DATA SHEET

EMI and EMC TESTING

EMI and EMC Testing

The UNICOR/Federal Prison Industries Electronics and Environmental Test Laboratory provides **Electromagnetic Interference (EMI)** and **Electromagnetic Compatibility (EMC)** testing and qualification services to designers and manufacturers of defense, military, telecommunications and computer/electronics.

Electromagnetic compatibility or EMC is the ability of a product or component to operate reliably in its intended electromagnetic environment and to accept or emit radio-frequency disturbances within defined limits of the electromagnetic spectrum.

EMC testing generally is conducted in one or both of the following areas:

- Electromagnetic (EMI) testing to determine a product's ability to accept disturbances
- Emissions testing or EMI/RFI testing to determine the level of electromagnetic or radio-frequency disturbances a product produces

Our EMI testing services are specially designed to measure devices that use electrical power sources. We rigorously test your products to determine whether they generate excessive energy, are susceptible to excessive energy, and can sustain electrical currents at adequate and safe levels. We have significant experience in testing equipment that uses an electrical charge, including communications equipment, computers, and aerospace and military components and systems.

The laboratory provides a complete testing service for all aspects of the electromagnetic environment, including EMI and EMC testing and analysis, to the latest commercial, international, federal government and military standards.

The laboratory maintains an in-house program, allowing our staff to stay on the leading edge of test methodology, equipment and standards.

Electromagnetic and Electronics Testing Equipment

HIGH PERFORMANCE SPECTRUM ANALYZER: HEWLETT PACKARD MODEL HP-8566B

- Frequency range from 100 Hz to 22 GHz, variable in approximately 1% increments
- Frequency response:100 Hz to 2.5 GHz <± 0.6dB; 2 to 12.5 GHz ± 1.7 dB; 12.5 to 20 GHz, ± 2.2 dB; 20 to 22 GHz, ± 3.o dB
- Quick and accurate measurement of insertion loss, gain, return loss, SWR and power
- Frequency reference within 1 x 10-of final stab frequency in 30 minutes

TRIGGER

- Free run, line, video, external, continuous, and single
- Bandwidth selectivity: 60dB/2 dB ratio, shape, synchronously tuned, 4 or 5 pole filters, approximately Gaussian shape
- Video Bandwidth: 1Hz to 2 MHZ in a 1, 3, 10 sequence
- Test results on a Hewlett-Packard, HP-7440A, Graphics Plotter

SWEEP OSCILLATOR: HEWLETT PACKARD MODEL HP-8350B

- Used with several broad-band, straddle-band, and single-band plug-in units
- High output power with solid-state reliability
- Frequency range: 2 GHz to 18.6 GHz, leveled output power, with a CW and frequency accuracy of ±20 MHZ
- Residual FM: 30 kHz peak, 10 Hz -10 kHz bandwidth
- Power variation ±0.9 dB at maximum specified power

MICROWAVE AMPLIFIER: HEWLETT PACKARD MODEL HP-8349B

- Delivers increased microwave power performance across a 2 GHz to 20 GHz frequency range. Provides 100mW (±20dB) of unleveled output power from 2 to 18.6 GHz
- Offers one of the broadest operating bandwidths available from a solid state power amplifier

AMPLIFIER: HEWLETT PACKARD MODEL HP-8447D

- Provides low-noise, high-gain, low-distortion amplification
- Used to improve the sensitivity of counters, spectrum analyzers, RF voltmeters, EMI meters, and other devices
- Frequency range: 0.1 to 1.3 GHz
- Gain: (mean per channel) >26dB Noise Figure <8.5 dB
- Harmonic Distortion: 30dB for 0 dBm output
- Reverse Isolation: >40dB

Our EMI and EMC testing equipment is all NIST calibrated and traceable.

DIGITAL OSCILLOSCOPE: HEWLETT PACKARD MODEL HP-54100D

- Innovative, state-of-the-art, general purpose oscilloscope for digital design and testing
- Measurement performance: 350 pico-second rise time
- Stable triggering on pulses 1 nanosecond wide, 100 pico-second/division time base, and 40 mega sample/second digitizing rate
- Stability: 0.1 parts per million, with 0.002% time base linearity, 50 pico-second aperture jitter, and 10 pico-second resolution
- Channel to channel skew calibration for accurate measurement of time intervals at probe tips

TIME DOMAIN REFLECTOMETER (TDR): TEKTRONIX MODEL 1502

- Uses pulses to test cables; provides visual display of cable characteristics
- Calibrated distance controls to examine up to 100 feet of cable with segments as small as one foot displayed horizontally across 10-division CRT screen
- Low-loss cables as long as 2000 feet may be examined at 100 feet per division or 200 feet per division
- Three-digit, direct reading dial indicates the distance to any cable discontinuity
- Low noise operation with an accuracy rating of ±3%

TRACKING GENERATOR: HEWLETT PACKARD MODEL 8444A, OPTION 059

- Functions as sweep signal for sweep frequency testing of components
- Accurately tracks the frequency to which the analyzer is tuned
- Calibrated frequency and amplitude measurements can be made over the entire frequency range
- Logarithmic and linear scaling allow display of amplitude in dBm and voltage, respectively

SYNTHESIZER/FUNCTION GENERATOR: HEWLETT PACKARD MODEL 3325A

- 1 Hz to 20 MHZ high-performance, versatile synthesizer/function generator
- Precision frequency reference determines frequency accuracy; can be set with a resolution of 1 Hz; up to -65 dB harmonic and -70 dB spurious levels for precision measurements
- Precise control of phase of output signal to ± 719.9 degrees with 0.1 degree resolution
- Multiple units can be locked together for multi-phase applications
- Precision square-waves to 11 MHZ have 20 nano-second rise times with synthesizer accuracy and precision
- Triangle and ramp wave shapes

More detailed information on the UNICOR/Federal Prison Industries Electronics and Environmental Test Laboratory is available at: http://www.unicor.gov/electronics/elecenvirtesting.cfm

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