

Background:

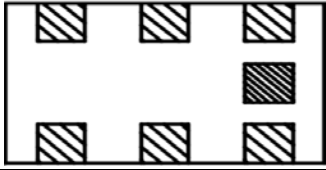
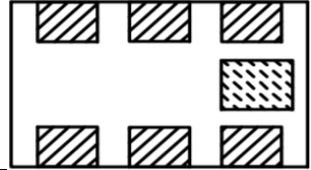
Mini-Circuits NCS2-33+ is LTCC based Ceramic Balun RF Transformer. Dielectric ceramic material has been discontinued by the supplier. Per EU RoHS directive 2011/65/EU, Exemption Note 7(c)-I for Pb in ceramic is subject to expiration. This exemption however is under appeal and has been extended.



Mini-Circuits is using alternate Pb-free material for NCS2-33+ which complies with EU RoHS expiration of exemption 7(c)I to replace the existing part. There is no change to case-style (GE0805C-1) or part # for this product. The Material Declaration will be available on the website. Please contact rohs@minicircuits.com for all other inquiries.

Replacement model with a new material has been judged by Mini-Circuits Engineering as a suitable replacement to original model.

Mechanical Aspect:

Parts with Original LTCC	Parts with Replacement LTCC
Case Style – GE0805C-1	Case Style – GE0805C-1
Part # - NCS2-33+	Part # - NCS2-33+
Marking on Unit – No marking	Marking on Unit – “No Marking”
	
No Change to Mechanical Dimension and terminal finish.	

Conclusion: The replacement LTCC material system is Form-Fit-Function Compatible

Notes:
a. Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, compatibility with other components and environmental conditions and stresses.

1) TYPICAL PERFORMANCE COMPARISON AT ROOM TEMPERATURE:

	Original Part- LTCC Containing Pb			Replacement Part- Pb Free LTCC			Data Sheet Specification (Rev B)			Unit
Run #	Y65516			H88950						
Date Code	1926			2149						
Date	6/27/2019			12/7/2021						
Qty.	108000			1000						
Tested By	Robot # 02			Robot # 16						
Specification	20-2284+-50, Rev. B			20-2284+-50, Rev. B						
Parameter	Min	Avg	Max	Min	Avg	Max	Min	Typ	Max	
Insertion Loss, dB (2300-2700 MHz)	-	0.31	-	-	0.12	-	-	1	-	dB
Amp. Unb (2300-2700 MHz)	-	0.44	-	-	0.31	-	-	0.6	-	dB
Pha. Unb (2300-2700 MHz)	-	4.43	-	-	5.93	-	-	5	-	deg
RL (2300-2700 MHz)	-	19.43	-	-	15.84	-	-	-	-	dB

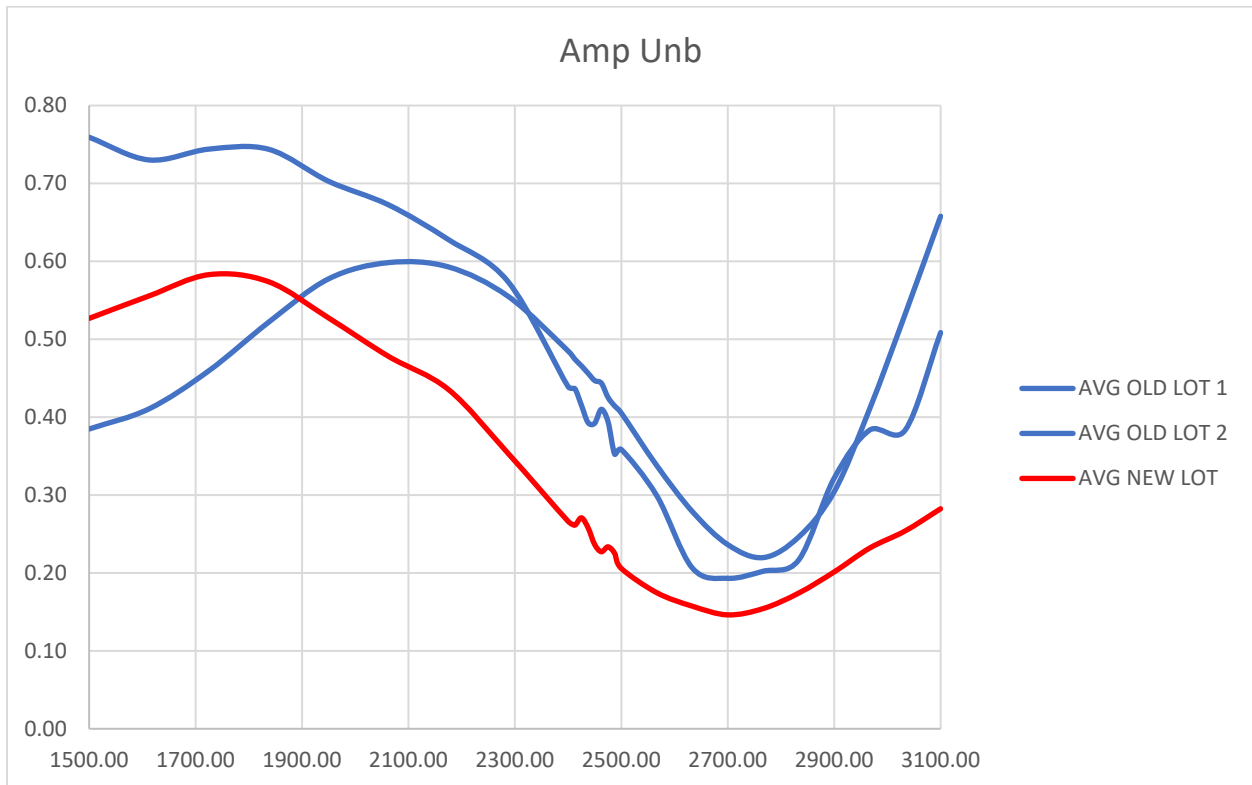
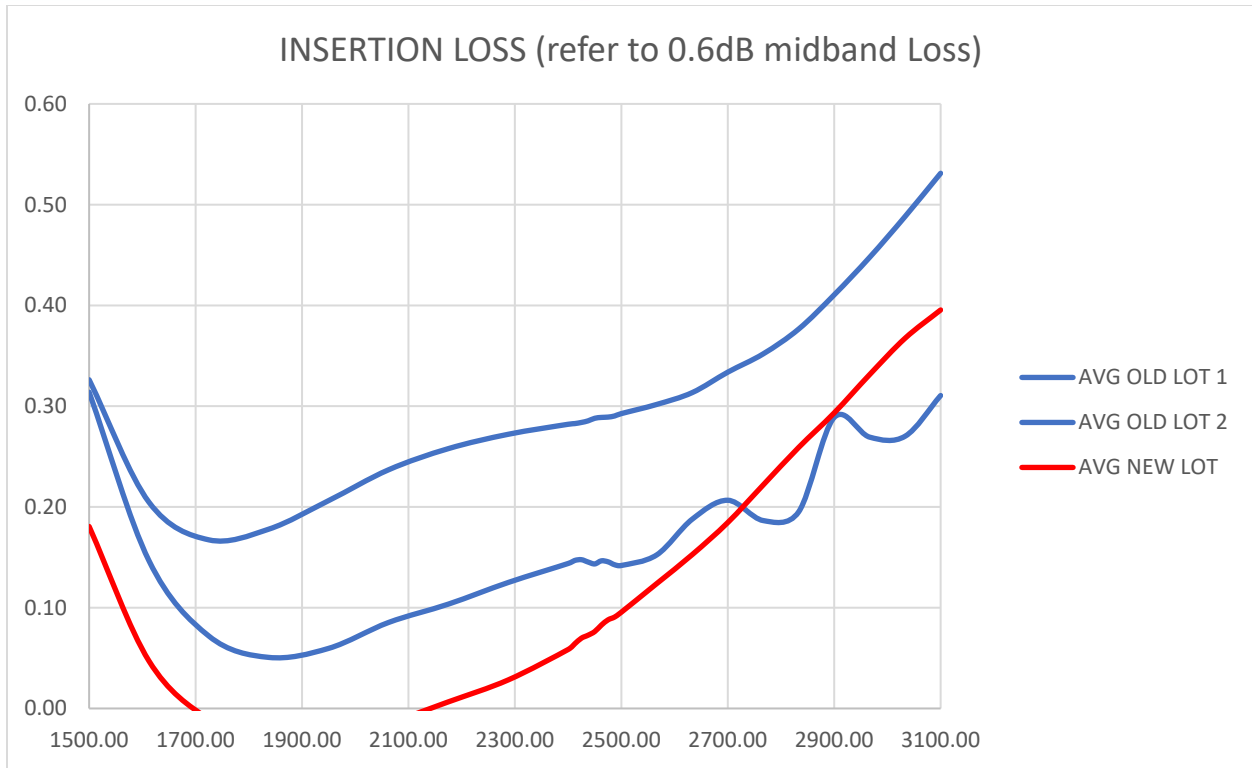
For typical performance and Graphs: See paragraphs below.

2) TYPICAL PERFORMANCE GRAPHS AT ROOM TEMPERATURE:

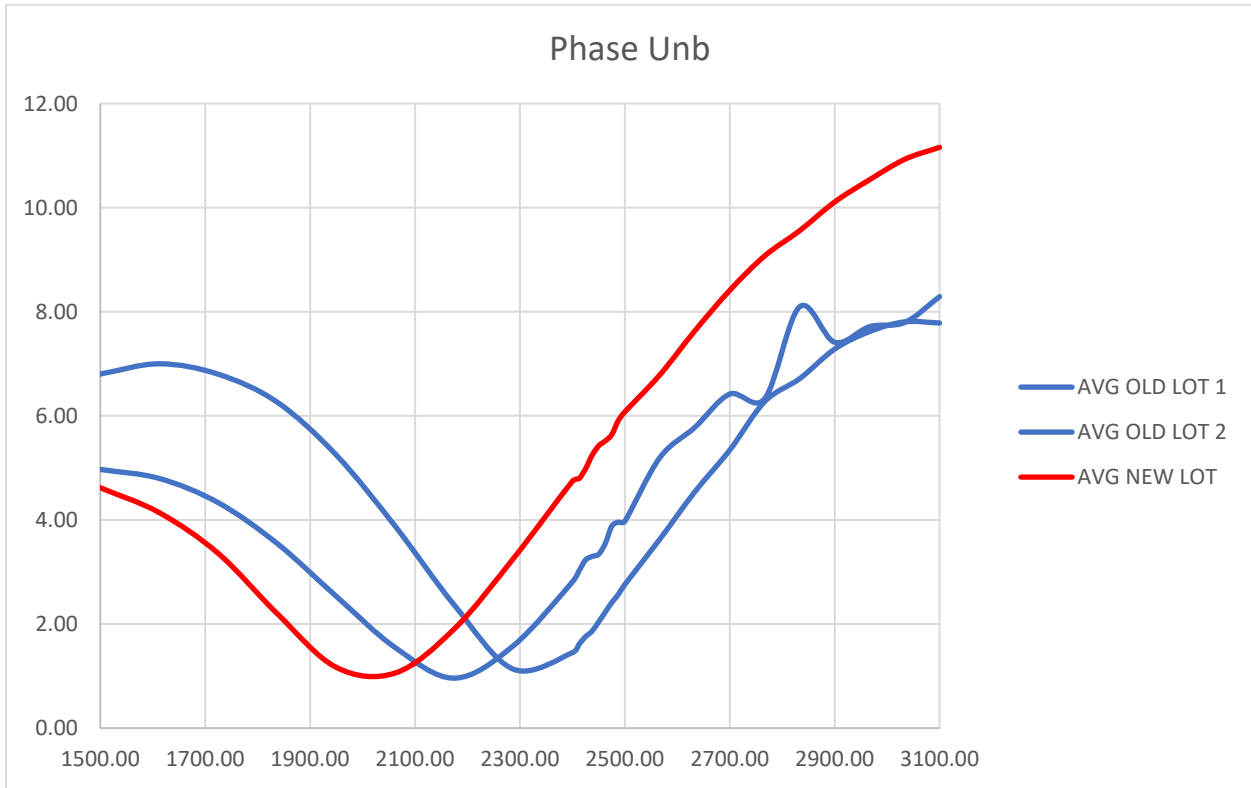
Code	Description	Code	Description
	New Material (Pb Free LTCC)		Typical
	Old Material (LTCC Containing Pb)		Specification

Note: Red is New material Blue are old lots. Green is spec

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APPLICATION NOTE

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