# **Environmental Test**

## **TEST UNIT AND EQUIPMENT:**

CU20045-KTW228A.v4 #767573 was tested between 11-Mar and 12-Mar, 2008.

Weiss WKL 100 Environmental Chamber serial 2200299200 calibrated 14-Aug-2007. Shaffner NSG435 ESD simulator PA0138 uncalibrated. Agilent E4402B spectrum analyser PA0193 calibrated 9-Nov-2007.

## **OPERATING CONDITION:**

RF emission and ESD: Vcc = 5V, GND = 0V, module operating in self-test mode. Temperature test: Vcc = 5.25V and 4.75V, module operating in self-test mode.

### **TEMPERATURE RANGE:**

The module was brought to temperature in the Weiss-Technik chamber in the sequence, and for the durations shown. Module was powered on in self-test mode, and visual quality of display observed.

| Temp | Duration | Observation   |  |  |  |  |
|------|----------|---------------|--|--|--|--|
| -40C | 2 hours  | Off, storage  |  |  |  |  |
| -40C | 1 hour   | Operating, OK |  |  |  |  |
| +85C | 16 hours | Off, storage  |  |  |  |  |
| +85C | 1 hour   | Operating,OK  |  |  |  |  |

## ELECTRO-STATIC DISCHARGE (Method IEC 6100-4-2):

The module was powered up in self-test mode on the test table. There it was exposed to contact and air discharges applied to the ribbon cable across the module face, the horizontal conductive plane under the module, and the vertical conductive plane.

| Observation                         | Contact Discharge | Air Discharge |  |  |
|-------------------------------------|-------------------|---------------|--|--|
| Lowest voltage discharged           | 3kV               | 8kV           |  |  |
| Temporary spurious ON/OFF of pixels | 7kV               | 14kV          |  |  |
| Module reset or lock-up             | None              | None          |  |  |
| Permanent damage                    | None              | None          |  |  |
| Highest voltage discharged          | 9kV               | 16kV          |  |  |

### CONDUCTED RF EMISSION TEST:

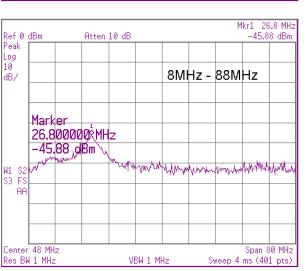
The 50-ohm input of the Agilent E4402B spectrum analyser was AC-coupled to the 5V supply of the module. While the module performed self-test, the spectra shown overleaf were taken:

| Start   | Stop     | Spectra         | Significant UUT peaks |  |  |  |
|---------|----------|-----------------|-----------------------|--|--|--|
| 50 kHz  | 2050 kHz | UUT             | -45dBm @290kHz        |  |  |  |
| 1 MHz   | 11 MHz   | UUT             | None                  |  |  |  |
| 8 MHz   | 88 MHz   | UUT             | -45dBm @26.8MHz       |  |  |  |
| 80 MHz  | 280 MHz  | UUT, background | None                  |  |  |  |
| 0.2 GHz | 3 GHz    | UUT             | None                  |  |  |  |

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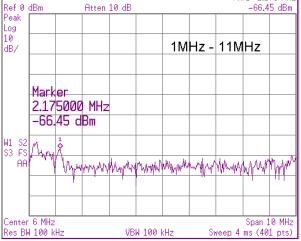
# **Environmental Test**

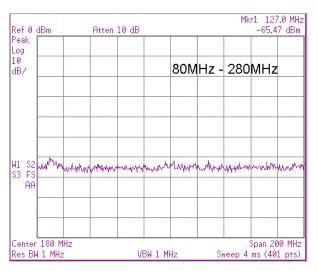
#### Mkr1 290 kHz -45.59 dBm Ref Ø dBm Atten 10 dB Peak Log 10 dB/ 50kHz - 2050kHz Marker 290.000 kHz -45.99 dBm W1 S2 S3 FS ÂÂ WW WALLAND WA MW W ΨV μĄ ΨW hall Center 1.05 MHz Span 2 MHz VBW 10 kHz Sweep 25.77 ms (401 pts) Res BW 10 kHz



| Ref 0             | dBm Atten    |           | 10 dB  |           |         | Mkr1 858 MHz<br>-60.34 dBm |        |       |         |        |
|-------------------|--------------|-----------|--------|-----------|---------|----------------------------|--------|-------|---------|--------|
| Peak<br>Log<br>10 |              |           |        |           |         |                            |        |       |         |        |
| dB/               |              |           |        |           |         | 0.20                       | GHz    | - 3G  | iHz     |        |
|                   |              |           |        |           |         |                            |        |       |         |        |
|                   | Spar<br>2.80 | 1<br>0000 | 000    | GHz       |         |                            |        |       |         |        |
|                   |              |           |        |           | prover  | mahala                     | wanter | man   | William | mm     |
| W1 S2<br>S3 FS    | Ada: cara d  |           | opus y | 1 v. 10 P |         |                            |        |       |         |        |
| AA                |              |           |        |           |         |                            |        |       |         |        |
|                   |              |           |        |           |         |                            |        |       |         |        |
| Center            | 1.6 GH       | lz        |        |           |         |                            |        |       | Span 2  | .8 GHz |
| Res Bk            | I 3 MHz      |           |        | VI        | BW 3 MF | łz                         | Sweep  | 4.667 | ms (40  | 1 pts) |

# CU20045-KTW228A





CONTACT

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## NORITAKE ITRON VFD MODULES

## CU20045-KTW228A