The RF Line

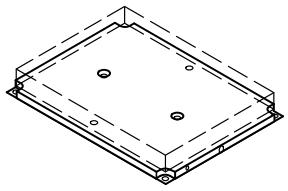
Broadband RF Array for TV Transmitter

RFA8180B

180 W C.W. (28 V)
270 W P. SYNC. (32 V)
470–860 MHz
RF POWER AMPLIFIER

The RFA8180B is a solid state class AB amplifier and is specifically designed for TV transposers and transmitters. This amplifier incorporates microstrip technology and reliable Motorola push–pull transistors.

- Specified 28 Volts, 470–860 MHz Characteristics
  Output Power — 180 Watts (CW)
  Gain — 8 dB Min (@ 180 W)
- 50 Ω Input and Output Impedance



CASE 429–02, STYLE 1

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Supply Voltage	V_{CC}	32	Vdc
Quiescent Current	I_{CQ}	2 [2 x 300]	mAdc
Input Power	P_{in}	35	W
Storage Temperature Range	T_{stg}	–40 to +100	°C
Operating Temperature (1)	T_{op}	–20 to +70	°C

ELECTRICAL CHARACTERISTICS (T_C = 25°C, V_{CC} = 28 V, I_{CQ} = 2 x 200 mA, unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Instantaneous Bandwidth	BW	470	—	860	MHz
Input Return Loss	IRL	—	—	–15	dB

FUNCTIONAL TESTS IN CW (SOUND) (T_C = 25°C, V_{CC} = 28 V, I_{CQ} = 2 x 200 mA, f = 470–860 MHz, unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain (P_{out} = 180 W)	G_p	8	—	—	dB
Gain Ripple (P_{out} = 180 W)	G_{rple}	—	—	±1	dB
Output Power @ 1 dB Compression	P_{out}	180	—	—	W
Mismatch Tolerance (P_{out} = 180 W)	VSWR	3:1	—	—	—
Efficiency (P_{out} = 180 W)	η	48	51	—	%

FUNCTIONAL TESTS IN VIDEO (standard black level)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Output Power (synch.) (V_{CC} = 28 Vdc)	P_{out_1}	230	—	—	W
Peak Output Power (synch.) (V_{CC} = 32 Vdc)	P_{out_2}	270	—	—	W

NOTE:
1. Temperature is measured at temperature test point (on the flange of the transistor).

TYPICAL CHARACTERISTICS
CW — WIDEBAND

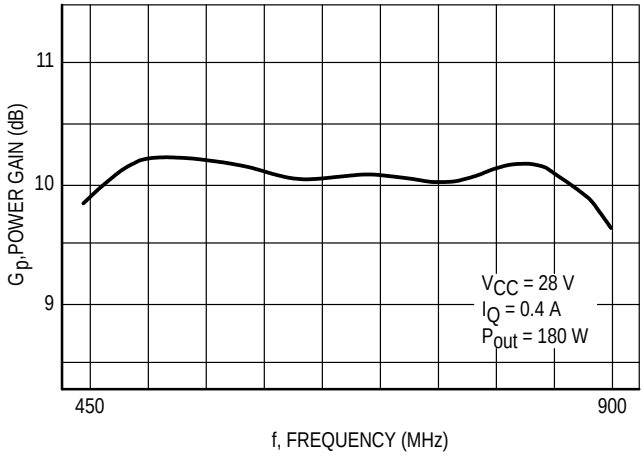


Figure 1. Power Gain versus Frequency

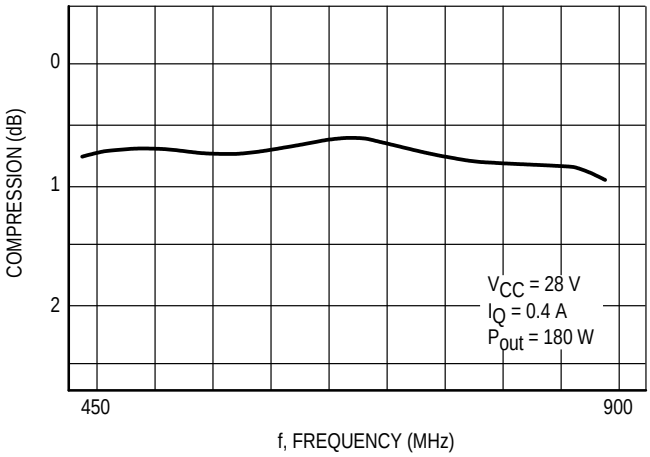


Figure 2. Gain Compression versus Frequency

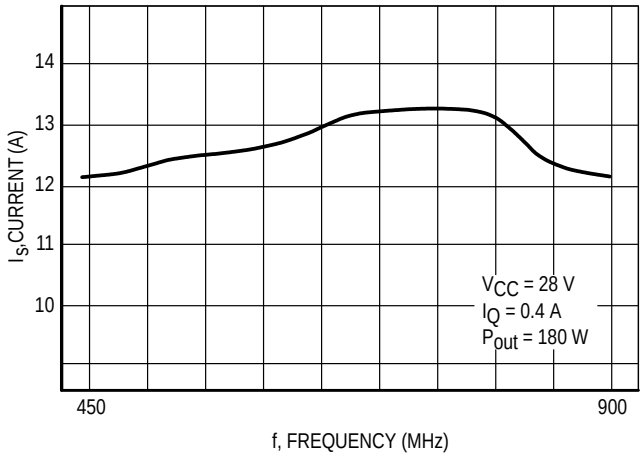


Figure 3. Supply Current versus Frequency

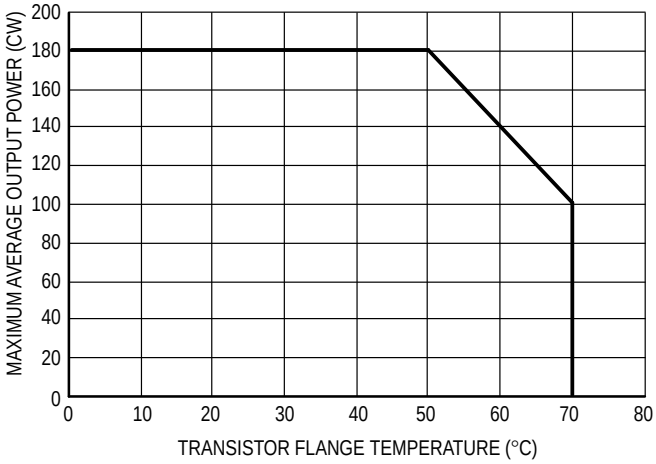


Figure 4. Maximum Average Output Power versus Temperature

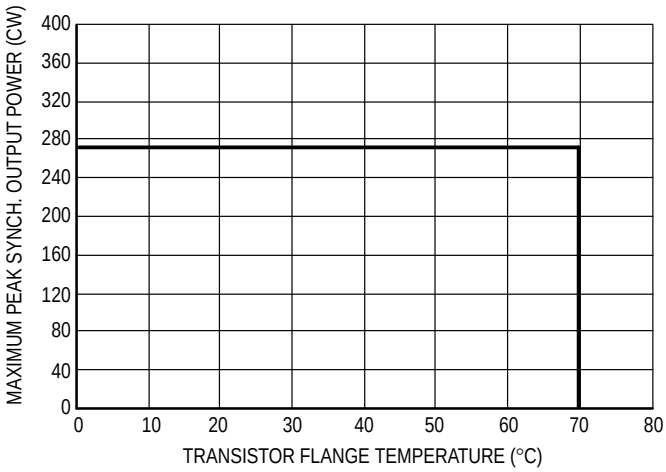


Figure 5. Maximum Peak Synch. Output Power (B/G Standard) versus Temperature

TYPICAL VIDEO CHARACTERISTICS @ f = 860 MHz

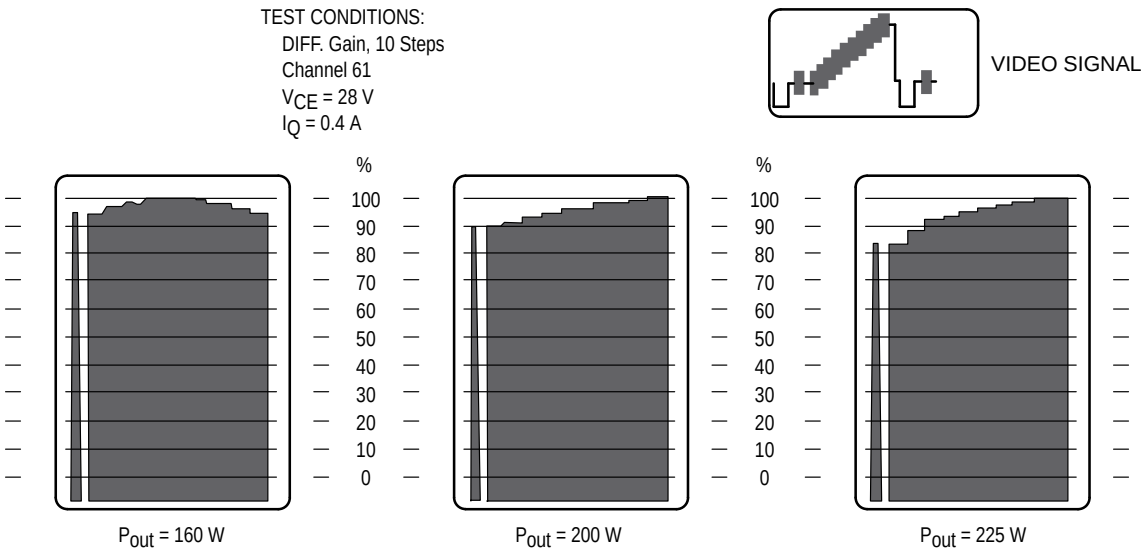
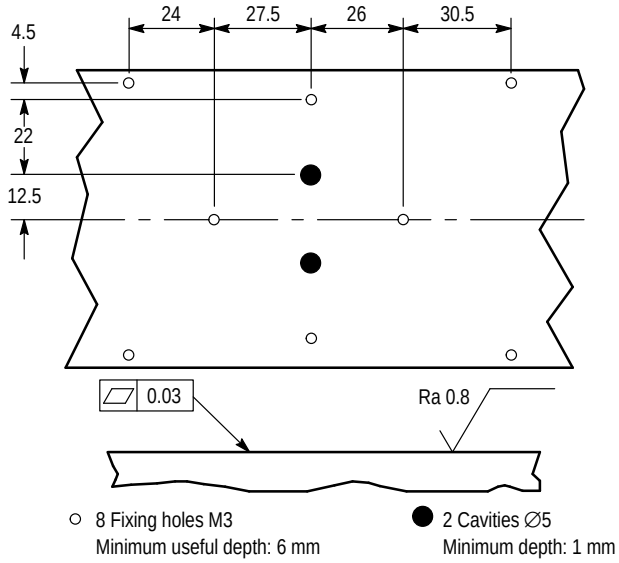


Figure 6. Differential Gain

APPLICATIONS INFORMATION

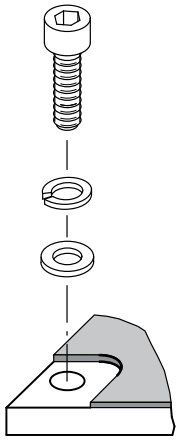
HEATSINK TOOLING



MOUNTING RECOMMENDATIONS

THERMAL COMPOUND

- Paste with silicones: SICERONT KF Ref. 1201 Recommended.
- Thickness: Optimum between 0.06 mm and 0.15 mm, on the whole back surface of the amplifier.
  (Typical volume: 700 mm 3 for 0.1 mm thickness)
  (Equivalent weight: 1.5g for 2.2 density paste).



SCREWS

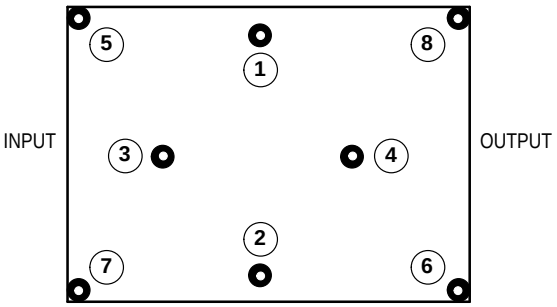
- Socket head cap screws: CHC M3 x 10 for Copper/Aluminum Heatsink.
- Material: Nickel plated steel.

WASHERS

- Split lock washers WZ ∅3 + Flat washers ZU ∅3.

MOUNTING RECOMMENDATIONS (continued)

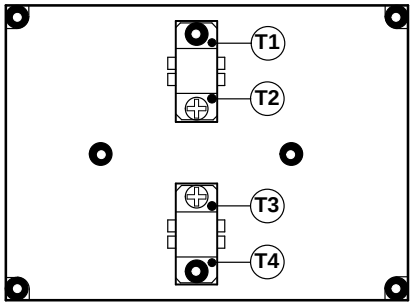
TIGHTENING ORDER



Recommended Torque: 12 Kg.cm (10.5 in.lbs)

MOUNTING VERIFICATION

Make the amplifier work at nominal RF conditions, and measure temperature on points 1, 2, 3, and 4.

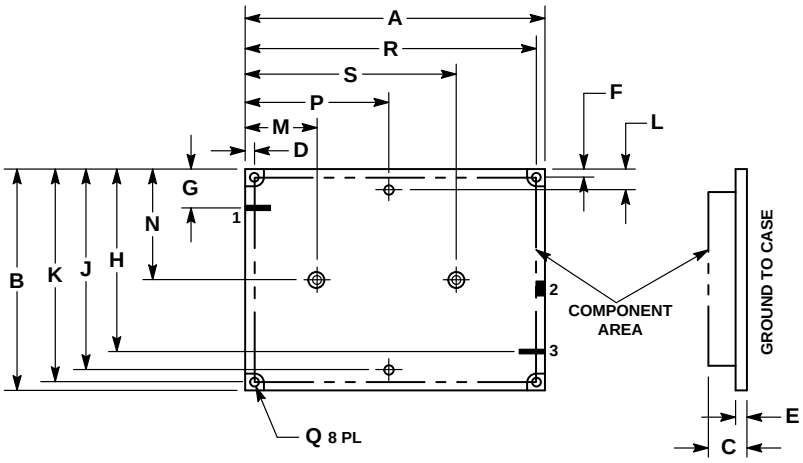


Characteristic	Typ	Max	Unit
T1, T2, T3, T4	—	70	°C
Δ(T1, T2), Δ(T3, T4)	3	5	°C

CLEANING

Some components of the RFA8180B amplifier are not qualified for every kind of cleaning solvent; do not clean the amplifier in a solvent bath. Local cleaning is recommended.

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	114.88	115.12	4.523	4.532
B	84.88	85.12	3.342	3.351
C	—	15.00	—	0.591
D	3.40	3.60	0.134	0.142
E	4.50	4.90	0.177	0.193
F	3.40	3.60	0.134	0.142
G	14.60	15.40	0.575	0.606
H	69.60	70.40	2.740	2.772
J	76.90	77.10	3.205	3.035
K	81.40	81.60	3.205	3.213
L	7.90	8.10	0.311	0.319
M	27.40	27.60	1.079	1.087
N	42.40	42.60	1.669	1.677
P	54.90	55.10	2.161	2.169
Q	3.10	3.40	0.122	0.134
R	111.40	111.60	4.386	4.394
S	80.90	81.10	3.185	3.193

STYLE 1:
PIN 1. RF INPUT
2. DC VOLTAGE
3. RF OUTPUT
GROUND TO PLANE

CASE 429–02
ISSUE A

Literature Distribution Centers:
USA: Motorola Literature Distribution; P.O. Box 20912; Phoenix, Arizona 85036.
EUROPE: Motorola Ltd.; European Literature Centre; 88 Tanners Drive, Blakelands, Milton Keynes, MK14 5BP, England.
JAPAN: Nippon Motorola Ltd.; 4-32-1, Nishi-Gotanda, Shinagawa-ku, Tokyo 141, Japan.
ASIA PACIFIC: Motorola Semiconductors H.K. Ltd.; Silicon Harbour Center, No. 2 Dai King Street, Tai Po Industrial Estate, Tai Po, N.T., Hong Kong.