



TEST REPORT
ON
2 TO 14 GHz
SINGLE POLE TWELVE THROW
ABSORPTIVE / NON-REFLECTIVE SWITCH MODULE

AMC MODEL No:
MSN-12DT-05-DEC-MP
OPTION 214

Serial Numbers: 12MS91001 AND 12MS91002

DESIGNED
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REPORTED
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October 20, 2004

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ISO9001 : 2000 CERTIFIED

Handwritten signatures and initials:
DRH
JEM
PW
MJS
AA
SET

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SINGLE POLE TWELVE THROW ABSORPTIVE / NON-REFLECTIVE SWITCH MODULE AMC MODEL No: MSN-12DT-05-DEC-MP OPTION 214

FEATURES:

- **2 TO 14 GHz BROADBAND FREQUENCY RANGE**
- **LOW INSERTION LOSS**
- **HIGH ISOLATION**
- **4 BIT BINARY CONTROL**
- **INTEGRAL TTL DRIVER**

| LOGIC TABLE | | | | |
|----------------|----|----|----|----------------------|
| TERMINAL LEVEL | | | | OUTPUT / SWITCH (ON) |
| E1 | E2 | E3 | E4 | RF |
| 0 | 0 | 0 | 0 | J1 |
| 1 | 0 | 0 | 0 | J2 |
| 0 | 1 | 0 | 0 | J3 |
| 1 | 1 | 0 | 0 | J4 |
| 0 | 0 | 1 | 0 | J5 |
| 1 | 0 | 1 | 0 | J6 |
| 0 | 0 | 0 | 1 | J7 |
| 1 | 0 | 0 | 1 | J8 |
| 0 | 1 | 0 | 1 | J9 |
| 1 | 1 | 0 | 1 | J10 |
| 0 | 0 | 1 | 1 | J11 |
| 1 | 0 | 1 | 1 | J12 |

SPECIFICATIONS:

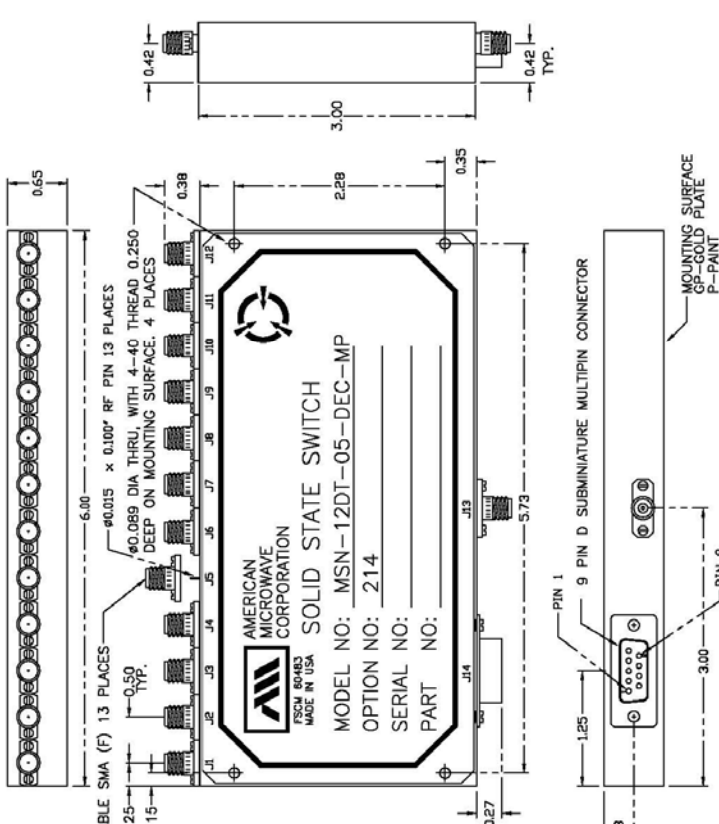
- | | |
|---|--|
| <ul style="list-style-type: none"> ● FREQUENCY ● INSERTION LOSS ● ISOLATION ● VSWR ● SPEED ● POWER INPUT ● SURVIVAL POWER ● CONTROL ● POWER SUPPLY | <ul style="list-style-type: none"> ⋮ 2 TO 14 GHz ⋮ 5.5 dB MAXIMUM ⋮ 70 dB MINIMUM ⋮ 2.0:1 ⋮ RISE: 10 ns TYPICAL, 15 ns MAXIMUM ⋮ FALL: 10 ns TYPICAL, 15 ns MAXIMUM ⋮ DELAY ON: 75 ns TYPICAL, 150 ns MAXIMUM ⋮ DELAY OFF: 75 ns TYPICAL, 150 ns MAXIMUM ⋮ (CW)+20 dBm (STANDARD) ⋮ 1 WATT CW, 10 WATTS PEAK 1 usec ⋮ SEE LOGIC TABLE ⋮ +5V @ 600 mA MAXIMUM ⋮ -5V @ 200 mA MAXIMUM |
|---|--|

PRODUCT FEATURE

DESCRIPTION:
 AMC MODEL MSN-12DT-05-DEC-MP OPTION 214 IS A SINGLE POLE TWELVE THROW, ABSORPTIVE/NON-REFLECTIVE SWITCH MODULE WITH LOW INSERTION LOSS, HIGH ISOLATION, 4 BIT BINARY CONTROL AND INTEGRAL TTL DRIVER, DESIGNED FOR 2 GHz TO 14 GHz FREQUENCY RANGE.

SPECIFICATIONS:

- FREQUENCY: 2 GHz TO 14 GHz
- INSERTION LOSS: 5.5dB MAXIMUM
- ISOLATION: 70dB MINIMUM
- VSWR: IN/OUT, OUT/OFF: 2.0:1
- SPEED: RISE: 10ns TYPICAL, 15ns MAXIMUM
 FALL: 10ns TYPICAL, 15ns MAXIMUM
 DELAY ON: 75ns TYPICAL, 150ns MAXIMUM
 DELAY OFF: 75ns TYPICAL, 150ns MAXIMUM
- POWER INPUT: (CW)+20dBm (STANDARD)
- SURVIVAL POWER: 1 WATT CW, 10 WATTS PEAK 1 usec
- CONTROL: SEE LOGIC TABLE
- POWER SUPPLY: +5V @ 600 mA MAXIMUM
 -5V @ 200 mA MAXIMUM
- SIZE: 6.0" (L) x 3.0" (W) x 0.65" (H)
- WEIGHT: 15 OUNCES TYPICAL



REMOVABLE SMA (F) 13 PLACES
 #0.015 x 0.100" RF PIN 13 PLACES
 #0.089 DIA THRU, WITH 4-40 THREAD 0.250
 DEEP ON MOUNTING SURFACE. 4 PLACES
 0.38
 0.25
 0.15
 0.50 TYP.

AMERICAN MICROWAVE CORPORATION
 SOLID STATE SWITCH
 MODEL NO: MSN-12DT-05-DEC-MP
 OPTION NO: 214
 SERIAL NO:
 PART NO:

9 PIN D SUBMINIATURE MULTIPIN CONNECTOR
 MOUNTING SURFACE
 P-GOLD PLATE
 P-PAINT

DT=WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

LOGIC TABLE

| TERMINAL LEVEL | OUTPUT/STATE (DB) |
|----------------|-------------------|
| E1 E2 E3 E4 | OFF |
| L L L L | A |
| L L L L | B |
| L L L L | C |
| L L L L | D |
| L L L L | E |
| L L L L | F |
| L L L L | G |
| L L L L | H |
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| L L L L | 200 |

LOGIC L = LOW OR LOGIC H = HIGH OR

ENVIRONMENTAL RATINGS:

- TEMPERATURE: -55°C TO +85°C (OPERATING)
 -65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 2138 COND. B
- VIBRATION: MIL-STD-202F, METHOD 2040 COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

REVISIONS

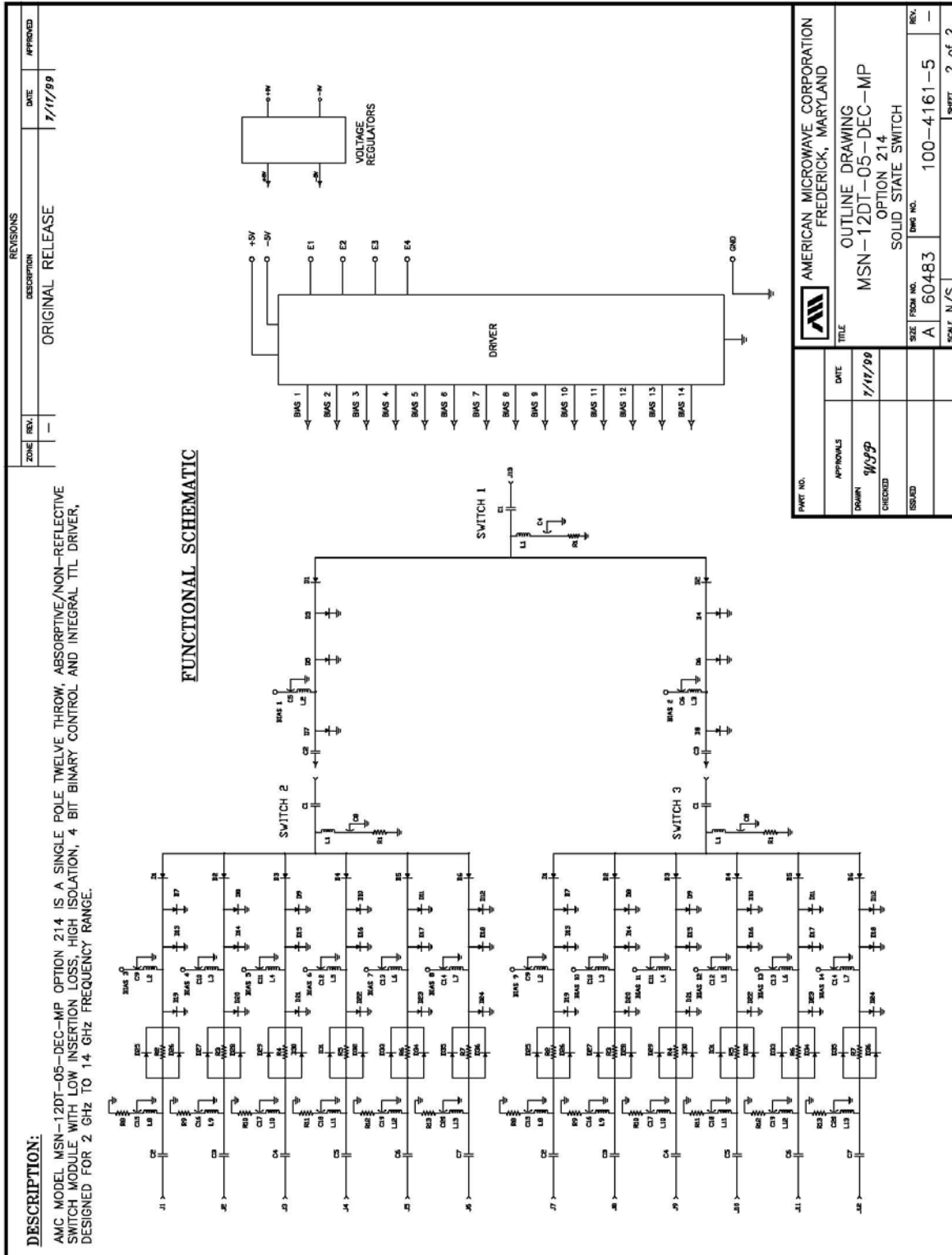
| ZONE | REV. | DESCRIPTION | DATE | APPROVED |
|------|------|------------------|---------|----------|
| | 1 | ORIGINAL RELEASE | 7/11/99 | |

AMERICAN MICROWAVE CORPORATION
 FREDERICK, MARYLAND

OUTLINE DRAWING
 MSN-12DT-05-DEC-MP
 OPTION 214
 SOLID STATE SWITCH

DATE: 7/11/99
 DRAWN: WJSP
 CHECKED:
 DESIGNED:
 SIZE FROM NO. A 60483
 DWG NO. 100-4161-5
 SCALE: N/S
 SHEET 1 OF 2

OUTLINE DRAWING



FINAL TEST DATA

FINAL TEST DATA SHEETS

FOR

AMC MODEL NUMBER

**MSN-12DT-05-DEC-MP
OPTION 214**

Serial Numbers:

12MS91001 THRU 12MS91002

FINAL TEST DATA

AMC MODEL NO: MSN-12DT-05-DEC-MP OPTION 214, SERIAL NUMBER: 12MS91001

FORM: 100-5109 11/1099



AMERICAN MICROWAVE CORPORATION

DATE: 12/15/99

FINAL TEST DATA
 ON
 MICROWAVE SWITCH

CUSTOMER: RAYTHEON SEGUNDO TECHNICIAN: R. Butler
 JOB NO: 907124E
 MODEL NO: MSN-12DT-05-DEC-MP OPTION NO: 214
 SERIAL NO: 12MS91001
 CURRENT DRAW: +5 VDC @ 600mA; -5 VDC @ 150mA FREQUENCY RANGE: 2.0 GHz - 14.0 GHz

| INSERTION LOSS LOGS @ 9GHz | INSERTION LOSS @ 14GHz | RETURN LOSS | | | | | |
|----------------------------------|---------------------------|-------------|------------|--------------|----------------|---------------|-----------------|
| | | INPUT dB | INPUT VSWR | OUTPUT ON dB | OUTPUT ON VSWR | OUTPUT OFF dB | OUTPUT OFF VSWR |
| 3.68dB | J13-J1 5.47dB | 11.59dB | 1.71 :1 | 13.90 dB | 1.50 :1 | 11.81 dB | 1.69 :1 |
| 3.48dB | J13-J2 5.04 dB | 11.04dB | 1.77 :1 | 13.41 dB | 1.54 :1 | 13.75 dB | 1.51 :1 |
| 3.36dB | J13-J3 5.21 dB | 10.62dB | 1.83 :1 | 11.78 dB | 1.69 :1 | 15.35 dB | 1.41 :1 |
| 3.44dB | J13-J4 5.21 dB | 10.78dB | 1.81 :1 | 11.48 dB | 1.72 :1 | 14.95 dB | 1.43 :1 |
| 3.35dB | J13-J5 5.27 dB | 10.21 dB | 1.89 :1 | 10.62 dB | 1.83 :1 | 16.51 dB | 1.35 :1 |
| 3.65dB | J13-J6 5.94 dB | 10.22dB | 1.89 :1 | 10.87 dB | 1.80 :1 | 16.41 dB | 1.35 :1 |
| 3.29dB | J13-J7 4.62 dB | 12.46dB | 1.62 :1 | 14.70 dB | 1.45 :1 | 12.78 dB | 1.59 :1 |
| 3.27dB | J13-J8 4.57 dB | 11.86dB | 1.68 :1 | 11.87 dB | 1.68 :1 | 15.06 dB | 1.42 :1 |
| 3.37dB | J13-J9 4.77 dB | 10.03dB | 1.92 :1 | 10.64 dB | 1.83 :1 | 16.59 dB | 1.34 :1 |
| 3.21dB | J13-J10 4.62 dB | 10.42dB | 1.86 :1 | 11.22 dB | 1.75 :1 | 14.56 dB | 1.46 :1 |
| 3.30dB | J13-J11 4.54 dB | 12.07dB | 1.66 :1 | 12.54 dB | 1.61 :1 | 13.40 dB | 1.54 :1 |
| 3.78dB | J13-J12 5.53 dB | 11.52dB | 1.72 :1 | 12.93 dB | 1.58 :1 | 13.45 dB | 1.53 :1 |



AMERICAN MICROWAVE CORPORATION

| ISOLATION | SWITCHING SPEED | | | |
|-----------------|-----------------|-----------|-----------|-----------|
| | DELAY ON | RISE TIME | DELAY OFF | FALL TIME |
| J13-J1 > 65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J2 > 65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J3 > 65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J4 > 65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J5 > 65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J6 > 65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J7 > 65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J8 > 65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J9 > 65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J10 > 65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J11 > 65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J12 > 65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |

NOTE: Any additional test data on back

TESTED ON: 83508/8757A (MP)

TEST: E #30 RTS
 QA/QC: QA PA
 DATED: DEC 15 1999

FINAL TEST DATA

AMC MODEL NO: MSN-12DT-05-DEC-MP OPTION 214, SERIAL NUMBER: 12MS91002

FORM: 100-5109 11/1099



AMERICAN MICROWAVE CORPORATION

DATE: 12/15/99

FINAL TEST DATA
 ON
 MICROWAVE SWITCH

CUSTOMER: RAYTHEON SEGUNDO TECHNICIAN: R. Butler
 JOB NO: 907124E
 MODEL NO: MSN-12DT-05-DEC-MP OPTION NO: 214
 SERIAL NO: 12MS 91002
 CURRENT DRAW: +5 VDC @ mA; -5 VDC @ mA FREQUENCY RANGE: 2.0 GHz - 14.0 GHz

INSERTION LOSS @ 9 GHz

| INSERTION LOSS | RETURN LOSS | | | | | |
|----------------|-----------------|----------------|-----------------|----------------|-----------------|-----------------|
| | INPUT dB | INPUT VSWR | OUTPUT ON dB | OUTPUT ON VSWR | OUTPUT OFF dB | OUTPUT OFF VSWR |
| <i>4.8 dB</i> | <i>14.3 dB</i> | <i>1.47 :1</i> | <i>11.91 dB</i> | <i>1.62 :1</i> | <i>15.04 dB</i> | <i>1.43 :1</i> |
| <i>4.89 dB</i> | <i>13.80 dB</i> | <i>1.51 :1</i> | <i>10.61 dB</i> | <i>1.84 :1</i> | <i>22.37 dB</i> | <i>1.16 :1</i> |
| <i>4.95 dB</i> | <i>11.72 dB</i> | <i>1.70 :1</i> | <i>10.45 dB</i> | <i>1.86 :1</i> | <i>17.70 dB</i> | <i>1.30 :1</i> |
| <i>4.80 dB</i> | <i>12.47 dB</i> | <i>1.62 :1</i> | <i>10.95 dB</i> | <i>1.79 :1</i> | <i>19.32 dB</i> | <i>1.24 :1</i> |
| <i>5.11 dB</i> | <i>14.40 dB</i> | <i>1.47 :1</i> | <i>12.61 dB</i> | <i>1.61 :1</i> | <i>15.74 dB</i> | <i>1.37 :1</i> |
| <i>4.89 dB</i> | <i>13.46 dB</i> | <i>1.54 :1</i> | <i>10.91 dB</i> | <i>1.80 :1</i> | <i>14.64 dB</i> | <i>1.46 :1</i> |
| <i>4.95 dB</i> | <i>12.14 dB</i> | <i>1.66 :1</i> | <i>12.12 dB</i> | <i>1.66 :1</i> | <i>16.98 dB</i> | <i>1.33 :1</i> |
| <i>5.25 dB</i> | <i>11.55 dB</i> | <i>1.72 :1</i> | <i>12.24 dB</i> | <i>1.65 :1</i> | <i>13.36 dB</i> | <i>1.55 :1</i> |
| <i>4.70 dB</i> | <i>10.98 dB</i> | <i>1.79 :1</i> | <i>11.46 dB</i> | <i>1.73 :1</i> | <i>20.67 dB</i> | <i>1.20 :1</i> |
| <i>4.89 dB</i> | <i>10.91 dB</i> | <i>1.80 :1</i> | <i>11.85 dB</i> | <i>1.69 :1</i> | <i>14.22 dB</i> | <i>1.48 :1</i> |
| <i>5.45 dB</i> | <i>12.36 dB</i> | <i>1.64 :1</i> | <i>10.89 dB</i> | <i>1.80 :1</i> | <i>12.63 dB</i> | <i>1.61 :1</i> |
| <i>4.91 dB</i> | <i>12.25 dB</i> | <i>1.65 :1</i> | <i>12.50 dB</i> | <i>1.62 :1</i> | <i>13.10 dB</i> | <i>1.56 :1</i> |

DATED: 12/15/99



AMERICAN MICROWAVE CORPORATION

| ISOLATION | SWITCHING SPEED | | | |
|----------------|-----------------|-----------|-----------|-----------|
| | DELAY ON | RISE TIME | DELAY OFF | FALL TIME |
| J13-J1 >65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J2 >65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J3 >65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J4 >65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J5 >65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J6 >65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J7 >65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J8 >65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J9 >65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J10 >65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J11 >65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |
| J13-J12 >65 dB | < 150 nS | < 15 nS | < 150 nS | < 15 nS |

NOTE: Any additional test data on back

TESTED ON: 8350B/8757A (MP)

TEST: RB

QA/QC: 70 RA

DATED: 12/15/99