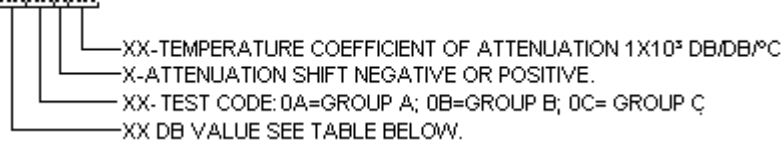


# TITLE: SPECIFICATION CONTROL DRAWING

PART IDENTIFIER: HRTXXXXXX



SHIFT (NEG)	DB VALUE	SHIFT (POS)	DB VALUE
-.003	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	.003	1, 3, 6
-.004	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	.005	1, 3, 6
-.005	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	.006	1
-.006	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	.007	1, 2, 3, 6
-.007	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	.008	6
-.009	1, 2, 3, 4, 5, 6		

**DESCRIPTION:** TEMPERATURE VARIABLE CHIP ATTENUATOR WITH HIGH RELIABILITY TESTING.

**NOTE:** SINGLE LOT AND DATE CODE AVAILABLE UPON REQUEST.

**ASSEMBLY DWG:** N/A

## 1.0 SPECIFICATIONS:

### 1.1 ELECTRICAL:

- 1.1.1 IMPEDANCE: 50 OHMS NOMINAL
- 1.1.2 OPERATING FREQUENCY RANGE: DC - 6GHZ.
- 1.1.3 ATTENUATION VALUE: SEE TABLE ABOVE.
- 1.1.4 ATTENUATION ACCURACY AT 25°C: ±0.5DB @ 1 GHZ.
- 1.1.5 VSWR: 1.30:1 MAX. @ 1GHZ.
- 1.1.6 INPUT POWER: NEGATIVE SHIFTING: 2 WATTS CW.  
POSITIVE SHIFTING: 0.25 WATTS CW.  
1.1.6.1 FULL RATED POWER TO 125°C, DERATED LINEARLY TO 0 WATTS AT 150°C.
- 1.1.7 TEMPERATURE COEFFICIENT OVER OPERATING TEMPERATURE RANGE:  
SEE TABLE ABOVE, TEMPERATURE COEFFICIENT TOLERANCE: ±0.001 DB/DB/°C.

### 1.2 MECHANICAL:

- 1.2.1 OUTLINE DWG: SEE SHEET 3.
- 1.2.2 WORKMANSHIP: PER MIL-PRF-55342.

### 1.3 ENVIRONMENTAL:

- 1.3.1 OPERATING TEMPERATURE RANGE: -55°C TO +150°C.

### 1.4 ELECTROSTATIC DISCHARGE CONTROL: PER MIL-STD-1686.

**2.0 UNIT MARKING:** DB VALUE (XX), DIRECTION OF SHIFT (N OR P) AND TCA SHIFT (X).  
LEGIBILITY AND PERMANENCY PER MIL-STD-130.

## 3.0 QUALITY ASSURANCE:

- 3.1 VERIFY 100% VISUAL PRE-CAP INSPECTION PERFORMED PER TP-8965.
- 3.2 PERFORM GROUP A, B AND/OR C TESTING AS INDICATED BY THE PART NUMBER PER TP-8965.
  - 3.2.1 GROUP A TESTING
    - 3.2.1.1 VISUAL AND MECHANICAL INSPECTION PER SHEET 3.
    - 3.2.1.2 INITIAL RF MEASUREMENTS – MEASURE AND RECORD VSWR @ 1 GHZ AND ATTENUATION AT DC (0 GHZ) AND 1.0 GHZ.
    - 3.2.1.3 THERMAL SHOCK – 10 CYCLES FROM -55°C TO +125°C.
    - 3.2.1.4 AFTER THERMAL SHOCK RF MEASUREMENTS - MEASURE AND RECORD VSWR @ 1 GHZ AND ATTENUATION AT DC (0 GHZ) AND 1.0 GHZ.
    - 3.2.1.5 BURN-IN – DURATION OF 168 HRS AT INPUT POWER SEE 1.1.6.
    - 3.2.1.6 SUB-GROUP 1 (3 SAMPLES)
      - 3.2.1.6.1 TCA MEASUREMENT - MEASURE AND RECORD ATTENUATION AT DC EVERY 20°C FROM -55°C TO +125°C PER 2.5.1 OF TP-8965.
      - 3.2.1.7.2 CALCULATE, USING LINEAR REGRESSION, THE SLOPE OF THE CURVE.

ENG		PUR		MFG		PLAN		SM	
CC				QA					
EMC TECHNOLOGY 8851 SW OLD KANSAS AVE. STUART, FL 34997			CAGE CODE # 24602					DWG #	1009705000
			CHANGE NOTICE		EN 04-E033			REV LVL	-
								SHEET	1 OF 3

CALCULATE TCA USING THE FOLLOWING FORMULA:

$$TCA = \frac{\text{SLOPE}}{\text{ATTENUATION @ 25}^\circ\text{C}}$$

3.3.1.7.3 ACCEPTANCE LIMITS: NOMINAL TCA +/-0.001 dB/dB/°C.

3.2.2 GROUP B TESTING (7 SAMPLES APPROVED FROM GROUP A).

3.2.2.1 SUB-GROUP 1 (3 SAMPLES)

3.2.2.1.1 LOW TEMPERATURE OPERATION

3.2.2.1.1.1 USE FINAL ELECTRICAL MEASUREMENTS FROM GROUP A.

3.2.2.1.1.2 DISSIPATE LOW POWER FOR A DURATION OF 45 +/-0 MINUTES.  
ALLOW TO STABILIZE AT 25°C FOR 24 HOURS.

3.2.2.1.2 AFTER LOW TEMPERATURE ELECTRICAL MEASUREMENTS - MEASURE AND  
RECORD VSWR @ 1 GHZ AND ATTENUATION AT DC (0 GHZ) AND 1.0 GHZ.

3.2.2.1.3 HIGH TEMPERATURE BAKE – +125°C +/- 5°C FOR 100 HRS THEN STABILIZE AT 25°C  
FOR 4 HRS.

3.2.2.1.3.1 VISUAL EXAMINATION - INSPECT FOR EVIDENCE OF MECHANICAL  
DAMAGE.

3.2.2.1.4 AFTER HIGH TEMPERATURE BAKE ELECTRICAL TEST - MEASURE AND RECORD  
VSWR @ 1 GHZ AND ATTENUATION AT DC (0 GHZ) AND 1.0 GHZ.

3.2.2.1.5 TERMINATION ADHESION - SOLDER A WIRE AND PULL WITH 15 GRAMS  
PERPENDICULAR TO AND AWAY FROM THE SURFACE AREA.

3.2.2.1.5.1 VISUAL INSPECTION – THERE SHALL BE NO SEPARATION OF  
MATERIAL.

3.2.2.1.6 TERMINATION SOLDERABILITY IMMERSE EACH SAMPLE 5 SECONDS IN A SOLDER  
POT HELD AT 220°C +/- 5°C USING 60/40 OR 63/37 TIN-LEAD COMPOSITION.

3.2.2.2 SUB-GROUP 2 (4 SAMPLES)

3.2.2.2.1 INITIAL RF MEASUREMENTS - USE FINAL ELECTRICAL MEASUREMENTS FROM  
GROUP A.

3.2.2.2.2 LIFE TEST – OPERATE SAMPLES UNITS FOR 1000 HRS AT 70°C AT INPUT POWER  
PER 1.1.6. ELECTRICAL MEASUREMENTS SHALL BE MADE AT 250 +/-0 HRS, 500  
+48/-0 HRS, AND 1000 +/-0 HRS.

3.2.2.2.3 FINAL RF MEASUREMENTS - MEASURE AND RECORD VSWR @ 1 GHZ AND  
ATTENUATION AT DC (0 GHZ) AND 1.0 GHZ.

3.2.3 GROUP C (QCI TESTING 4 SAMPLES APPROVED FROM GROUP A).

3.2.3.1 LOAD LIFE TEST – BURN-IN UNITS AT 70°C WITH INPUT POWER (SEE 1.1.6) FOR A DURATION  
OF 1000 HOURS (1½ HOURS ON, ½ HOUR OFF). MEASURE AND RECORD ELECTRICALS AT 0,  
250, 500, AND 1000 HOURS.

3.2.3.2 AFTER LOAD LIFE RF MEASUREMENTS – MEASURE AND RECORD VSWR AND ATTENUATION  
AT 1 GHZ AT 25°C. TEST ACCEPTABLE LIMITS PER 4.2.1 OF TP-8965.

3.4 TEST DATA REQUIREMENTS:

3.4.1 TEST DATA REQUIRED FOR CUSTOMER - SEE PARAGRAPH 5.0 OF TP-8965.

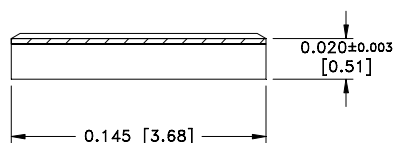
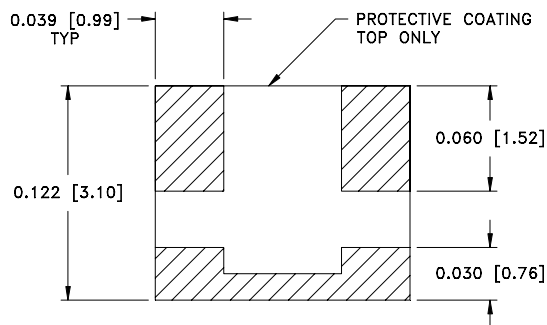
3.4.2 DATA RETENTION - 24 MONTHS.

3.4.3 TEST SAMPLES REQUIRED FOR CUSTOMER - SEE PARAGRAPH 5.0 OF TP-8965.

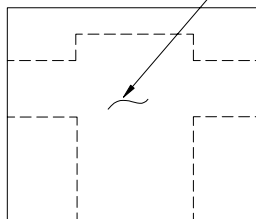
4.0 PACKAGING: STANDARD PACK PER MC0023. (SERIALIZED WAFFLE PACK)

EMC TECHNOLOGY 8851 SW OLD KANSAS AVE. STUART, FL 34997	CAGE CODE # 24602		DWG #	1009705000
	CHANGE NOTICE	EN 04-E033	REV LVL	-
			SHEET	2 OF 3

PART NO.	U.S. PATENT NO. 5332981
HRTXXXXXX	



UNITS MARKED ON THIS SURFACE



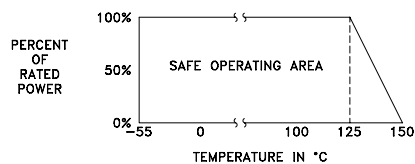
**MECHANICAL SPECIFICATIONS:**

SUBSTRATE:  
MATERIAL - ALUMINA, MIL-I-10.  
TERMINAL:  
MATERIAL - THICK FILM, NICKEL BARRIER,  
SOLDER PLATED.  
RESISTIVE ELEMENT:  
MATERIAL - THICK FILM.

METRIC EQUIVALENTS GIVEN IN [mm]  
FOR REFERENCE INFORMATION ONLY



**POWER RATING AND DERATING**



<p>8851 SW OLD KANSAS AVE STUART, FL 34997 PHONE NO. (772)286-9300 FAX NO. (772)283-5286</p>	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF EMC TECHNOLOGY INC AND SHALL NOT BE DUPLICATED OR USED AS BASIS FOR THE MANUFACTURE OR SALE OF PARTS OR DEVICES WITHOUT PERMISSION.						
	TOLERANCES	CAGE CODE	SCALE	DRAWN BY	CHECKED BY	APPROVED BY		
	FRACT --- ANG --- XX --- XXX ±0.005 XXXX ---	24602	16:1	JG				
	REV ---	CHANGE NOTICE	DRAWING NO		SHEET			
		EN 03-266	1009705000		3 OF 3			