

The RF Line UHF Linear Power Transistor

Designed for driver and output stages in band IV and V TV transposers and transmitter amplifiers. The TPV695A uses gold metallized die with diffused emitter ballast resistors to enhance reliability, ruggedness and linearity.

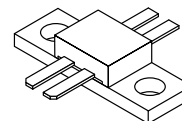
- Band IV and V (470–860 MHz)
- 14 W — P_{ref} @ –47 dB IMD
- 25 V — V_{CC}
- High Gain — 10 dB Min, Class A, $f = 860$ MHz
- Gold Metallization for Reliability
- Push–Pull Package

TPV695A

14 W, 470–860 MHz
UHF LINEAR
POWER TRANSISTOR

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	28	Vdc
Collector–Base Voltage	V_{CES}	50	Vdc
Emitter–Base Voltage	V_{EBO}	4.0	Vdc
Collector Current — Continuous	I_C	5.0	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	50 0.4	Watts W/ $^\circ\text{C}$
Operating Junction Temperature	T_J	200	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	–50 to +200	$^\circ\text{C}$
Operating Case Temperature Range	T_C	–15 to +70	$^\circ\text{C}$



CASE 395B–01, STYLE 1
BMA2

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.5	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
----------------	--------	-----	-----	-----	------

OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage ($I_C = 20$ mA, $I_B = 0$)	$V_{(BR)CEO}$	28	—	—	Vdc
Collector–Emitter Breakdown Voltage ($I_C = 20$ mA, $V_{BE} = 0$)	$V_{(BR)CES}$	50	—	—	Vdc
Emitter–Base Breakdown Voltage ($I_E = 5.0$ mA, $I_C = 0$)	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 19$ V, $I_E = 0$)	I_{CBO}	—	—	15	mAdc

ON CHARACTERISTICS

DC Current Gain ($I_C = 1.0$ A, $V_{CE} = 10$ V)	h_{FE}	20	—	80	—
---	----------	----	---	----	---

DYNAMIC CHARACTERISTICS

Output Capacitance ($V_{CB} = 28$ V, $I_E = 0$, $f = 1.0$ MHz)	C_{ob}	—	18	20	pF
--	----------	---	----	----	----

FUNCTIONAL TESTS

Common–Emitter Amplifier Power Gain ($V_{CE} = 25$ V, $P_{out} = 14$ W, $f = 860$ MHz, $I_C = 2.0 \times 900$ mA)	G_{PE}	10	—	—	dB
Overdrive (no degradation) ($f = 470$ MHz, $V_{CE} = 25$ V, $I_C = 2.0 \times 900$ mA)	P_{inover}	12.5	—	—	W
Intermodulation Distortion, 3 Tone ($f = 860$ MHz, $V_{CE} = 25$ V, $I_E = 2.0 \times 900$ mA, $P_{ref} = 14$ W, Vision Carrier = –7.0 dB, Sound Carrier = –8.0 dB, Sideband Signal = –16 dB, Specification TV05001)	IMD_1	—	–47	–46	dB



Dimension: width/length mm
 Board Material — 1/50", Teflon Glass, $\epsilon_r = 2.55$

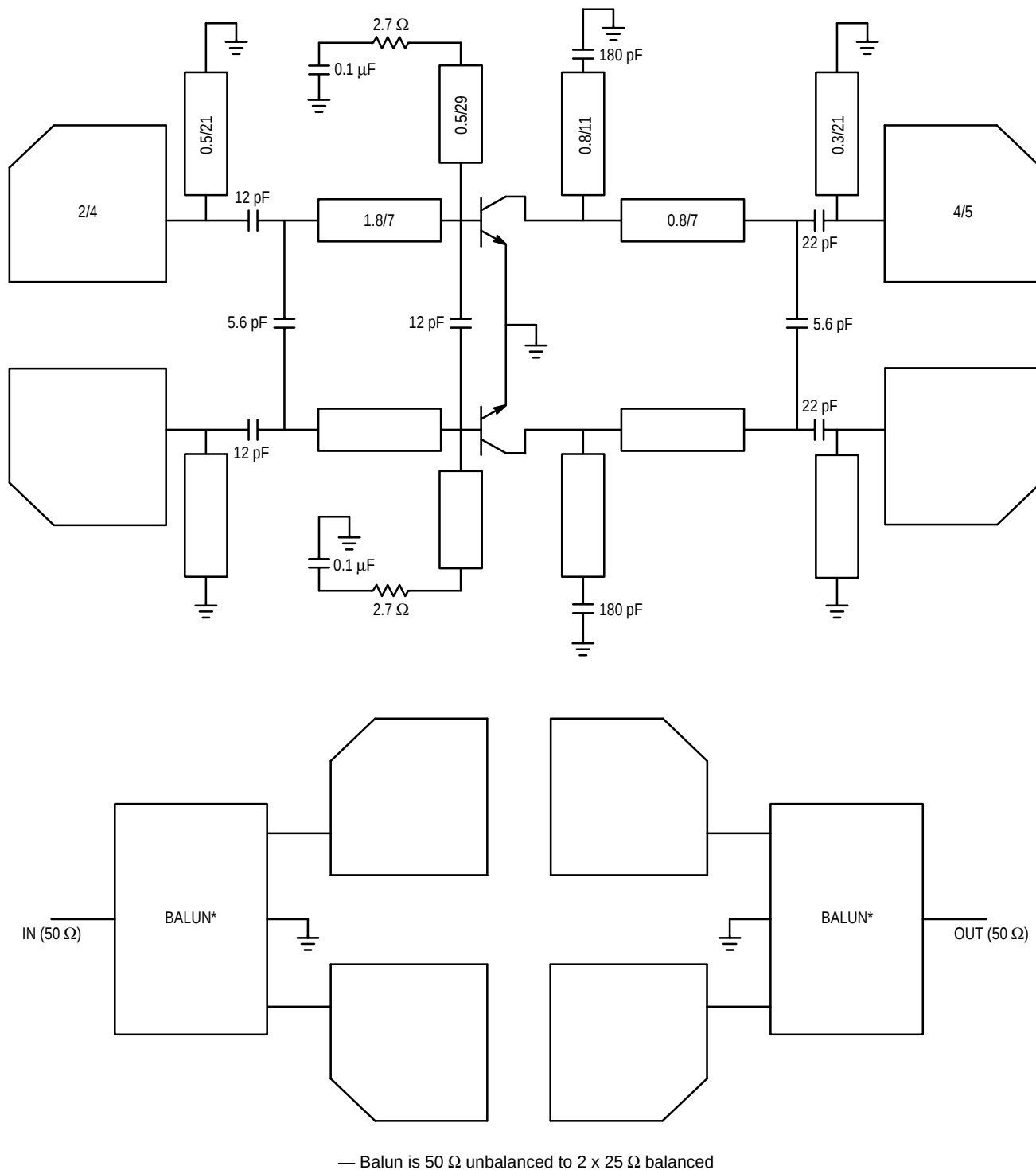


Figure 1. 470–860 MHz Test Circuit

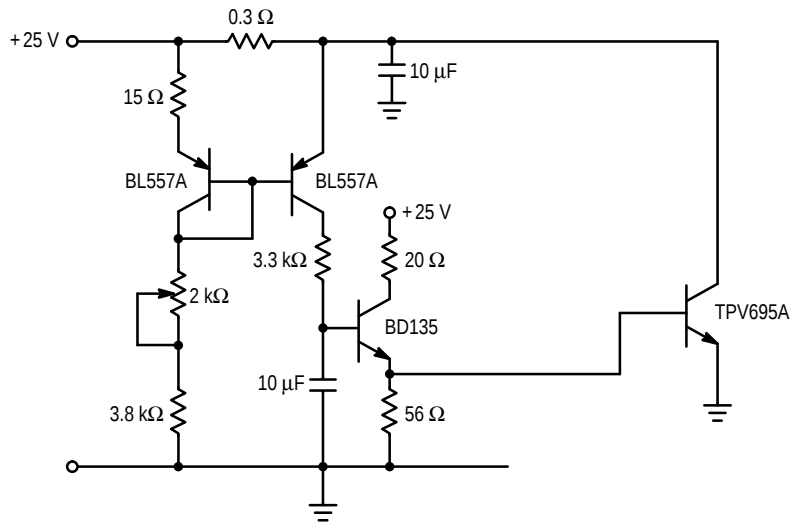


Figure 2. Bias Network

Intermodulation Distortion, 3 Tone

Test Conditions:

@ -8 dB Ref. Vision Carrier, -7 dB Ref. Sound Carrier,
-16 dB Ref. Sideband Signal

$P_{ref} = 14$ Watts

$V_{CB} = 25$ Volts & $I_{CS} = 2 \times 900$ mA

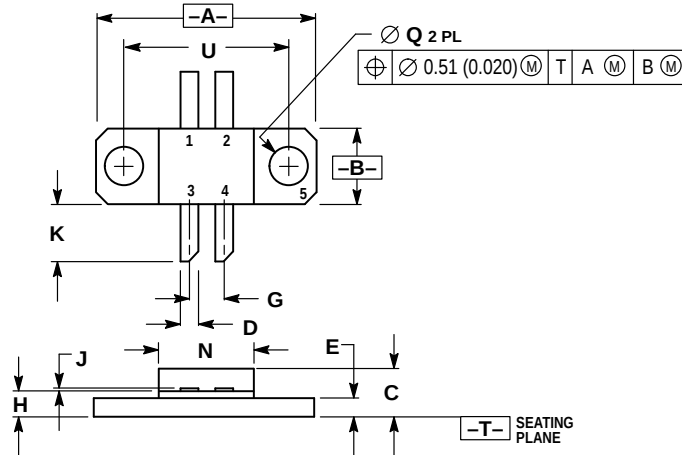
Frequency MHz	IMD dB
860	-47
760	-47
660	-47
560	-47
470	-48

Figure 3. IMD versus Frequency

f (MHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	S ₁₁	∠ φ	S ₂₁	∠ φ	S ₁₂	∠ φ	S ₂₂	∠ φ
400	0.918	176.6	0.605	58.3	$2.75 \cdot 10^{-4}$	-8.2	0.449	-173.1
450	0.908	175.6	1.44	53.1	$3.01 \cdot 10^{-4}$	-11.8	0.452	-172.4
500	0.877	176.1	1.28	48.3	$3.10 \cdot 10^{-4}$	-12.8	0.438	-171.7
550	0.889	174.5	1.21	42.3	$3.72 \cdot 10^{-4}$	-16.3	0.452	-170.1
600	0.891	174.0	1.16	36.3	$4.31 \cdot 10^{-4}$	-18.5	0.466	-168.9
650	0.863	173.6	1.15	29.9	$6.11 \cdot 10^{-4}$	-25	0.469	-167.2
700	0.839	173.1	1.15	21.9	$6.03 \cdot 10^{-4}$	-34.3	0.500	-165.5
750	0.805	172.8	1.15	13.8	$6.55 \cdot 10^{-4}$	-39.9	0.541	-164.2
800	0.800	172.6	1.15	4.7	$7.29 \cdot 10^{-4}$	-46.6	0.583	-163.5
850	0.771	172.3	1.20	-8.2	$8.39 \cdot 10^{-4}$	-57.4	0.673	-163.1
900	0.762	172.2	1.11	-21.1	$8.55 \cdot 10^{-4}$	-67.6	0.759	-164.3

Table 1. S-Parameters

PACKAGE DIMENSIONS



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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.739	0.750	18.77	19.05
B	0.240	0.260	6.10	6.60
C	0.165	0.198	4.19	5.03
D	0.055	0.065	1.40	1.65
E	0.055	0.070	1.40	1.78
G	0.110	0.130	2.79	3.30
H	0.079	0.091	2.01	2.31
J	0.003	0.005	0.08	0.13
K	0.180	0.220	4.57	5.59
N	0.315	0.330	8.00	8.38
Q	0.125	0.135	3.18	3.42
U	0.560 BSC		14.22 BSC	

- STYLE 1:
1. BASE
 2. BASE
 3. COLLECTOR
 4. COLLECTOR
 5. EMITTER

CASE 395B-01 ISSUE A

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters can and do vary in different applications. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

How to reach us:

USA / EUROPE: Motorola Literature Distribution;
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, Toshikatsu Otsuki,
6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-3521-8315

MFAX: RMFAX0@email.sps.mot.com - TOUCHTONE (602) 244-6609
INTERNET: http://Design-NET.com

HONG KONG: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298



MOTOROLA



TPV695A/D

