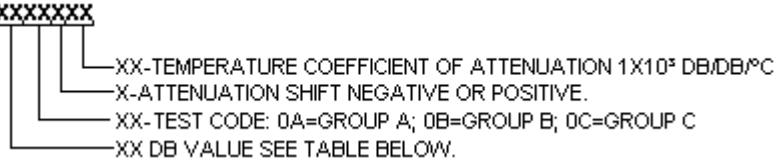


TITLE: SPECIFICATION CONTROL DRAWING

PART IDENTIFIER: HRMXXXXXX



SHIFT (NEG)	DB VALUE	FREQUENCY RANGE
-003	1, 2, 3, 4, 5, 6, 8	DC – 18 GHZ
-004	1, 2, 3, 4, 6	
-005	1, 2, 3, 4, 5, 6	
-006	2, 3, 4	DC – 12.4 GHZ
-007	2, 3, 4, 5, 6	
-009	3, 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 - 12.4GHZ.
 - 1.1.3 ATTENUATION VALUES AVAILABLE: 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: 200 MILLIWATTS 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 (X), DIRECTION OF SHIFT (N) 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.
 - 3.2.1.6.2 CALCULATE, USING LINEAR REGRESSION, THE SLOPE OF THE CURVE.

ENG		PUR		MFG		PLAN		SM	
CC				QA					
EMC TECHNOLOGY		CAGE CODE # 24602				DWG #	1009785000		
8851 SW OLD KANSAS AVE.		CHANGE NOTICE	EN 04-E033			REV LVL	-		
STUART, FL 34997						SHEET	1 OF 3		

CALCULATE TCA USING THE FOLLOWING FORMULA:

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

3.3.1.6.3 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 IMMERSIVE 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 +/-48/-0 HRS, 500 +/-48/-0 HRS, AND 1000 +/-48/-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.

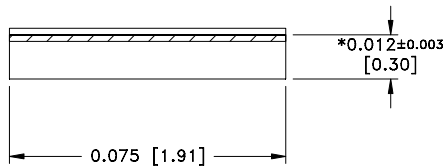
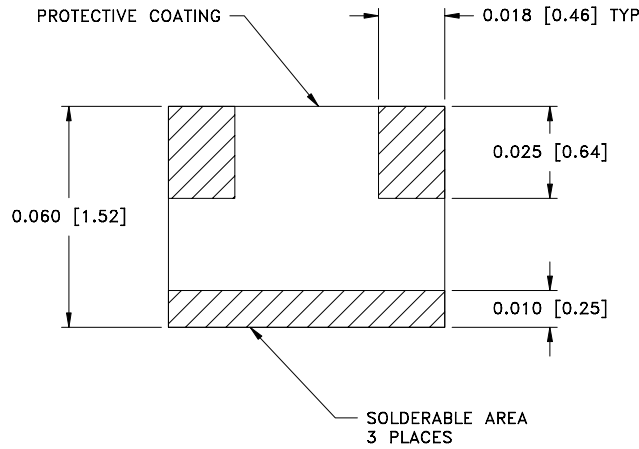
4.0 PACKAGING: STANDARD PACK PER MC0023. (SERIALIZED WAFFLE PACK)

EMC TECHNOLOGY 8851 SW OLD KANSAS AVE. STUART, FL 34997	CAGE CODE # 24602		DWG #	1009785000
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			SHEET	2 OF 3

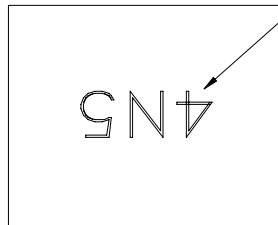
PART ID REF

HRMXXXXXX

U.S. PATENT NO. 5332981



UNITS MARKED ON THIS SURFACE VALUE SHOWN TO REPRESENT ORIENTATION



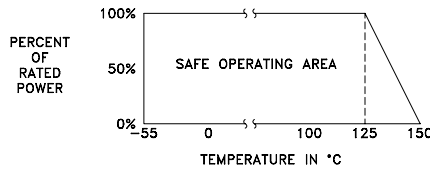
MECHANICAL SPECIFICATIONS:

- SUBSTRATE:
 - MATERIAL - ALUMINA 96%, 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



EMC Technology
 8851 SW OLD KANSAS AVE
 STUART, FL 34997
 PHONE NO. (772)286-9300
 FAX NO. (772)283-5286

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES

FRACT ---
 ANG ---
 XX ---
 XXX ±0.005
 XXXX ---

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CAGE CODE 24602	SCALE 32:1	DRAWN BY JG	CHECKED BY	APPROVED BY
REV -	CHANGE NOTICE EN 03-268	DRAWING NO 1009785000	SHEET 3 OF 3	