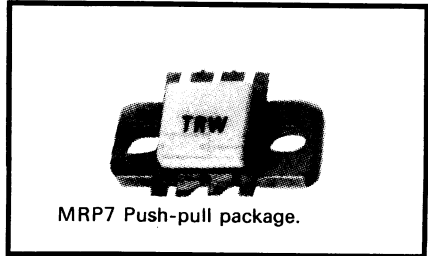


- 40 W
- 28 V
- 30 - 400 MHz
- RF Power
- Push-Pull Transistor
- NPN Silicon



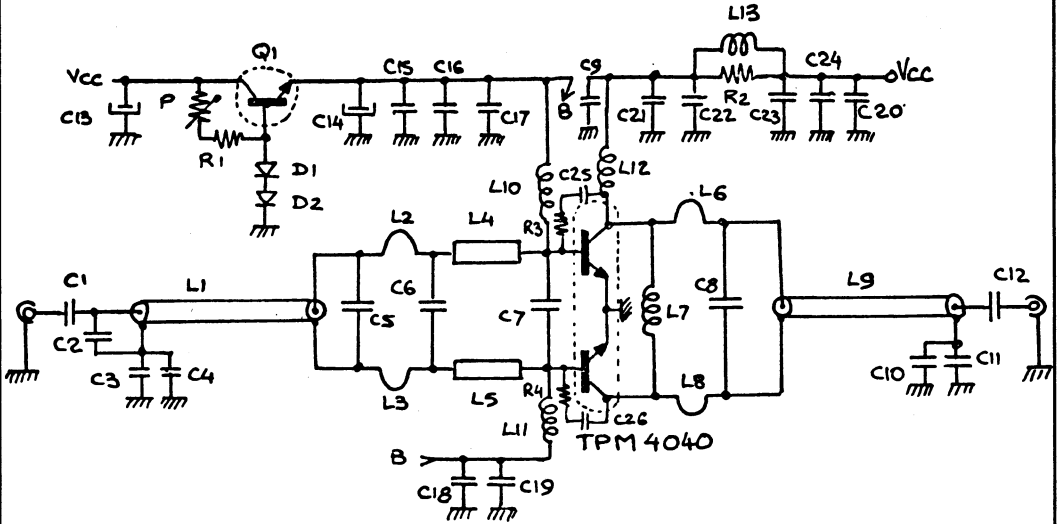
The TPM 4040 is an internally matched transistor on a push-pull package specially designed for multioctave bandwidth high gain and power applications. Its internal matching and package configuration lead to high input and output impedances.

Multicell die design and ultra thin beryllium oxide header allow optimum heat dissipation and operating efficiency. Long term reliability and ruggedness are guaranteed by diffused silicon ballast resistors and the TRW gold metallization process.

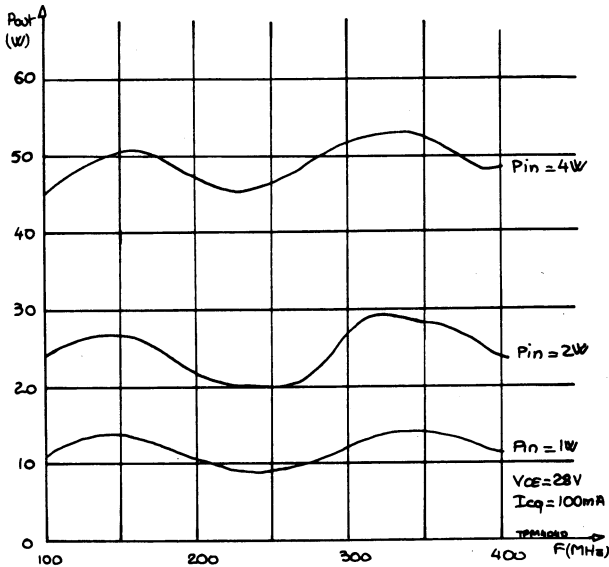
Electrical Characteristics (T_{case} = 25 °C)

	SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC Test	BV _{EBO}	Emitter - Base Breakdown Voltage	I _E = 6 mA	4			V
	BV _{CEO}	Collector - Emitter Breakdown Voltage	I _C = 40 mA	30			V
	BV _{CBO}	Collector - Base Breakdown Voltage	I _C = 20 mA	45			V
	H _{FE}	D.C. Current Gain	V _{CE} = 20 I _C = 500 mA	10			—
RF Test	P _G	RF Power Gain	V _{CE} = 28 V	10			dB
	η _C	Collector Efficiency	F = 400 MHz	50			%
	VSWR	Mismatch Tolerance	P _{out} = 40 W I _{cq} = 2 X 50 mA	∞			—
	C _{OB}	Collector - Base Capacitance (Each Side)	V _{CB} = 28 V F = 1 MHz			20	pF
Thermal	θ _{JC}	Thermal Resistance Junction Case	T _{case} = 70 °C			2	°C/W
	P _D	Power dissipated	T _{case} = 70 °C			65	W

100-400 MHz 40 W AMPLIFIER (Class AB)



Typical Pout vs Pin, F

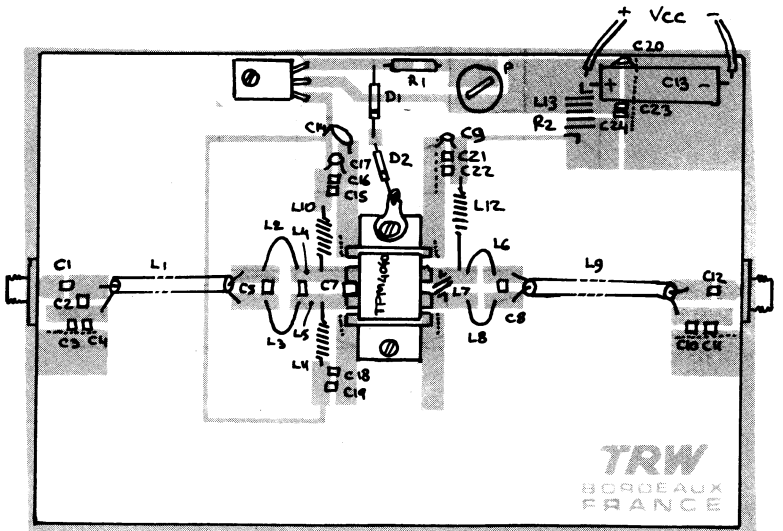


COMPONENTS PART LIST

C ₁ , C ₆ , C ₁₂	= 39 pF chip capacitor
C ₂	= 3.9 pF chip capacitor
C ₃ , C ₁₀ , C ₁₅ , C ₁₈ , C ₂₁ , C ₂₃	= 1000 pF chip capacitor
C ₄ , C ₁₁ , C ₁₆ , C ₁₉ , C ₂₂ , C ₂₄	= 15 nF chip capacitor
C ₅	= 22 pF chip capacitor
C ₇	= 68 pF chip capacitor
C ₈	= 15 pF chip capacitor
C ₂₅ , C ₂₆	= 10 nF ceramic disc capacitor
C ₁₄	= 10 μF/ 5 V Electrolytic capacitor
C ₁₃	= 100 μF/40 V Electrolic capacitor
C ₉ , C ₁₃ , C ₁₇ , C ₂₀	= 0.1 μF Tantal
L ₁ , L ₉	= 100 mm, 50 ohms teflon coaxial cable
L ₂ , L ₃	= hair pin L = 17 mm, 0.8 mm wire
L ₄ , L ₅	= 6 mm X 3 mm line on substrate
L ₆ , L ₈	= hair pin L = 12 mm, 0.8 mm wire
L ₇	= 3 turns ∅ 5 mm, 0.8 mm wire
L ₁₀ , L ₁₁ , L ₁₂	= 15 turns ∅ 3 mm 0.5 mm craneled wire
L ₁₃	= 6 turns ∅ 5 mm 1.2 mm wire
R ₁	= 1.2 K ohms 1/2 W
R ₂	= 15 ohms 1/2 W
R ₃ , R ₄	= 1 K ohms 1/4 W
D ₁ , D ₂	= 1 N 4007 or equivalent
Q ₁	= BD 135 or equivalent

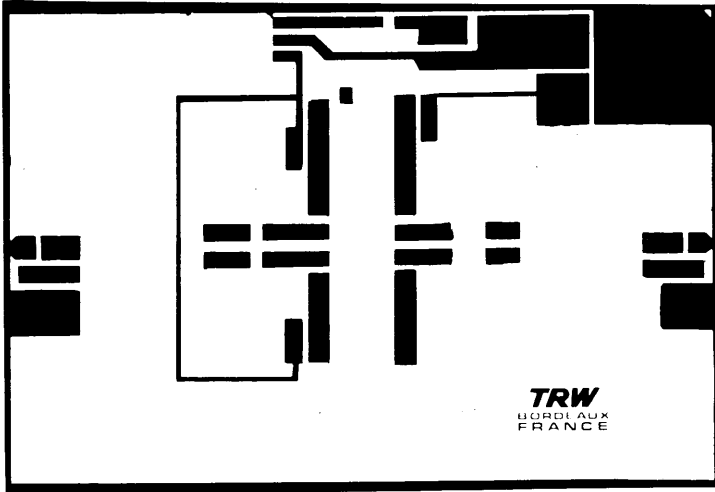
Substrate : teflon glass 1/50"

COMPONENTS LAYOUT

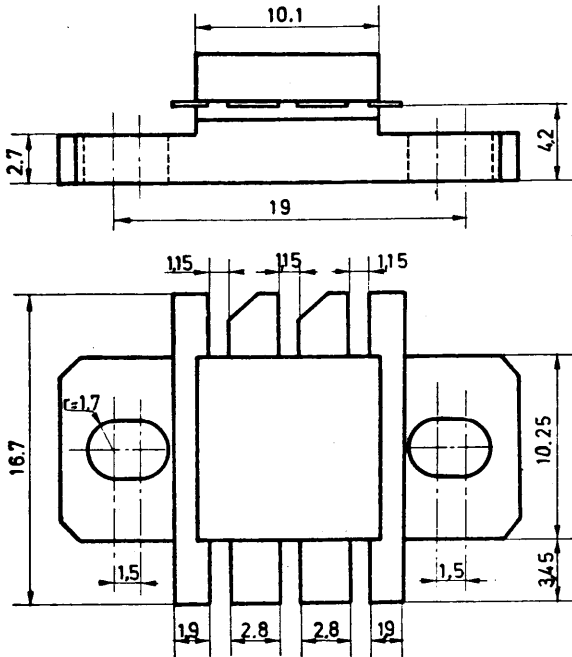


----- = grounding foil

PRINTED CIRCUIT BOARD

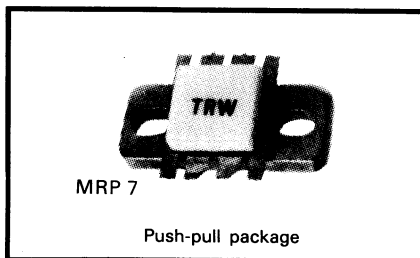


PACKAGE



Push-Pull Transistor

- 130 W
- 28 V
- 225 - 400 MHz
- RF Power
- Push-Pull Transistor
- NPN Silicon



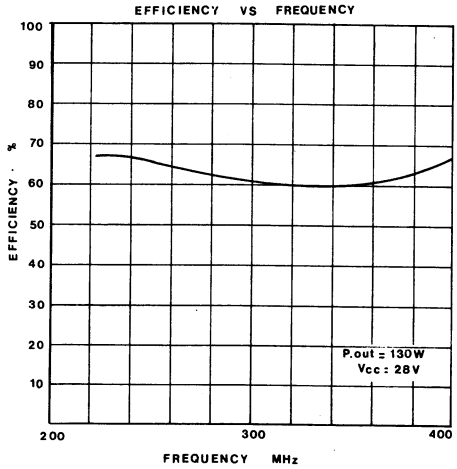
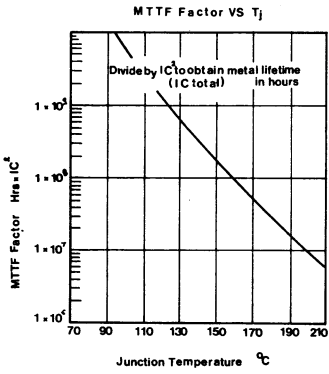
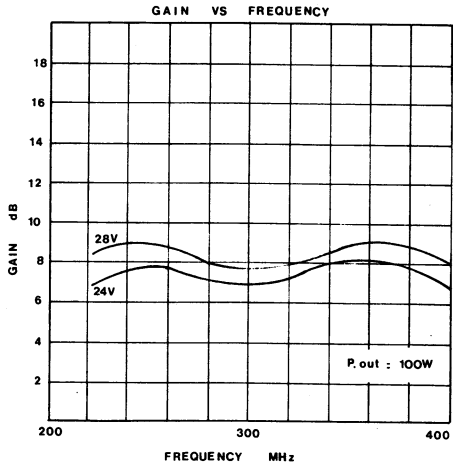
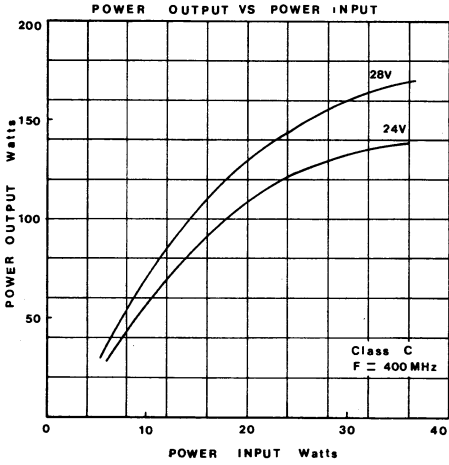
The TPM 4130 is an internally matched transistor on a push-pull package specially designed for multioctave bandwidth high power applications. Its internal matching and package configuration lead to high input and output impedances. Multicell die design and

ultra thin beryllium oxide header allow optimum heat dissipation and operating efficiency. Long term reliability and ruggedness are guaranteed by diffused silicon ballast resistors and the TRW gold metallization process.

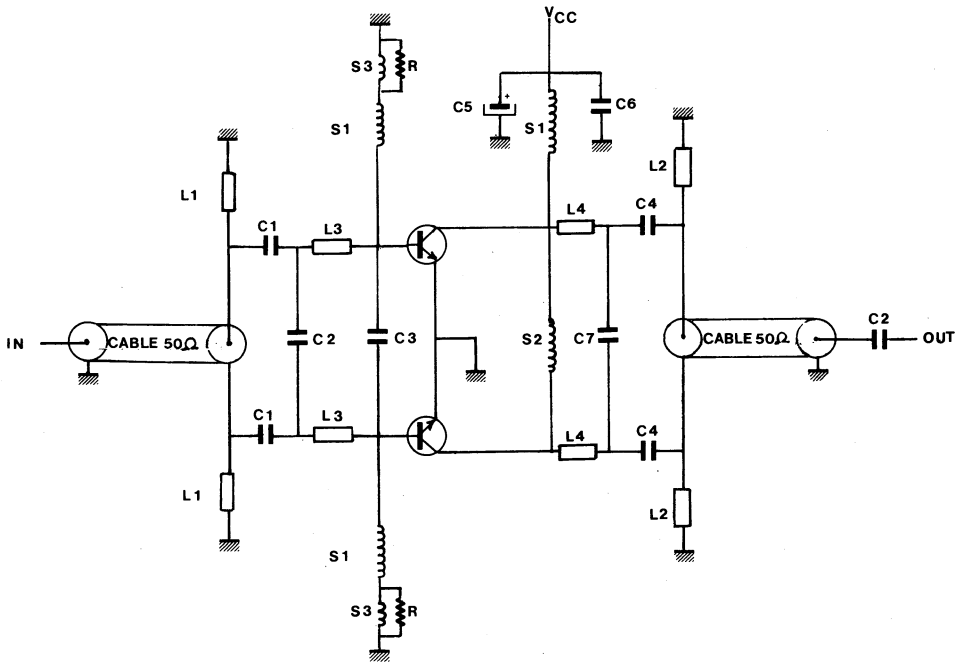
Electrical Characteristics (T_{CASE} = 25 °C)

	SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC TEST	BV _{EBO}	Emitter - Base Breakdown Voltage	I _E = 5 mA	3.5			V
	BV _{CEO}	Collector - Emitter Breakdown Voltage	I _C = 50 mA	30			V
	BV _{CBO}	Collector - Base Breakdown Voltage	I _C = 100 mA	65			V
	H _{FE}	D.C. Current Gain	V _{CE} = 5 V, I _C = 1 A	20		150	—
RF TEST	P _G	Power Gain	V _{CE} = 28 V, P _{OUT} = 130 W F = 400 MHz	7.2			dB
	η _C	Collector Efficiency	V _{CE} = 28 V, P _{OUT} = 130 W F = 400 MHz	60			%
	C _{OB}	Collector Base Capacitance (each side)	V _{CB} = 28 V, F = 1 MHz		60	70	pF
THERMAL	P _D	Maximal Total Dissipation	t _C = 25 °C			210	W
	I _C	Maximal Collector Current (each side)				10	A
	R _{TH}	Thermal Resistance Junction - Case	T-Case = 60 °C			0.85	°C/W

TYPICAL PERFORMANCE



SCHEMATIC TPM 4130



- $L_1 = L_4 = 30 \text{ mm } 50 \Omega$ teflon coaxial cable soldered on L_2 and L_{12} .
- $L_2 = L_3 = 24 \text{ mm} \times 1,5 \text{ mm}$ on substrate.
- $L_4 = L_5 = 6 \times 2,5 \text{ mm}$ on substrate.
- $L_9 =$ hair pin made with 24 mm of 5 mm wire (as close to the collectors as possible).
- $L_8 = 0,1 \text{ uH}$.
- $L_{10} = L_{11} = 8 \times 1,5 \text{ mm}$ on substrate.
- $L_{12} = L_{13} = 30 \text{ mm} \times 2,5 \text{ mm}$ on substrate.

Substrate teflon-glass 1/16". ($\epsilon_r = 2.55$).

- C_1 ATC 100B 39pF capacitors.
- C_2 ATC 100B 27pF capacitors.
- C_3 ATC 100B 47pF capacitor.
- C_4 ATC 100B 33pF capacitor.
- C_5 Electrolytic capacitor 10 μF 63V.
- C_6 Chip capacitor 100 nf.
- C_7 ATC 100B 22pF capacitor.
- S_1 Inductor 0.8 mm wire 3.6 mm id.
- S_2 Inductor 0,5 mm wire 24 mm long.
- S_3 Inductor 1 μH .
- R Resistor 10 $\Omega \pm 10\%$ 1/4 W.
- L_1 Microstrip lines 28.5 mm \times 1.5 mm.
- L_2 Microstrip lines 30 mm \times 2.5 mm.
- L_3 Microstrip lines 11 mm \times 2.5 mm.
- L_4 Microstrip lines 12 mm \times 2 mm.

Teflon coaxial 50 Ω \varnothing 1.8 mm 27.5 mm.