TOMCO

BT00500-AlphaA
0.01MHz-3MHz
500W

- • Scientific and
  Industrial Applications

The BT-AlphaA series is a range of class AB RF power amplifiers covering the 10kHz to 3MHz frequency range.

- • Rugged, solid-state design - high reliability
- • Extremely high phase and amplitude stability
- • Very fast pulse rise/fall times
- • High linearity
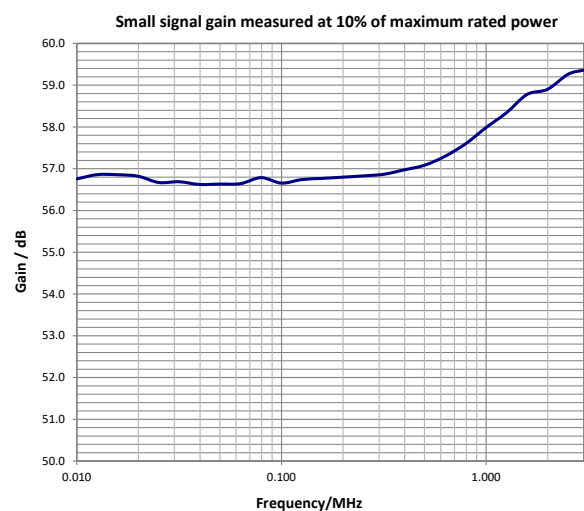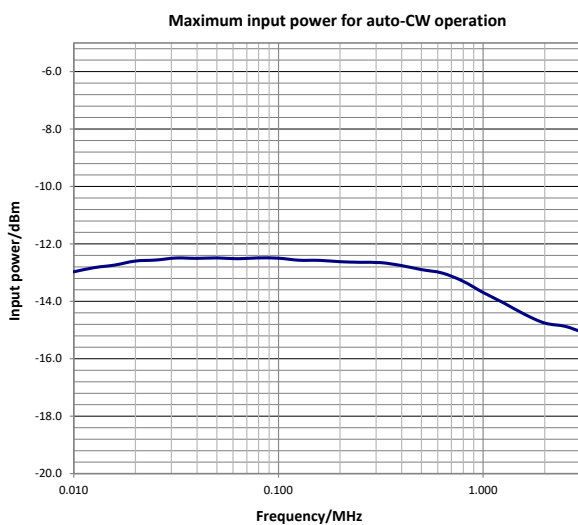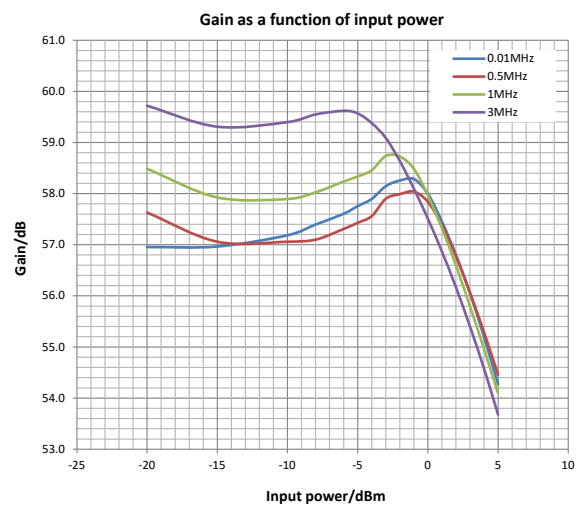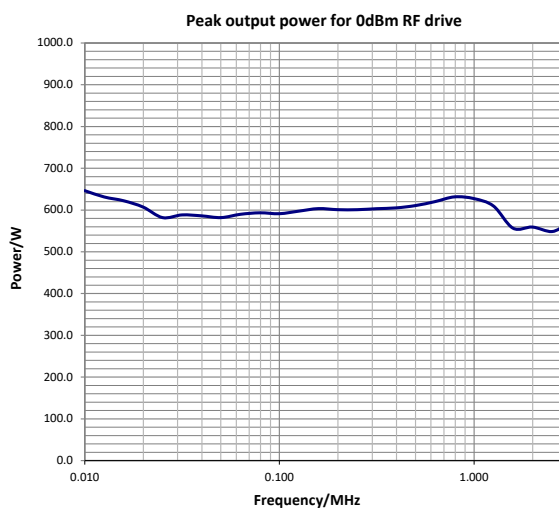- • Very low interpulse noise
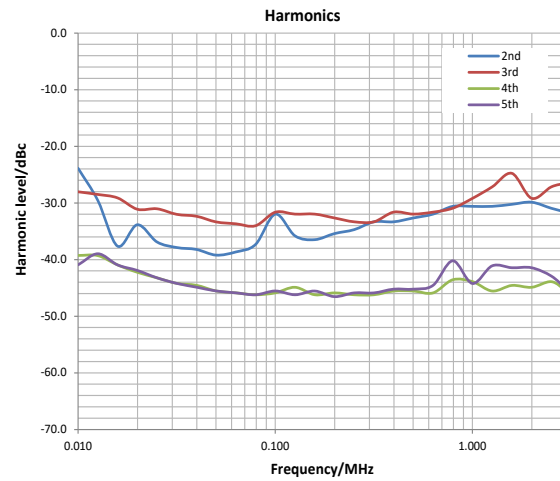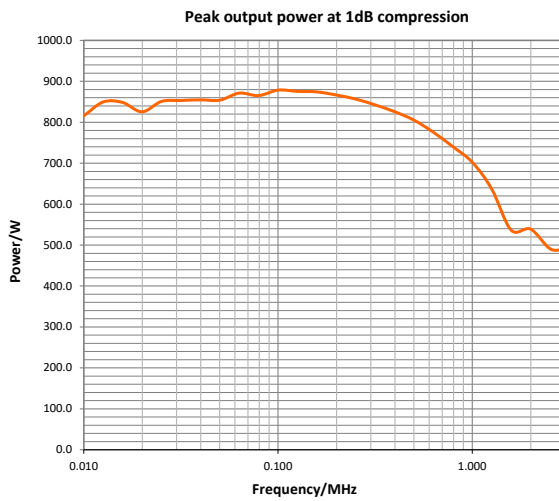- • Competitively priced

RF Specifications

Type	Class AB MOSFET
Rated Power	500W minimum PEP for input power of 0dBm
P1dB	400W minimum Minimum output power at P1dB compression
Gain	57dB minimum
Frequency	0.01MHz-3MHz
Gain flatness	±1.5dB maximum (measured at 1/10th rated output power)
Max. duty cycle	20% Maximum GATE duty cycle
Max. pulse width	100ms Maximum GATE pulse width
Rated power in CW mode	25W CW operation is automatically available at output power level less than approx. 10% of full rated power
Pulse droop	0.5dB maximum Measured at max. pulse width at P1dB level
Pulse rise and fall times	Risetime: 200ns typical Falltime: 100ns typical using a pre-gated RF input signal
Gate rise and fall times	Risetime: 300ns typical Falltime: 150ns typical
Gate delay	Rising edge: 1µs typical Falling edge: 500ns typical Rising edge measured from rising edge of GATE pulse to 90% RF output voltage. Falling edge measured from falling edge of GATE pulse to 10% RF output voltage
Harmonics	Odd: -20dBc typical, -10dBc max. Even: -30dBc typical, -20dBc max. Measured at 1dB below rated output power
Spurious	<-70dBc maximum
Output noise (blanked)	<10dB above thermal (100kHz bandwidth)
Phase change/power	<10˚ from -40dB to full power
Phase stability	<1˚ across 100ms pulse
Output sample	-50dB into 50 Ω (forward voltage sample)
Input/output impedance	50 Ω nominal
Load VSWR	Tolerates at least 3:1 @ full rated power without shut down
Gain control range	10dB minimum for 0-5V control voltage Control via parallel interface
RF Input	0dBm nominal, 10dBm for no damage
GATE (blanking)	Logic low = Blank, logic high = unblank. CMOS and TTL compatible

Electrical Specifications

Mains supply voltage	110-240V, 50-60Hz, single phase
Rated Power	2kVA maximum
Mains inlet	1 x IEC inlet (mains power cord supplied)

RF Amplifier Data Sheet

Typical Performance Plots

Peak output power at 1dB compression

Harmonics

Peak output power for 0dBm RF drive

Gain as a function of input power

Maximum input power for auto-CW operation

Small signal gain measured at 10% of maximum rated power

Mechanical Specifications

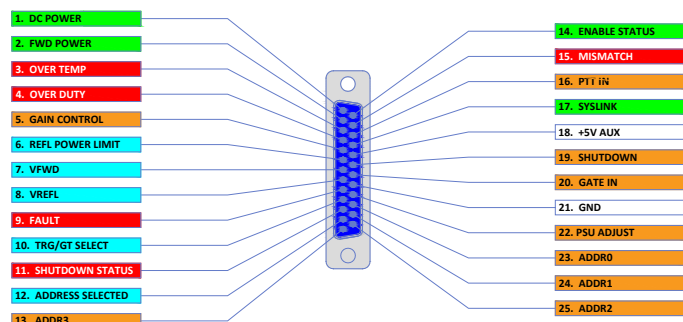|		
Connectors	RF IN:	BNC female
	GATE:	BNC female
	RF SAMPLE:	BNC female
	RF OUT:	N type female
	INTERFACE:	DB25 female
	Other connectors types available on request	
Dimensions	Chassis size:	450mmW (17.7"W) x 500mmD (19.7"D) x 129mmH (5.1"H)
	Total size:	482mmW (19"W) x 563mm (22.2"D) x 131mm (5.2"H)
	Rack compatibility: 19" 3RU	
Weight	approx. 17kg (38lbs)	
Enclosure classification	IP20	
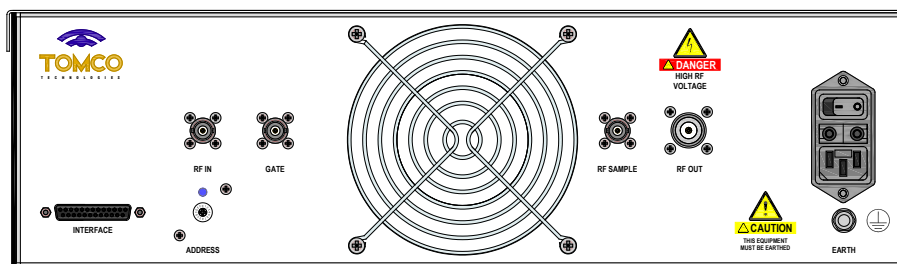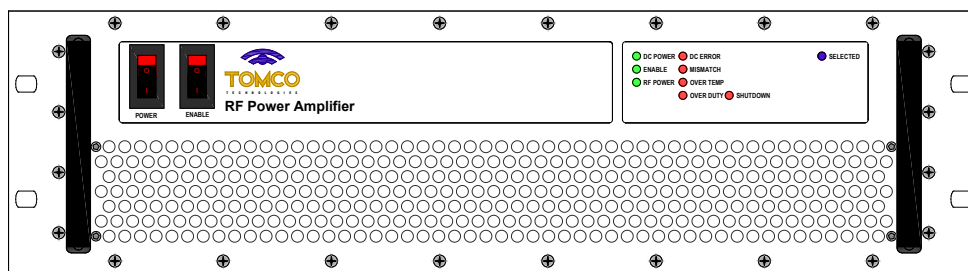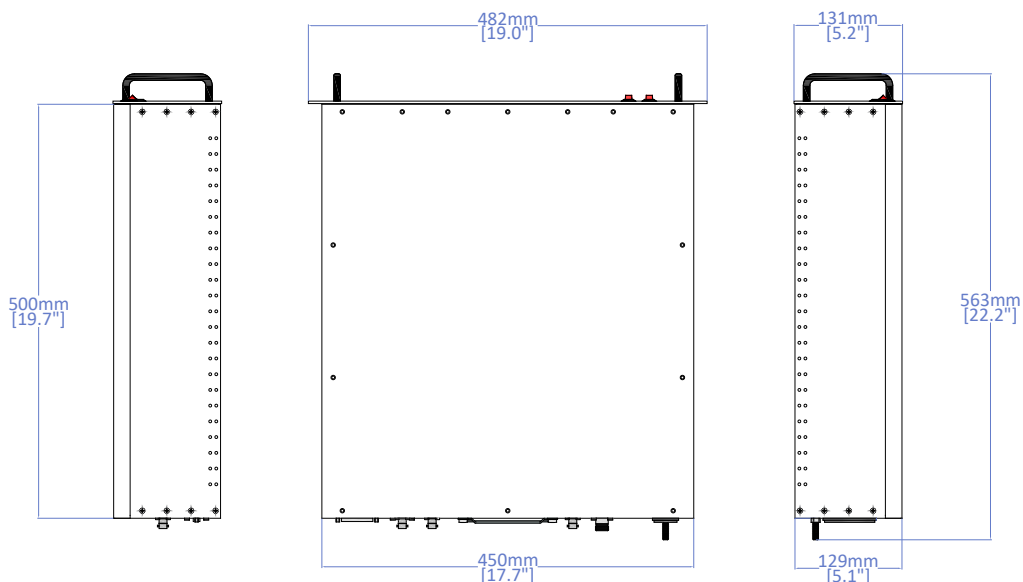
Protection

Load VSWR	Tolerates up to VSWR 3:1 at full rated power without shutdown Self-resetting shutdown protection activates if VSWR limits are exceeded
Over temperature	Self-resetting shutdown protection activates if thermal limits are exceeded
Duty cycle	Duty cycle limit is determined from the GATE signal duty cycle. Self-resetting shutdown protection activates if duty cycle limit is exceeded If output power is less than approx. 10% of maximum rated power, duty cycle protection is disabled and auto-CW operation is available
Pulse width	Pulse width limit is determined from the GATE signal pulse width. Self-resetting shutdown protection activates if pulse width limit is exceeded

Monitoring and Control

Front panel switches	Power (turns on DC power) Enable (enables RF)
Front panel LEDs	• DC POWER • DC ERROR • SELECTED • ENABLE • MISMATCH • SHUTDOWN • RF POWER • OVER TEMP • OVER DUTY
Parallel interface	25-pin D-connector (pinout available at www.tomcorf.com/pdf/interface.pdf)*

Output signal indicating normal operation
Output signal indicating fault condition
Output signal for information only
Input signal

1. DC POWER
2. FWD POWER
3. OVER TEMP
4. OVER DUTY
5. GAIN CONTROL
6. REFL POWER LIMIT
7. VFWD
8. VREFL
9. FAULT
10. TRG/GT SELECT
11. SHUTDOWN STATUS
12. ADDRESS SELECTED
13. ADDR3

14. ENABLE STATUS
15. MISMATCH
16. PTT IN
17. SYSLINK
18. +5V AUX
19. SHUTDOWN
20. GATE IN
21. GND
22. PSU ADJUST
23. ADDR0
24. ADDR1
25. ADDR2

*Some functions may be unavailable on select amplifier models

Environmental

General	Intended for use only in controlled, indoor environment. Non-consumer product for industrial and scientific use. This product is not authorised for stand-alone on-air use. Additional systems, hardware and considerations are required to meet local spectral management regulations. Compliance of the final complete system is the responsibility of the end user.
Cooling	Forced air, front to rear
Operating temperature	+5^{0}C to +40^{0}C
Storage temperature	-20^{0}C to +60^{0}C
Humidity	80% for temperature up to 31^{0}C, decreasing linearly to 50% relative humidity at 40^{0}C
Operating altitude	Up to 2000m
Pollution degree	2
Transient voltage compatibility	Category II, in line with IEC 60364-4-44:2007
Electromagnetic compatibility	In line with IEC61326-1:2012 ISM equipment, Group 1, Class A For use only in shielded areas. ENC55011 (CISPR 11) limits exceeded by up to 40dB For use with isolated mains source. IEC61000-3-3:2013 (flicker) limits may be exceeded during high power pulsed operation
Safety	In line with IEC61010-1:2010
Electromagnetic field strength	In line with ICNIRP Guidelines: 1998, occupational limits

BT00500-AlphaA

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Change record

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DS006662A	JR	10/07/2018	Original
DS006662B	JR	24/07/2019	p.4:EM
DS006662C	LS	08/04/2020	p.4:E
DS006662D	DW	10/09/2020	p.1:RFS
DS006662E	LS	12/01/2021	p.1:H
DS006662F	LS	09/11/2022	p.4:E