

Handheld Spectrum Analyzers  
Models 2650 and 2658



Features and Benefits

- Channel power measurement
- Adjacent channel power measurement
- Occupied bandwidth measurement
- Electric field strength measurement (with optional dipole antennas)
- Magnetic field strength measurement (with optional magnetic field probe)
- Min/Max hold
- Average and overwrite mode
- Marker measurement
- Switchable 50 or 75 ohm input impedance
- Peak search
- Auto tuning
- Auto range
- Save/Load
- Hard copy of display (with optional printer accessory)
- cUL approved

The 2650 and 2658 are high-performance handheld spectrum analyzers providing excellent performance and functions perfect for many different applications. It is a compact, lightweight and cost-effective unit that is ideal for testing W-CDMA, CDMA, GSM, PDC, PHS, Wireless LAN and Bluetooth systems.

Many different accessories are available for use with the 2650 and 2658 spectrum analyzers, which may be necessary for your application. These accessories include a wide selection of dipole antennas, a magnetic field probe, printer, PC software, and coaxial cable and adapter kits.

| Model           | 2650             | 2658             |
|-----------------|------------------|------------------|
| Frequency Range | 50 kHz - 3.3 GHz | 50 kHz - 8.5 GHz |

Specifications

| Specifications           |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Section        |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Frequency Range          | 50 kHz to 3.3 GHz (2650)<br>50 kHz to 8.5 GHz (2658)                                                                                                                                                                                                                                                                                                                                                                                                          |
| Center Frequency         |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Setting resolution       | 100 kHz                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Accuracy                 | within $\pm(30+20T)$ kHz $\pm 1$ dot T: Sweep time(s)<br>(frequency span: 200 kHz to 10 MHz, RBW: 30 kHz, $23\pm 5^{\circ}\text{C}$ )<br>within $\pm(100+700T)$ kHz $\pm 1$ dot T: Sweep time(s) (2650)<br>(frequency span: 20 MHz to 3.3 GHz (2650), RBW: 100 kHz, $23\pm 5^{\circ}\text{C}$ )<br>within $\pm(60+300T)$ kHz $\pm 1$ dot T: Sweep time(s) (2658)<br>(frequency span:20 MHz to 8.5 GHz (Model 2658), RBW: 100 kHz, $23\pm 5^{\circ}\text{C}$ ) |
| RBW frequency error      | within $\pm 6\%$ of RBW (RBW: 3 kHz, 30 kHz)<br>within $\pm 30\%$ of RBW (RBW: 100 kHz to 3 MHz)                                                                                                                                                                                                                                                                                                                                                              |
| Frequency Span           |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Setting range            | 0 Hz(zero span), 200 kHz to 2 GHz (2650) (1-2-5step) or<br>200 kHz to 5 GHz (2658) (1-2-5step),<br>and 3.3 GHz (full span/ 2650) or 8.5 GHz (full span/ 2658)                                                                                                                                                                                                                                                                                                 |
| Accuracy                 | within $\pm 3\%\pm 20T$ kHz $\pm 1$ dot<br>(frequency span: 200 kHz to 10 MHz, $23\pm 5^{\circ}\text{C}$ )<br>within $\pm 3\%\pm 200T$ kHz $\pm 1$ dot (frequency span:<br>20 MHz to 3.3 GHz (2650), 20 MHz to 8.5 GHz (2658)<br>$23\pm 5^{\circ}\text{C}$ ) T: Sweep time(s)                                                                                                                                                                                 |
| Display resolution       | Frequency span/250<br>Frequency span/1000 (only measurement by RS-232C communication)                                                                                                                                                                                                                                                                                                                                                                         |
| Display dot number       | 251 dots, 1001 dots (only measurement by RS-232C communication)<br>(The unit displays data in 251 horizontal<br>dots, but it internally captures the trace in 1001 dots)                                                                                                                                                                                                                                                                                      |
| Resolution bandwidth     | 3 dB bandwidth                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Setting range            | 3 kHz to 3 MHz(1-3step) and AUTO                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Accuracy                 | within $\pm 20\%$                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Selectivity              | 1:12 (typical, 3 dB : 60 dB)                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Video bandwidth          | 100Hz to 1MHz(1-3step), and AUTO                                                                                                                                                                                                                                                                                                                                                                                                                              |
| SSB phase noise          | -90 dBc/Hz (typical, 100 kHz offset, RBW: 3 kHz,<br>VBW: 100 Hz, Sweep time: 0.3s)                                                                                                                                                                                                                                                                                                                                                                            |
| Spurious response        | less than -60 dBc                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Harmonics                | less than -40 dBc (100 MHz to 3.3GHz/2650),<br>(100 MHz to 8.5 GHz/2658)                                                                                                                                                                                                                                                                                                                                                                                      |
| Amplitude Section        |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Reference level          |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Setting range            | + 10 to -60 dBm (1 dB step)                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Accuracy                 | within $\pm 0.8\text{ dB}\pm 1$ dot, (center frequency: 100 MHz,<br>RBW: 3 MHz, VBW: 1 MHz, ATT: 0 dB, $23\pm 5^{\circ}\text{C}$ )<br>dBm, dBV, dBmV, dB $\mu$ V, dB $\mu$ V/m, dB $\mu$ A/m                                                                                                                                                                                                                                                                  |
| Unit                     | (dB $\mu$ V/m and dB $\mu$ A/m using the measuring function)                                                                                                                                                                                                                                                                                                                                                                                                  |
| Average noise level      | -110 dBm (typical, center frequency: 100 MHz,<br>RBW: 3 kHz, VBW: 100 Hz)                                                                                                                                                                                                                                                                                                                                                                                     |
| Frequency Characteristic | within $\pm 2.0\text{ dB}\pm 1$ dot (100 kHz to 100 MHz)<br>within $\pm 1.0\text{ dB}\pm 1$ dot (100 MHz to 3.3 GHz/2650),<br>(100 MHz to 8.5 GHz/2658)                                                                                                                                                                                                                                                                                                       |
| Input impedance          | 50 $\Omega$                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Input VSWR               | less than 2.0                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Input Attenuator         |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Operating range          | 0 to 25 dB (1 dB step), coupled with reference level                                                                                                                                                                                                                                                                                                                                                                                                          |
| Switching error          | within $\pm 0.6\text{ dB}$                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| RBW switching error      | within $\pm 0.6\text{ dB}$                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Display dot number       | 200 dots                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Display Scale            |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Scale                    | 10 dB/div, 2 dB/div                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Accuracy                 | within $\pm 0.8\text{ dB}/10\text{ dB}\pm 1$ dot,<br>within $\pm 0.2\text{ dB}/2\text{ dB}\pm 1$ dot,<br>within $\pm 1.6\text{ dB}/70\text{ dB}\pm 1$ dot                                                                                                                                                                                                                                                                                                     |
| Input damage level       | +23 dBm(CW average power), 25 VDC                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Sweep Section           |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sweep time              |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Setting range           | 10 ms to 30 s (1-3 step, frequency span: 0 to 2 GHz) and AUTO,<br>30 ms to 30 s (1-3 step, frequency span: full span) and AUTO (2650)<br>30 ms to 30 s (1-3 step, frequency span: 5 GHz) and AUTO (2658)                                                                                                                                                                                                                                         |
| Accuracy                | within $\pm 0.1\%\pm 1$ dot (frequency span: 0 to 2 GHz) (2650),<br>within $\pm 0.1\%\pm 1$ dot (frequency span: 0 to 5 GHz) (2658),<br>within $\pm 1.5\%\pm 1$ dot (frequency span: full span) (2650),<br>within $\pm 2.5\%\pm 1$ dot (frequency span: full span) (2658)                                                                                                                                                                        |
| Trigger mode            | AUTO(frequency span: zero span)                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Detection mode          | Positive peak, Negative peak, Sample (When sweep time is 10 ms<br>or 30 ms, only Sample can be set)                                                                                                                                                                                                                                                                                                                                              |
| Functions               |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Marker                  | NORM: displays frequency (7 digits max) and level (4 digits max) at<br>marker point.<br>DELTA: displays differential frequency and level between 2 markers.                                                                                                                                                                                                                                                                                      |
| Peak search             | NORM: searches a peak point within 10 div.<br>Available NEXT peak (10 max).<br>ZONE: searches a peak point within a zone designated by<br>center and width. Marker moves to a peak point each sweep.                                                                                                                                                                                                                                             |
| Calculation             | NORM, MAX HOLD, MIN HOLD, AVERAGE, OVER WRITE<br>MAX/MIN HOLD: 2 to 1024 times, AVERAGE: 2 to 256                                                                                                                                                                                                                                                                                                                                                |
| Measuring               | Channel power, Adjacent channel leakage power, Occupied frequency<br>bandwidth, Electric field strength (needs antenna), Magnetic field strength<br>(needs optional magnetic field probe) measurement.                                                                                                                                                                                                                                           |
| AUTO tuning             | When pushing AUTO TUNE key, the maximum level spectrum within<br>3.3 GHz (2650), 8.5 GHz (2658) bandwidth is adjusted to center,<br>and reference level, RBW,<br>VBW and sweep time are adjusted to optimum values.                                                                                                                                                                                                                              |
| Save/Load               |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Save                    | Saves 100 traces and 100 setups                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Load                    | Loads 1 trace and 1 setup                                                                                                                                                                                                                                                                                                                                                                                                                        |
| General                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Input connector         | SMA(I)                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Communication Interface | RS-232C                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Baud rate               | 2400 to 38400 bps                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Hard copy               | Allows direct hard copy with an optional printer.                                                                                                                                                                                                                                                                                                                                                                                                |
| Display                 | LCD                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Backlight               | CFL backlight                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Resolution              | 240 (V) x 320 (H) dots                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Battery                 | Ni-MH battery (optional)                                                                                                                                                                                                                                                                                                                                                                                                                         |
| External DC source      | DC jack, +4.75 to +5.25 VDC/4 A                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Operating temperature   | 0 to 40 $^{\circ}\text{C}$ (Guaranteed at $23\pm 10^{\circ}\text{C}$ , without soft carrying case)                                                                                                                                                                                                                                                                                                                                               |
| Operating humidity      | less than 40 $^{\circ}\text{C}/80\%$ RH(Guaranteed at less than 33 $^{\circ}\text{C} /70\%$ RH,<br>without soft carrying case)                                                                                                                                                                                                                                                                                                                   |
| Storage temperature     | -20 to 60 $^{\circ}\text{C}$ , less than 60 $^{\circ}\text{C}/70\%$ RH                                                                                                                                                                                                                                                                                                                                                                           |
| Dimensions              | 162 (W) $\times$ 70 (H) $\times$ 260 (D) mm (exclude projections and stand)                                                                                                                                                                                                                                                                                                                                                                      |
| Weight                  | approx. 1.8 kg (include battery), approx. 1.5 kg (without battery)                                                                                                                                                                                                                                                                                                                                                                               |
| Two Year Warranty       |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Supplied Accessories    | AC adapter (BC 2650), Soft carrying case (LC 2650), Accessory pouch,<br>Operating manual, Ni-MH Battery (BP 2650)                                                                                                                                                                                                                                                                                                                                |
| Optional Accessories:   | Dipole antennas (AN 301,AN 302, AN 303,AN 304, AN 305,AN 306),<br>Magnetic field probe (PR 26M) with a dedicated double shielded coaxial<br>cable, PC software (AK 2650), Printer (PT 2650) with AC adapter. 4pcs<br>of AA batteries, and roll paper, Roll paper refill (PX 2650) for optional<br>printer PT 2650 (10 rolls), 1 GHz coaxial adapter kit for RF test instru-<br>ments (CT 2701), Deluxe spectrum accessory kits (CC265 and CC560) |

## Данный компонент на территории Российской Федерации

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<http://moschip.ru/get-element>

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В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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