

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.

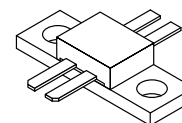
- Band IV and V (470–860 MHz)
- 14 W — P_{ref} @ –47 dB IMD
- 25 V — V_{CC}
- High Gain — 10 dB Min, Class A, $f = 860$ MHz
- Gold Metallization for Reliability
- Push–Pull Package

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	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
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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	—
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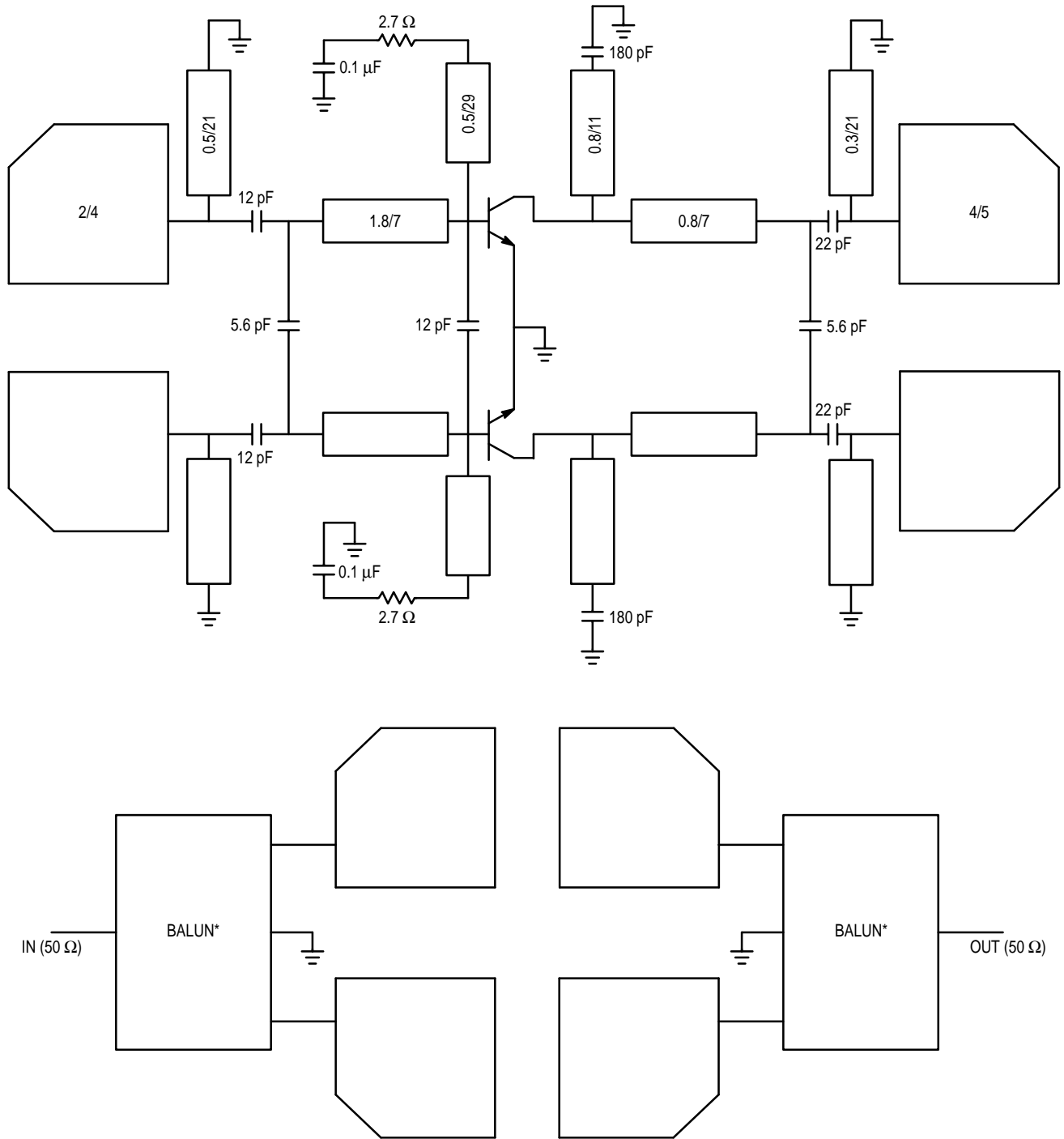
DYNAMIC CHARACTERISTICS

Output Capacitance ($V_{CB} = 28$ V, $I_E = 0$, $f = 1.0$ MHz)	C_{ob}	—	18	20	pF
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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, $\epsilon_r = 2.55$



— Balun is 50 Ω unbalanced to 2 x 25 Ω balanced

Figure 1. 470–860 MHz Test Circuit

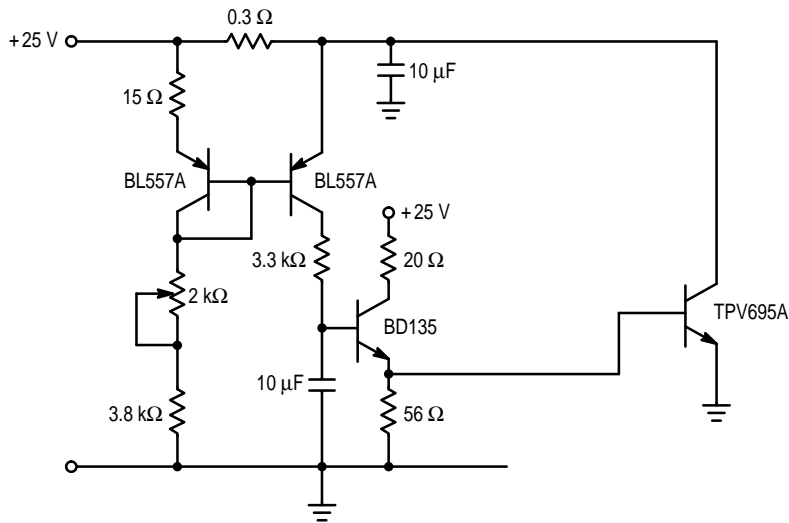


Figure 2. Bias Network

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

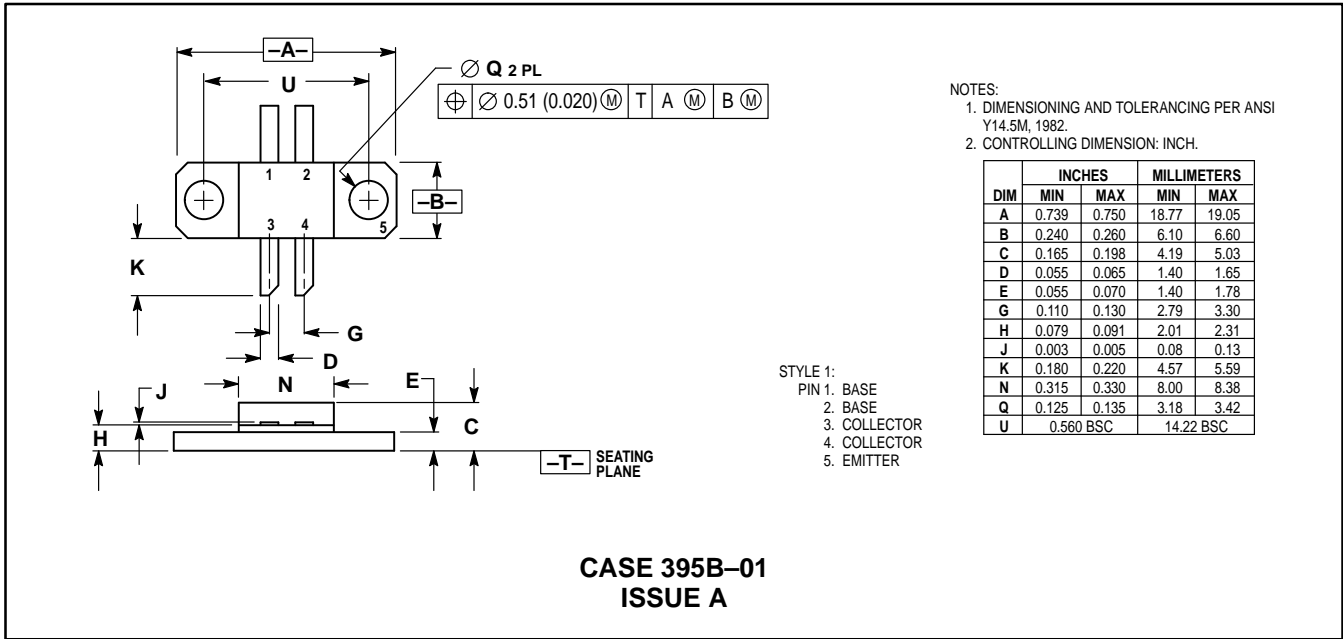
Frequency MHz	IMD dB
860	-47
760	-47
660	-47
560	-47
470	-48

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	2.75·10 ⁻⁴	-8.2	0.449	-173.1
450	0.908	175.6	1.44	53.1	3.01·10 ⁻⁴	-11.8	0.452	-172.4
500	0.877	176.1	1.28	48.3	3.10·10 ⁻⁴	-12.8	0.438	-171.7
550	0.889	174.5	1.21	42.3	3.72·10 ⁻⁴	-16.3	0.452	-170.1
600	0.891	174.0	1.16	36.3	4.31·10 ⁻⁴	-18.5	0.466	-168.9
650	0.863	173.6	1.15	29.9	6.11·10 ⁻⁴	-25	0.469	-167.2
700	0.839	173.1	1.15	21.9	6.03·10 ⁻⁴	-34.3	0.500	-165.5
750	0.805	172.8	1.15	13.8	6.55·10 ⁻⁴	-39.9	0.541	-164.2
800	0.800	172.6	1.15	4.7	7.29·10 ⁻⁴	-46.6	0.583	-163.5
850	0.771	172.3	1.20	-8.2	8.39·10 ⁻⁴	-57.4	0.673	-163.1
900	0.762	172.2	1.11	-21.1	8.55·10 ⁻⁴	-67.6	0.759	-164.3

Table 1. S-Parameters

PACKAGE DIMENSIONS



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TPV695A/D

