to +40℃;

Inductors body -40 to +85℃.

(Humidity): 30~70%RH.

#### 7.2.2. Do not subject products to rapid changes in temperature and humidity.

#### 7.2.3. Do not store the products in chemical atmosphere such as one containing sulfurous acid gas or alkaline gas, that will causes poor solderability and corrosion of inductors.

#### 7.2.4. Do not store products in bulk packaging to prevent collision among inductors which causes core chipping and wire breakage.

#### 7.2.5. Store products on pallets to protect from humidity, dust, etc.

#### 7.2.6. Avoid heat shock, vibration, direct sunlight, etc.

## 8. Precautions For Use

#### 8.1. Our products are designed and promoted for use in general electronic devices such as audio-equipment, office automation equipment, household appliance and information service.

#### 8.2. In case of using the product for the purpose other than general electronics devices, we shall not be held liable for any dysfunctions in or damage to the equipment with which the product is used.

#### 8.3. Our specification limits the quality of the component as a single unit. Please ensure the component is thoroughly evaluated in your application circuit.

#### 8.4. Do not apply excessive vibration or mechanical shock to products.

#### 8.5. Do not touch wire with sharp objects such as tweezers to prevent wire breakage.

#### 8.6. Do not apply excessive stress to products mounted on boards to prevent core breakage.