

ECN/PCN No.: 3683

For Manufacturer		
<b>Product Description:</b> Thru Hole	<b>Abracon Part Number / Part Series:</b> 954-4.5M-D	<input type="checkbox"/> Series <input checked="" type="checkbox"/> Part Number
<b>Affected Revision:</b>	<b>New Revision:</b> EOL	<b>Application:</b> <input type="checkbox"/> Safety <input checked="" type="checkbox"/> Non-Safety
<b>Prior to Change:</b> 954-4.5M-D (PDF available in page 2)		
<b>After Change:</b>  EOL		
<b>Cause/Reason for Change:</b>  Discontinuation of this older product package type and associated manufacturing capability.		
Change Plan		
<b>Effective Date:</b> 9/29/2020	<b>Additional Remarks:</b>	
<b>Change Declaration:</b>		
<b>Issued Date:</b> 9/23/2020	<b>Issued By:</b> <i>Stephanie Lopez</i>	<b>Issued Department:</b> Engineering
<b>Approval:</b> <i>Thomas Culhane</i> Engineering Director	<b>Approval:</b> <i>Reuben Quintanilla</i> Quality Director	<b>Approval:</b> <i>Ying Huang</i> Purchasing Director
For Abracon EOL only		
<b>Last Time Buy (if applicable):</b> <i>Not Applicable</i>	<b>Alternate Part Number / Part Series:</b> <i>Not Available</i>	
<b>Additional Approval:</b> Swati Srivastava - PLM	<b>Additional Approval:</b>	<b>Additional Approval:</b>
Customer Approval (If Applicable)		
<b>Qualification Status:</b> <input type="checkbox"/> Approved <input type="checkbox"/> Not accepted <i>Note: It is considered approved if there is no feedback from the customer 1 month after ECN/PCN is released.</i>		
<b>Customer Part Number:</b>	<b>Customer Project:</b>	
<b>Company Name:</b>	<b>Company Representative:</b>	<b>Representative Signature:</b>
<b>Customer Remarks:</b>		

**1 SCOPE**

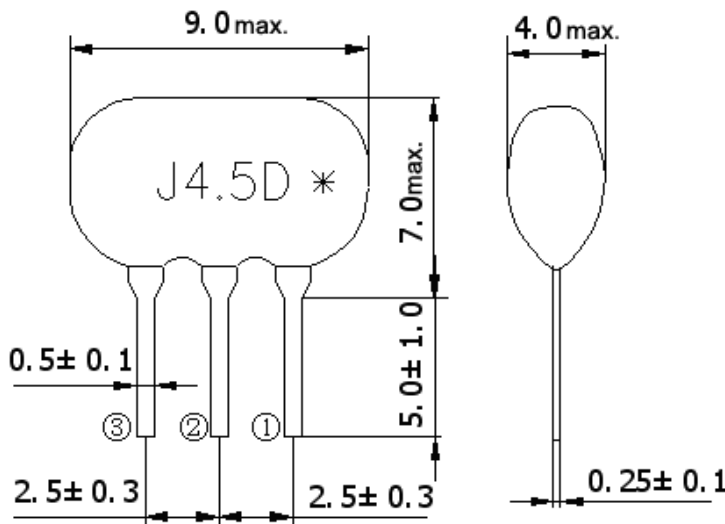
This specification is applied to the ceramics discriminator used with FM receiver. Please contact us before using any of the products in the applications not described above.

**2 PART NO.**

PART NUMBER	CUSTOMER PART NO	SPECIFICATION NO
954-4.5M-D		

**3 OUTLINE DRAWING AND STRUCTURE**

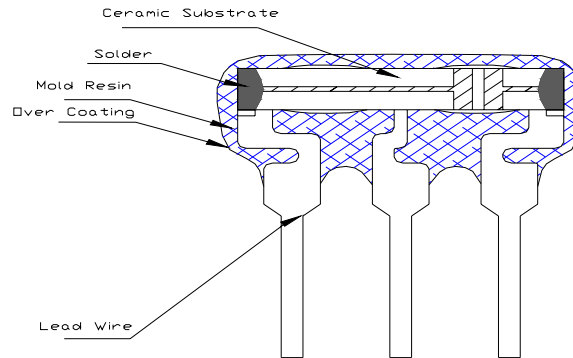
- 3.1 Appearance: No visible damage and dirt.
- 3.2 Construction: Leads are soldered on electrode and body is molded by resin.
- 3.3 Except the chip(ceramic element), the materials don't contain lead.
- 3.4 Dimensions



- ① Input
- ② Ground
- ③ Output

\*:EIAJ Monthly Code

### 3.4 STRUCTURE



Component	Material
Lead Wire	Solder plating copper or iron wire
Mold Resin	epoxy resin
Solder	High-melting solder
Ceramic Substrate	Lead titanate-zirconate
Over coating	Clear Epoxy Resin

### 4 RATING AND ELECTRICAL SPECIFICATIONS:

#### 4.1 RATING

Items	Content
Withstanding Voltage (V)	50 (DC, 1min)
Maximum applied DC voltage	10V
Temp. Coefficient of Freq (ppm/°C) max	±100 (Center Freq. drift, -20°C ~ 80°C)
Operating Temperature Range (°C)	-20 ~ +80
Storage Temperature Range (°C)	-40 ~ +85

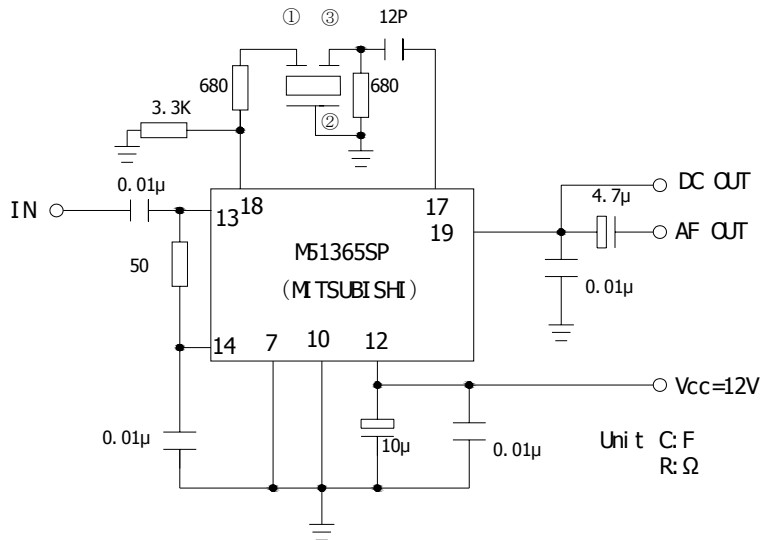
4.2 ELECTRICAL SPECIFICATIONS

Items	Content
Center Frequency $f_n$ (MHz)	4.5
Recovered Audio Voltage (at $f_o$ ) (mV) min.	250
Distortion (at $f_o$ ) (%) max.	1.2
Distortion 3.0% Bandwidth (from $f_n$ ) kHz min.	$\pm 40$
Recovered Audio 3dB Bandwidth kHz min.	$f_n \pm 65$

5 Test Conditions

Parts shall be tested under a condition (Temperature:  $+20^\circ\text{C} \pm 15^\circ\text{C}$ , Humidity:  $5\% \pm 20\% \text{R.H.}$ ) unless the standard condition (Temperature:  $+25^\circ\text{C} \pm 2^\circ\text{C}$ , Humidity:  $65\% \pm 5\% \text{R.H.}$ ) is regulated to test.

5.1 Test Circuit



5.1.1 Input Signal : Input Level:  $80\text{dB}\mu\text{V}$

Modulation Frequency:  $1000\text{Hz}$

Frequency Deviation:  $\pm 22.5\text{kHz}$

5.1.2 Center Frequency ( $f_o$ ) : Center frequency is measured under the condition that modulated and  $80\text{dB}\mu\text{V}$  input signal (center) is supplied and varied its frequency. It is defined as the frequency at that D.C.output Voltage shall correspond to that for  $0\text{dB}\mu\text{V}$  input signal.

5.1.3 Recovered Audio Voltage: It is defined as the recovered audio voltage at center frequency ( $f_o$ )

- 5.1.4 Distortion: It is defined as the distortion at center frequency ( $f_0$ ) .
- 5.1.5 It is defined as the difference between the nominal frequency ( $f_n$ ) and the center of two frequencies when the distortion of the recovered audio voltage is 3%.
- 5.1.6 Recovered Audio 3dB Bandwidth: It is defined as the difference between the nominal frequencies where the recovered audio voltage 3dB from the level of center frequency ( $f_0$ ) .

**6 PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS**

No	Item	Condition of Test	Requirements
6.1	Humidity	Subject the resonator at $+40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and 90%~95% R.H. for 100h, resonator shall be measured after being placed in natural conditions for 1h.	It shall fulfill the specifications in Table 1.
6.2	High Temperature Exposure	Subject the resonator to $+85^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 100h, resonator shall be measured after being placed in natural conditions for 1h.	It shall fulfill the specifications in Table 1.
6.3	Low Temperature Exposure	Subject the resonator to $-25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 100h, resonator shall be measured after being placed in natural conditions for 1h.	It shall fulfill the specifications in Table 1.
6.4	Temperature Cycling	Subject the resonator to $-25^{\circ}\text{C}$ for 30min. followed by a high temperature of $+85^{\circ}\text{C}$ for 30min. Cycling shall be repeated 5 times. Resonator shall be measured after being placed in natural conditions for 1h.	It shall fulfill the specifications in Table 1.
6.5	Vibration	Subject the resonator to vibration for 2h each in x y and z axis with the amplitude of 1.5mm, the frequency shall be varied uniformly between the limits of 10Hz~55Hz and then resonator shall be measured.	It shall fulfill the specifications in Table 1.
6.6	Mechanical Shock	Resonator shall be measured after 3 times' random dropping from the height of 1m on concrete floor.	No visible damage and it shall fulfill the specifications in Table 1.

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Ceramic Discriminator

6.7	Resistance to Soldering Heat	Lead terminals are immersed up to 2mm from resonator's body in soldering bath of $+260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for $10\text{s} \pm 1\text{s}$ and then resonator shall be measured after being placed in natural conditions for 1h.	It shall fulfill the specifications in Table 1.
6.8	Solderability	Lead terminals are immersed up to 2mm from resonator's body in soldering bath of $+250^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for $3\text{s} \pm 0.5\text{s}$ .	More than 95% of the terminal surface of the resonator shall be covered with fresh solder.
6.9	Terminal Strength	Force of 5N is applied to each lead in axial direction for $10\text{s} \pm 1\text{s}$ .	No any visible damage and it shall fulfill the specifications in Table1.
	Terminal Pulling	When force of 5N is applied to each lead in axial direction, the lead shall folded up $90^{\circ}$ from the axial direction and folded back to the axial direction.	
	Terminal Bending	The speed of folding shall be each 3s	

Table 1

Item	Specification after test
Recovered Audio 3dB Bandwidth kHz min	$f_n \pm 45$
Recovered Audio Voltage drift	$\pm 2\text{dB}$ max
Note : The limits in the above table are referenced to the initial measurements.	

EIAJ Monthly Code

2003 / 2005 / 2007 / 2009		2004 / 2006 / 2008 / 2010	
MONTH	CODE	MONTH	CODE
JAN	A	JAN	N
FEB	B	FEB	P
MAR	C	MAR	Q
APR	D	APR	R
MAY	E	MAY	S
JUN	F	JUN	T
JUL	G	JUL	U
AUG	H	AUG	V
SEP	J	SEP	W
OCT	K	OCT	X
NOV	L	NOV	Y
DEC	M	DEC	Z

**7 OTHER**

**7.1 Caution of use**

- 7.1.1 Do not use this product with bend. Please don't apply excess mechanical stress to the component and terminals at soldering.
- 7.1.2 The component may be damaged when an excess stress will be applied.
- 7.1.3 This specification mentions the quality of the component as a single unit. Please insure the component is thoroughly evaluated in your application circuit.
- 7.1.4 All kinds of re-flow soldering must not be applied on the component.
- 7.1.5 Cleaning or washing of the component is not acceptable due to non sealed construction.

**7.2 Notice**

- 7.2.1 Please return one of this specification after your signature of acceptance.
- 7.2.2 When something gets doubtful with this specifications, we shall jointly work to get an agreement.
- 7.2.3 Accurate test circuit values are required to measure electrical characteristics. It may be a cause of miss-correlation if there is any deviation, especially stray capacitance, from the test circuit in the specification.