

IWATSU FUNCTION GENERATORS



SG-4105 / SG-4115

- Employing high frequency stability and low distortion DDS
- Easy operation
- 10ppm (SG-4115), 50ppm (SG-4105) frequency stability
- 2 channel outputs and arbitrary waveform function
- Chassis and signal ground are isolated up to 42Vp-p.
- AM, FM, PM, FSK, PSK, PWM modulations are available. (SG-4115)
- Both GP-IB and RS-232 come with as standard.
- Output 50mVp-p to 10Vp-p (100mVp-p to 20Vp-p output open), Offset voltage range +10V to -10V (output open)
- Linear / Log SWEEP, BURST, DUTY control function
- Useful CH COPY function (SG-4115)

| Function Generators 4115/4105 | | | |
|-------------------------------|--|--|---|
| Model | SG-4115 | SG-4105 | |
| Output waveform | Sine wave, Square wave, Pulsewave, Triangle wave, Ramp wave, Gaussian noise, DC output, Arbitrary waveform | Sine wave, Square wave, Pulsewave, Triangle wave, Ramp wave, DC output | |
| Output channels | 2 | 1 | |
| Isolation | 42Vp-p from GND | - | |
| Output impedance | 50 fixed | | |
| Frequency | Range | Sine, Square: 10mHz~15MHz Arbitrary: 10mHz~1.6MHz Others: 10mHz~100kHz (without NOISE, DC) | Sine, Square: 10mHz~15MHz Others: 10mHz~100kHz (without DC) |
| | SLOW mode (Any wave) | 1mHz~100kHz | - |
| | Accuracy | ±10 ppm | ±50 ppm |
| | Resolution SLOW mode (Any wave) | 10 mHz or 9 digits 1 mHz or 9 digits | 10 mHz or 5 digits — |
| Amplitude | Range | 50 mVp-p to 10 Vp-p 100 mVp-p to 20 Vp-p (Open) | |
| | Accuracy (Sine 1kHz) | ±1 % | |
| | Resolution | 0.1 mV or 3 digits | |
| | Flatness (Reference to 1kHz sine wave) | Sine ±1% ~100kHz, ±2% Over 100kHz~1MHz, ±3% Over 1MHz~15MHz Square ±3% ~100kHz, ±5% Over 100kHz~15MHz (SWEEP off for SG-4115) Pulse, Triangle ±5%, SLOW mode ±5% (Any waveform) | |
| Mode | CONT, TRIG, GATE | | |
| Offset | Range | ±5V (Waveform + DC offset Less than 5.025V) | |
| | Resolution | 1mV or 3 digits | |
| | Accuracy | ±1% setting value ± 5mV (at DC output) | |
| Duty | Square wave | 20~80% (Less than 5MHz) 40~60% (5MHz or more) | |
| | Ramp, Pulse | 0~100% | |
| Sine wave spectral purity | Harmonic distortion at 10Vp-p | ~100kHz -50dBc, Over 100kHz~1MHz -45dBc, Over 1MHz~15MHz -35dBc | *dBc: Respect to carrier signal |
| | Spurious at 10Vp-p | 100kHz~1MHz -60dBc Over 1MHz~5MHz -50dBc Over 5MHz~15MHz -40dBc | 100kHz~1MHz -60dBc |
| | Total Harmonic Distortion | 0.10% at 1Vp-p or more, less than 100kHz 0.30% at less than 1Vp-p, 100kHz | |

| | | | |
|------------------------------|---|--|--|
| Step response | Overshoot | Square 2% (less than 1MHz) Pulse 2% (1µs or more FWHM) *Full Width at Half Maximum | |
| | Rise, Fall time (10%~90%) | Square 20ns | |
| | | Pulse 20ns | Pulse 300ns |
| SWEEP | Curve | Linear / Log | |
| | Type | CONTINUOUS: Oscillation continues at STOP frequency | |
| | | STOP: Oscillation stops after STOP frequency | |
| | Mode | CONT, GATE, TRIG | |
| | SWEEP TIME | 1ms~500s | |
| Sync out | SWEEP SYNC, SWEEP MARKER | | |
| BURST | Number | 65536 | |
| | Mode | CONT, TRIG Selectable ON counts or OFF counts | |
| PHASE | Range | ±359.9 | |
| | Resolution | 0.1 | |
| | Function | Start and Stop phase of TRIG,GATE, SWEEP, BURST mode.Phase between 2Channel signals. | Start and Stop phase of TRIG, GATE, SWEEP, BURST mode. |
| Internal Modulation | Mode | AM, FM, PM, PWM, FSK, PSK | - |
| | Modulation waveform | Any waveforms except DC | - |
| | Modulation bandwidth AM | Sine, Square, ARB ~1MHz Triangle, Ramp, Pulse ~100kHz Noise Fixed | - |
| | | FM,PM,PWM, FSK,PSK SLOW mode | ~100kHz Any modulation ~100kHz |
| | Depth or deviation | AM: Depth 0~120% FM: Deviation 10mHz ~7.5MHz (SLOW mode: 1mHz ~100kHz) PM, PSK: Phase ±359.9 PWM,,: Duty 1.0~99.0% FSK: Shift frequency 10mHz ~15MHz (SLOW mode: 1mHz ~100kHz) | - |
| External modulation | Mode Standard With extended external modulation | AM,FM, PM, PWM, FSK, PSK | - |
| Pulse Motor Control (Option) | Frequency | 10mHz~100kHz | |
| | Waveform | Pulse | |
| | Control | CW/CCW or PLS/DIR | CW |
| | Output | Open collector 2 outputs | Open collector 1 output |
| | Sensor input | IN1, IN2 | |

| | | | | |
|-------------------------------------|---|--|---|--|
| | Mode | LIN-A, ARB-A: After acceleration, | LIN-A,: After acceleration, breaking by sensor input | |
| | | LIN-B, ARB-B: After acceleration, breaking by specified pulse counts | LIN-B: After acceleration, breaking by specified pulse counts | |
| | Acceleration, breaking curve | Linear, S shape, Arbitrary | Linear | |
| | Pulse counts | 16777216 | | |
| | Acceleration, breaking time | 1ms~45s | | |
| ARB (Arbitrary signal generator) | Data length | 16384 words | | |
| | Waveforms | 4 | | |
| | Voltage resolution | 12 bits | | |
| | Number of Bank | 4 | | |
| | Bank switch trigger | COUNT, TIME, EXT TRIG | | |
| TRIG | Level, | TTL level (H: 2.1Vmin, L: 0.9Vmax) | | |
| | Inputs | 2 | 1 | |
| | Input impedance | 1k or more | | |
| | Minimum pulse width | 100ns | | |
| | TRIG delay | Square: 5% of period + 350ns Pulse: Period/16384 + 800ns | | |
| | SLOW | Square: 5% of period + 2.7μs | - | |
| | | Pulse: Period/16384 + 2.7μs | | |
| Setup memory | 9 | | | |
| Remote control | GP-IB, RS-232 | | | |
| Input / output | Output | CH1, CH2, SYNC_F, SYNC_R/SWEEP SYNC, SWEEP MARKER | OUT, SYNC OUT, SWEEP SYNC, SWEEP MARKER | |
| | Input | TRIG1/GATE1, TRIG2/GATE2, MODUL TRIG/GATE | | |
| Power | Voltage | AC100V 110V, 220V, 240V Factory option | | |
| | Frequency | 50Hz, 60Hz, 400Hz | | |
| | Consumption | Approx. 100VA | Approx. 55VA | |
| Dimensions | Approx. 210W x 99H x 403L mm | Approx. 210W x 99H x 353L mm | | |
| Weight | Approx. 5.5kg | Approx. 4kg | | |
| Environment conditions | Storage | -20°C ~ +60°C / 90%R.H. or less | | |
| | Operating | 0°C ~ +40°C / 85%R.H. or less | | |
| Warm up time | 30 min or more | | | |
| Accessories | Power cord (1), Operation manual (1) | | | |
| Factory option | PMC: SG-507 Extended external modulation: SG-508 | PMC: SG-506 | | |