

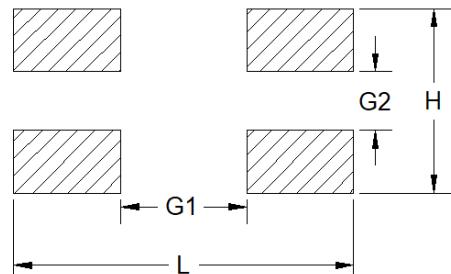
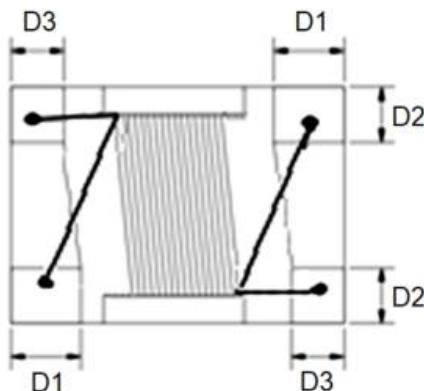
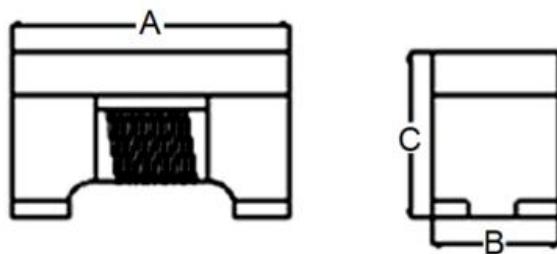
## 1. Part No. Expression

**WAQ 7 E N D 1 1 0 - R C - 1 0**

(a) (b) (c) (d) (e) (f) (g) (h)

(a) Series Code	(e) Inductance Code
(b) Dimension Code	(f) Packaging Code
(c) Material Code	(g) Current Code
(d) Type Code	(h) Internal Code

## 2. Configuration & Dimensions (Unit: mm)



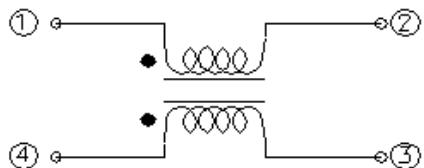
Recommended PCB Layout

Note: The above PCB layout reference only.

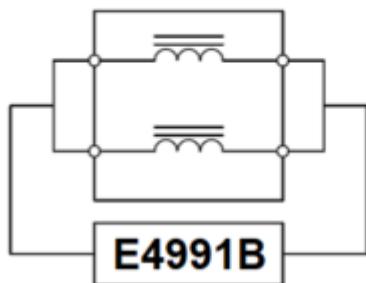
A	B	C	D1	D2
4.50±0.20	3.20±0.20	2.80±0.20	0.75±0.20	0.85±0.20
D3	L	H	G1	G2
0.60±0.20	5.00 Ref	3.60 Ref	3.40 Ref	1.70 Ref

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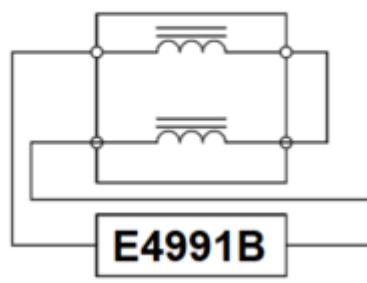
### 3. Schematic



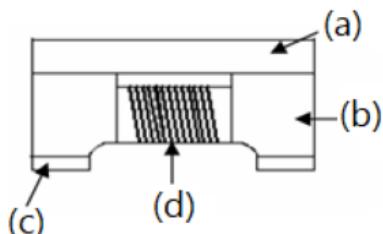
**Common mode**



**Differential mode**



### 4. Material List



- (a) Upper Plate
- (b) Core
- (c) Termination
- (d) Wire

### 5. General Specifications

- (a) Reliability test for this part meets AEC-Q200 standard.
- (b) Operating Temp.: -55°C to +150°C (including self-temperature rise)
- (c) Storage Temp.: -55°C to +125°C (on board)
- (d) All test data referenced to 25°C ambient.
- (e) Heat Rated Current (Irms) will cause the coil temperature rise  $\Delta T$  of 40°C Max.
- (f) Storage Condition (Component in its packaging)
  - i) Temperature: Less than 40°C
  - ii) Humidity: Less than 60% RH

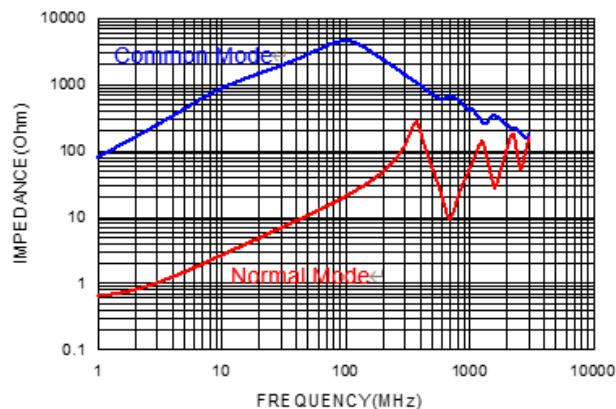
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## 6. Electrical Characteristics

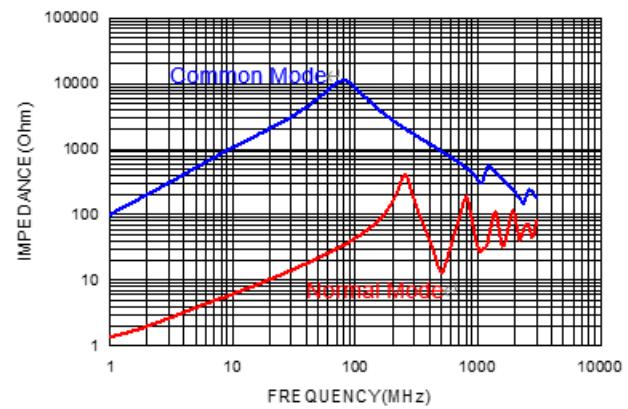
Part Number	Common mode Impedance( $\Omega$ ) @10MHz		Inductance( $\mu$ H) +50%/-30% @0.1V/100KHz	DCR ( $\Omega$ ) Max	Rated Current (mA)	Withstand Voltage (V <sub>DC</sub> ) Max	Rated Voltage (V <sub>DC</sub> ) Max	IR (M $\Omega$ ) Min
	Min	Typ						
WAQ7FND110-RC-10	300	600	11	0.6	360	125	50	10
WAQ7FND220-RC-10	500	1200	22	1.0	310	125	50	10
WAQ7FND510-RB-10	1000	2800	51	1.0	230	125	50	10
WAQ7FND101-RB-10	2000	5800	100	2.0	200	125	50	10

## 7. Characteristics Curve

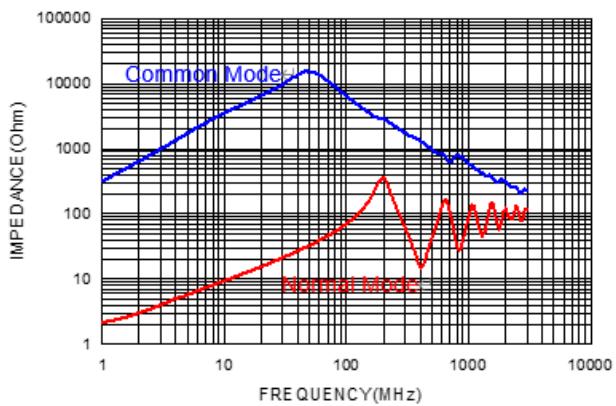
WAQ7FND110-RC-10



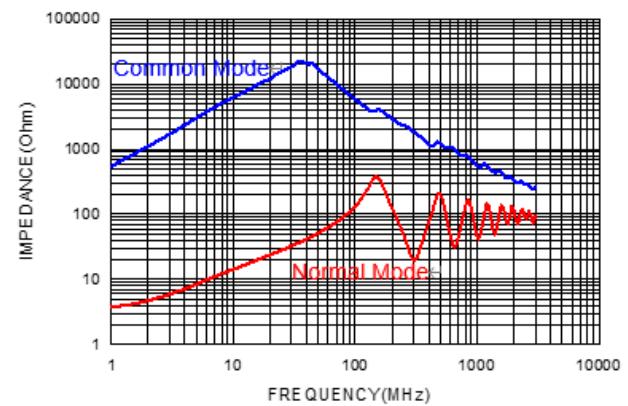
WAQ7FND220-RC-10



WAQ7FND510-RB-10



WAQ7FND101-RB-10



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## 8. Soldering Specification

Mildly activated rosin fluxes are preferred. Our terminations are suitable for re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

### 8-1. IR Soldering Reflow

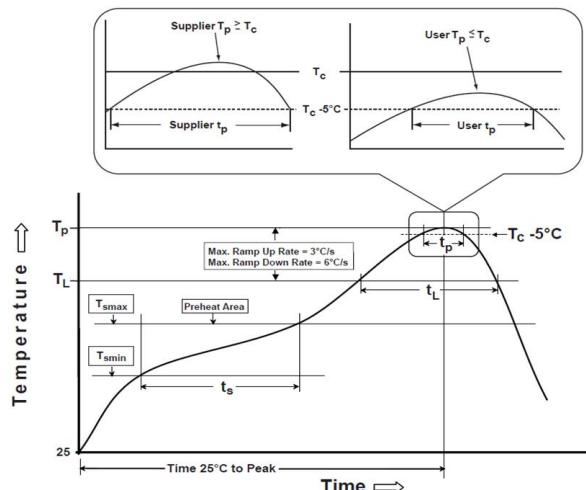
Recommended temperature profiles for lead free re-flow soldering in Figure 1, Table 1.1 & 1.2 (J-STD-020F).

### 8-2. Iron Reflow

Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended (Figure 2).

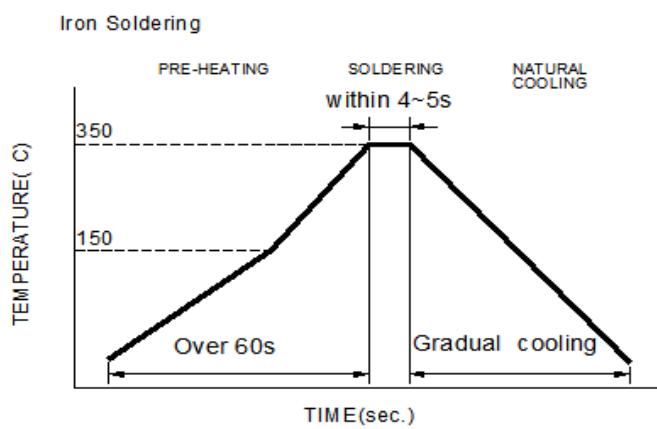
Note:

- (a) Preheat circuit and products to 150°C.
- (b) 350°C tip temperature (Max.)
- (c) Never contact the ceramic with the iron tip
- (d) 1.0mm tip diameter (Max.)
- (e) Use a 20 watt soldering iron with tip diameter of 1.0mm
- (f) Limit soldering time to 4~5 sec.



Reflow times: 3 times Max

Figure 1: IR Soldering Reflow



Iron Soldering times : 1 times max

Figure 2: Iron soldering temperature profiles

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**Table (1.1) Reflow Profiles**

Profile Type:	Pb-Free Assembly
Preheat	
-Temperature Min ( $T_{smin}$ )	150°C
-Temperature Max ( $T_{smax}$ )	200°C
-Time ( $t_s$ ) from ( $T_{smin}$ to $T_{smax}$ )	60-120seconds
Ramp-up rate ( $T_L$ to $T_p$ )	3°C /second max.
Liquids temperature ( $T_L$ )	217°C
Time ( $t_L$ ) maintained above $T_L$	60-150 seconds
Classification temperature ( $T_c$ )	See Table (1.2)
Time ( $t_p$ ) at $T_c$ - 5°C (Tp should be equal to or less than $T_c$ .)	< 30 seconds
Ramp-down rate ( $T_p$ to $T_L$ )	6°C /second max.
Time 25°C to peak temperature	8 minutes max.

**Tp:** maximum peak package body temperature, **Tc:** the classification temperature.

For user (customer) **Tp** should be equal to or less than **Tc**.

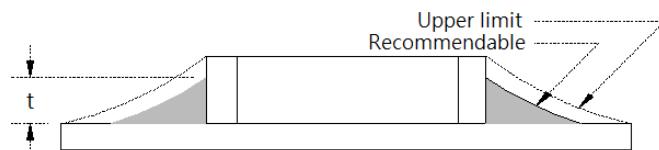
**Table (1.2) Package Thickness/Volume and Classification Temperature ( $T_c$ )**

	Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
PB-Free Assembly	<1.6mm	260°C	260°C	260°C
	1.6-2.5mm	260°C	250°C	245°C
	≥2.5mm	250°C	245°C	245°C

Reflow is referred to standard IPC/JEDEC J-STD-020F.

### 8-3. Soldering Volume

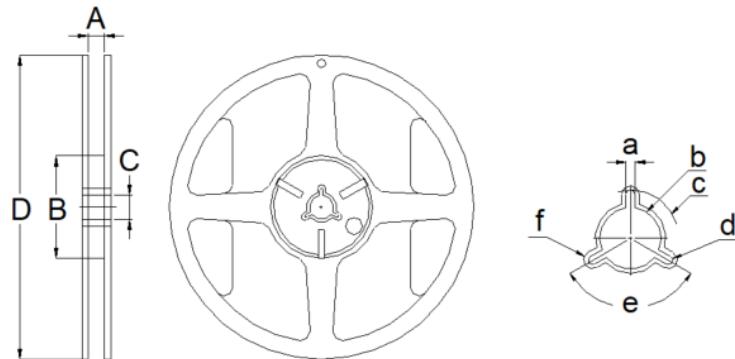
Accordingly increasing the solder volume, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance. Solder shall be used not to be exceeded as shown in the Figure below. Minimum fillet height = soldering thickness + 25% product height.



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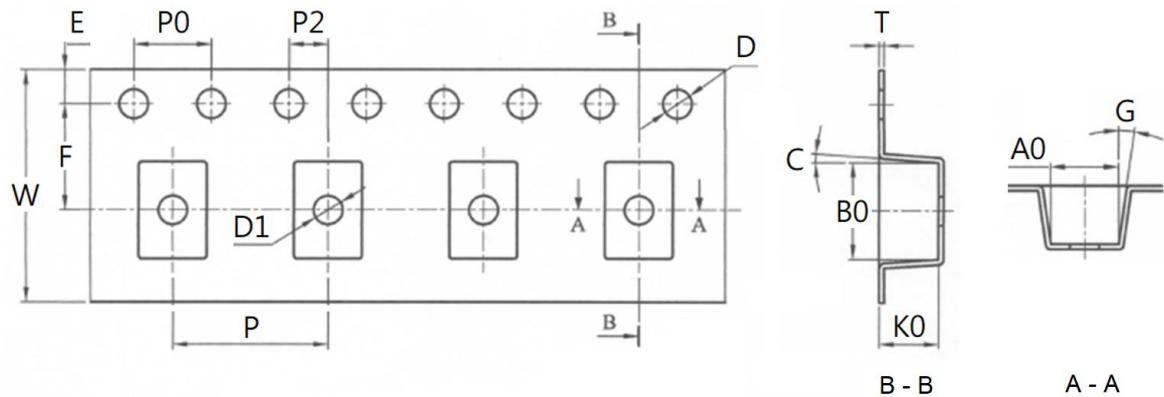
## 9. Packaging Information

### 9-1. Reel Dimension (Unit: mm)



Type	A	B	C	D	a
	13.5 Ref	60.0 Ref	13.5 Ref	178.0 Ref	2.0 Ref
7"x12mm	b	c	d	e	f
	13.5 Ref	R10.5	R0.5	120°	R1.9

### 9-2. Tape Dimension (Unit: mm)



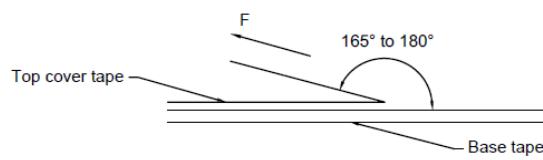
P	P0	P2	B0	A0	K0	D
8.00±0.10	4.00±0.10	2.00±0.05	4.90±0.10	3.60±0.10	3.00±0.10	1.50+0.10/-0.00
E	F	W	T	D1	C	G
1.75±0.10	5.50±0.05	12.00±0.10	0.26±0.05	1.50±0.10	4°	8°

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## 9-3. Packaging Quantity (Unit: Pcs)

Chip/ Reel	500
Inner Box	2,000
Middle Box	10,000
Carton	20,000

## 9-4. Tearing Off Force



The force for tearing off cover tape is according to the follow table, in the arrow direction under the following conditions.

(Referenced ANSI/EIA-481-D-2008 of 4.11 standard)

Room Temp. (°C)	Room Humidity (%)	Room atm (hPa)	Tearing Speed (mm/min)
5~35	45~85	860~1060	300±10

Tape Size	8 mm	12 to 56 mm	72 mm or Wider
Tearing Off Force (grams)	10~100	10~130	10~150

## Application Notice

### 1. Storage Conditions

To maintain the solderability of terminal electrodes:

- (a) Products meet IPC/JEDEC J-STD-020F standard-MSL, level 1.
- (b) Recommended products should be used within 12 months from the time of delivery.
- (c) The packaging material should be kept where no chlorine or sulfur exists in the air.

### 2. Transportation

- (a) Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
- (b) Vacuum pick up is strongly recommended for individual components.
- (c) Bulk handling should ensure that abrasion and mechanical shock are minimized.

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