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TV AND FM BROADCASTING

PRODUCT SUMMARY

PART NUMBER	CLASS	POWER (W)	LIN.* (dB)	GAIN (dB)	PACKAGE	PAGE
FM BAND II 88-108 MHz						
TP 9380	C	75	—	10	SOE 500F	D2
TP 9383	C	150	—	9	SOE 500F	D5
TV BAND III 170-230 MHz						
TPV 394	A	5	−58	15	SOE 280	D9
TPV 364	A	10	−54	10	SOE 380	D13
TPV 375	A	14	−55	8.5	SOE 500	D17
TPV 385	A	14	−53	14	JØ 500	D21
TPV 376	A	30	−53	7.5	SOE 500	D23
TPV 3100	A	30	−52	14	MRP 7	D27
TPV 3100	AB	100	1	11	MRP 7	D30
TV BAND IV-V 470-860 MHz						
TPV 590	A	0.250	−60	14	SOE 200	D33
TPV 591	A	0.5	−60	13	SOE 200	D37
TPV 596	A	0.5	−60	12	SOE 280	D41
TPV 597	A	1	−60	11	SOE 280	D45
TPV 593	A	2	−60	8.5	SOE 280	D49
TPV 598	A	4	−60	7	SOE 280	D53
TPV 595A	A	8	−58	8.5	BMA 2	D55
TPV 5051	AB	50	1	6	BMA 2	D61
ATV 5030	A	20	−51	7.5	ATV	D65
ATV 5080	AB	80	1	6	ATV	D69
TPVA 5060	A	50	−51	17	TPVA	D73

* Linearity specification

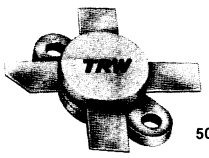
— Devices in Class A : 3 TONES TEST PRef

VISION − 8 dB
SOUND − 7 dB
SIDEBAND − 17 dB
} TRW Document N° 05001

— Devices in Class AB : GAIN COMPRESSION

FM Power Transistor

- 75 W
- 28 V
- 108 MHz
- High Gain
- RF Power Transistor
- NPN Silicon



500 SOE F

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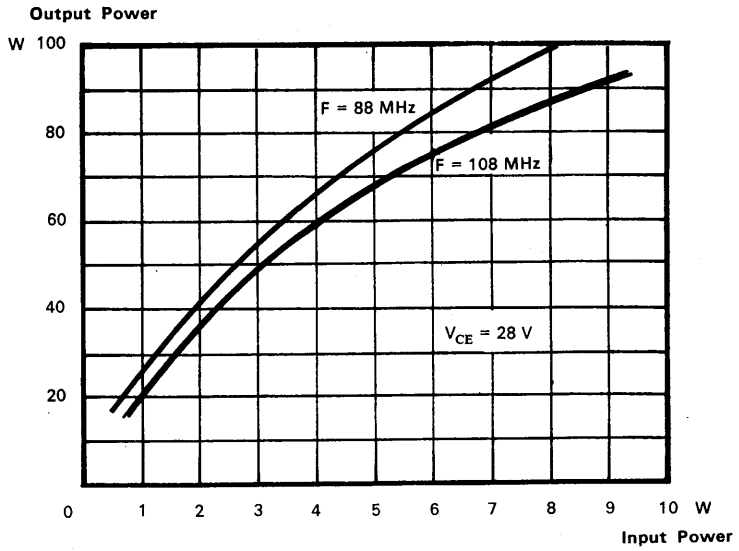
The TP 9380 is designed for use in the new generation of VHF-FM broadcast transmitters operating from a 28 V supply in class A, B or C.

Its construction, which now incorporates the new standard TRW process of gold metallization and diffused ballast resistors, ensures a long operational life even when run at its maximum ratings.

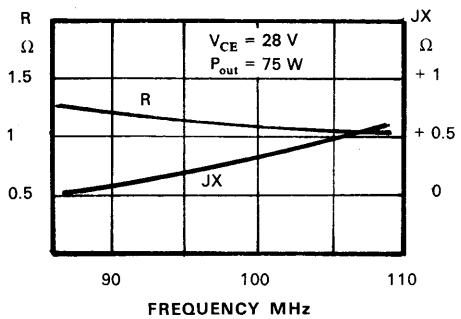
Electrical Characteristics (T_{case} = 25 °C)

	SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC TEST	BV_{EBO}	Emitter - Base Breakdown Voltage	I_E = 10 mA	4			V
	BV_{CEO}	Collector - Emitter Breakdown Voltage	I_C = 50 mA	35			V
	BV_{CER}	Collector - Emitter Breakdown Voltage	I_C = 50 mA R_{BE} = 10 Ω	60			V
	BV_{CBO}	Collector - Base Breakdown Voltage	I_C = 50 mA	65			V
	H_{FE}	DC Current Gain	V_{CE} = 5 V I_C = 1 A	20		150	—
RF TEST	P_G	RF Power Gain	V_{CE} = 28 V P_{in} = 7 W F = 108 MHz	75			W
	η_C	Collector Efficiency	V_{CE} = 28 V P_{out} = 75 W F = 108 MHz	70	75		%
	C_{OB}	Output Capacitance	V_{CB} = 30 V F = 1 MHz			85	pF
	VSWR	Mismatch Tolerance (All phases)	V_{CE} = 28 V P_{out} = 75 W F = 108 MHz All phases	4 : 1			—
THERMAL	I_C	Maximum Collector Current				10	A
	θ_{jc}	Thermal Resistance Junction Case	T case = 70 °C			1.5	°C/W
	θ_{CH}	Thermal Resistance Case Heatsink				0.25	°C/W
	P_S	Power Dissipated	T heatsink = 25 °C			100	W
	T_{STG}	Storage and Junction Temperature		— 65		+ 200	°C

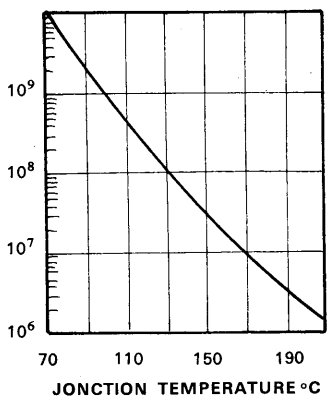
TYPICAL POWER OUTPUT vs POWER INPUT



SERIES INPUT IMPEDANCE vs FREQUENCY

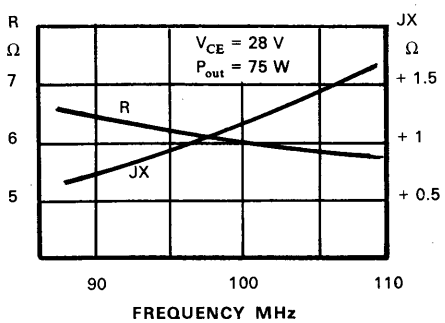


MTTF FACTOR vs Tj

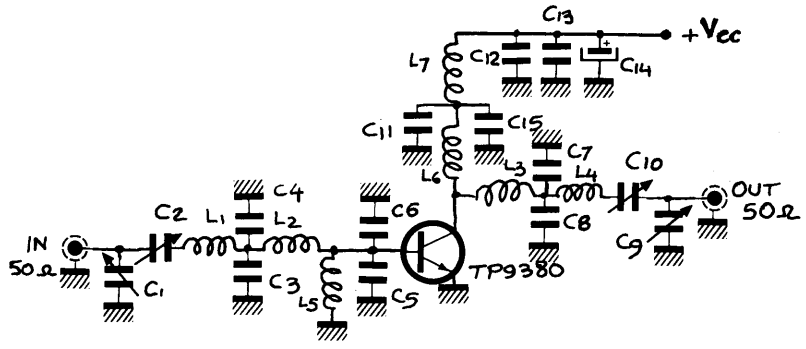


DIVIDE BY Ic2 TO OBTAIN METAL LIFETIME IN HOURS

SERIES LOAD IMPEDANCE vs FREQUENCY



88-108 MHz NARROW BAND TEST FIXTURE



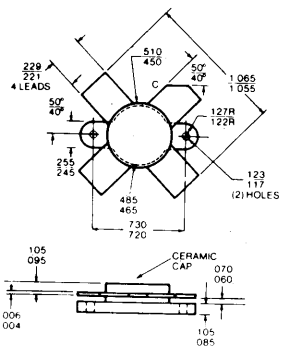
C_1 Arco 425 Variable capacitor (24 - 200 pF).
C_2 Arco 425 Variable capacitor (24 - 200 pF).
C_3 60 pF UNELCO.
C_4 60 pF UNELCO (108 MHz).
100 pF UNELCO (88 MHz).
C_5 330 pF chip capacitor (closed to the transistor).
C_6 330 pF chip capacitor (closed to the transistor).
C_7 40 pF UNELCO.
C_8 40 pF UNELCO (108 MHz).
80 pF UNELCO (88 MHz).
C_9 Arco 423 variable capacitor (7 - 100 pF).
C_{10} Arco 425 variable capacitor (24 - 200 pF).
C_{11} 1 000 pF UNELCO.
C_{12} 1 000 pF UNELCO.
C_{13} 0.1 µF disc capacitor.
C_{14} 100 µF/40 V capacitor.
C_{15} 10 nF disc capacitor.

L_1 3 turns ID = 6 mm 1 mm wire.
L_2 « Hair pin » made with a 1.4 mm wire L = 15 mm
L_3 « Hair pin » made with a 2 mm wire L = 20 mm for 108 MHz.
« Hair pin » made with a 2 mm wire L = 30 mm for 88 MHz.
L_4 3 turns ID = 8 mm 1.4 mm wire.
L_5 0.7 µH chocke.
L_6 6 turns ID = 6 mm 1.2 mm wire L = 15 mm.
L_7 4 turns 1.2 mm wire on ferrite.

Use an ultra flat heatsink.

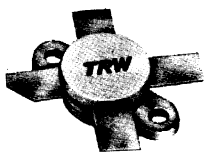
Use a few of silicon thermal grease.

PACKAGE
500 SOE F



FM Power Transistor

- 150 W
- 28 V
- 108 MHz
- High Gain
- RF Power Transistor
- NPN Silicon



500 SOE F

The TP 9383 is designed for use in the new generation of VHF-FM broadcast trasmitters operating from a 28 V supply in class A, B, or C.

Its construction, which now incorporates the new standard TRW process of gold metallization and diffused ballast resistors, ensures a long operational life even when run at its maximum ratings.

Electrical Characteristics (T_{case} = 25 °C)

	SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC TEST	BV_{EBO}	Emitter Base Breakdown Voltage	I_E = 20 mA	4			V
	BV_{CEO}	Collector Emitter Breakdown Voltage	I_C = 100 mA	25			V
	BV_{CER}	Collector Emitter Breakdown Voltage	I_C = 100 mA R_{BE} = 10 Ω	55			V
	BV_{CBO}	Collector Base Breakdown Voltage	I_C = 100 mA	60			V
	h_{FE}	DC current gain	V_{CE} = 5 V I_C = 1 A	20		150	—
RF TEST	P_{out}	Commun Emitter Amplifier output power	V_{CE} = 28 V P_{in} = 18 W F = 108 MHz	150			W
	η_C	Collector Efficiency	V_{CE} = 28 V P_{out} = 150 W F = 108 MHz	70	75		%
	C_{ob}	Output Capacitance	V_{CB} = 28 V F = 1 MHz			150	pF
	VSWR	Voltage Standing wave Ratio	V_{CE} = 28 V P_{out} = 100 W F = 108 MHz P_{out} = 150 W All phases	∞ 4 : 1			— —
THERMAL	$Rth_{J.C}$	Thermal Resistance Junction - Case	Pd = 100 W t = 25 °C t = 70 °C		0,75 0,9	1	°C/W
	$Rth_{C.H}$	Thermal Resistance Case - Heatsink			0,15		°C/W

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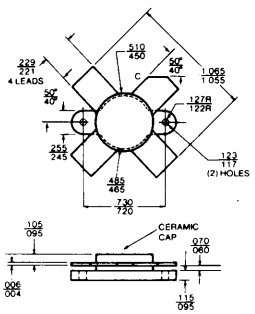
Absolute Maximum Ratings

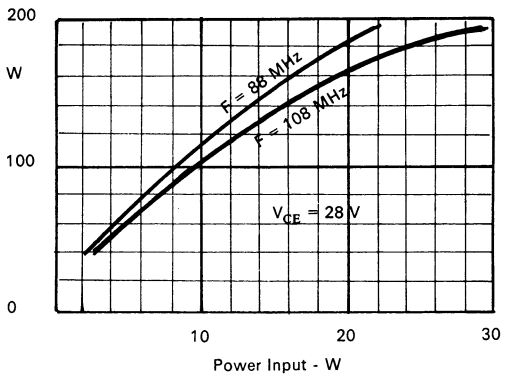
Emitter Base Voltage	V_{EB}	4 V
Collector Emitter Voltage	V_{CE}	35 V
Collector Base Voltage	V_{CB}	60 V
Collector Current	I_C	16 A
Total device power dissipation t_{case} = 25 °C	P_d	150 W
Storage and junction temperature	T_{STG}	— 65 to + 200 °C

TP 9383
500 SOE Flange

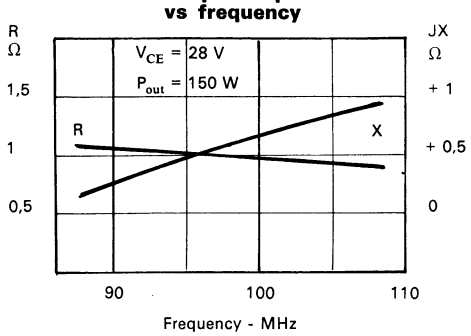


Use ultra flat heatsink. Make Stud hole as small as possible.
Use a few of silicon grease.

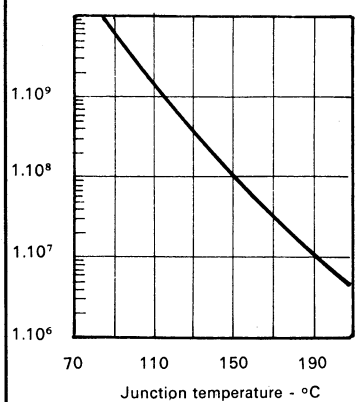
Power Output vs Power Input



Series Input Impedance vs frequency

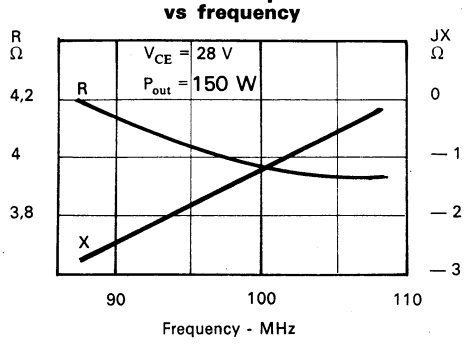


MTTF factor vs Tj

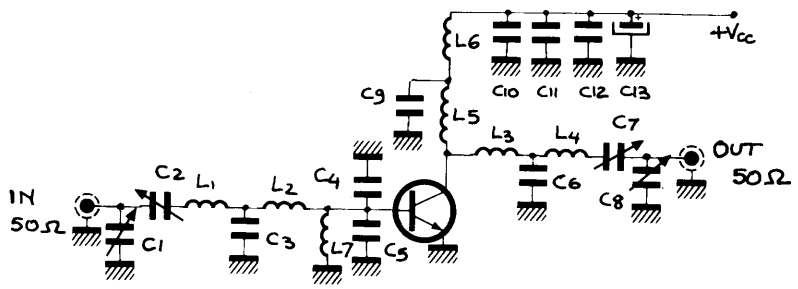


Divide by Ic^2 to obtain metal lifetime in hours.

Series load impedance vs frequency



Test circuit 88-108 MHz
Narrow band



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C_1 ARCO 425 Variable capacitor 24-200 pF
C_2 ARCO 425
C_3 150 pF UNELCO
C_4 470 pF Chip capacitor (very close to the transistor) ATC
C_5 470 pF Chip capacitor (very close to the transistor) ATC
C_6 300 pF UNELCO
C_7 ARCO 425
C_8 ARCO 425
C_9 1000 pF UNELCO
C_{10} 1000 pF UNELCO
C_{11} 10000 pF
C_{12} 0.1 μF
C_{13} 100 μF/40 V electrolytic

L_1 3 turns 6 mm ID 1.2 mm wire
L_2 2 cm wire 1.2 mm Ω (hair pin)
L_3 1.2 cm wire 1.2 mm Ω (hair pin)
L_4 3 turns 6 mm ID 1.2 mm wire
L_5 6 turns 8 mm ID 1.5 mm wire
L_6 6 turns 1.5 mm wire on ferrite core
L_7 10 μF chocke