island labs

UHF POWER AMPLIFIER MODULES

A range of broadband UHF modules, primarily designed for mobile communication equipment, operating directly from 12 V electrical systems.
The BGY40,41 series produce minimum output powers of 7.5 W and 13 W respectively in the UHF communications bands, the 'A' types covering 400 to 440 MHz and the 'B' types covering 440 to 470 MHz.
The modules consist of a three-stage RF amplifier using n-p-n transistor chips with lumped element matching components in a plastic stripline encapsulation.
The negative supply is internally connected to the flange.

QUICK REFERENCE DATA

Mode of operation			cw	
Supply voltages	V_{S1}, V_{S2}	nom.	12.5	V
Input impedance	Z_i	nom.	50	Ω
Output load impedance	Z_L	nom.	50	Ω

RF performance

		BGY40A	BGY41A	BGY40B	BGY41B	
Frequency of operation	f	400 to 440		440 to 470		MHz
Typical drive power	P_D	75	150	100	150	mW
Typical load power	P_L	11.5	15.6	10	15	W
Typical efficiency	η	40	40	40	40	%

MECHANICAL DATA (see Fig. 15)

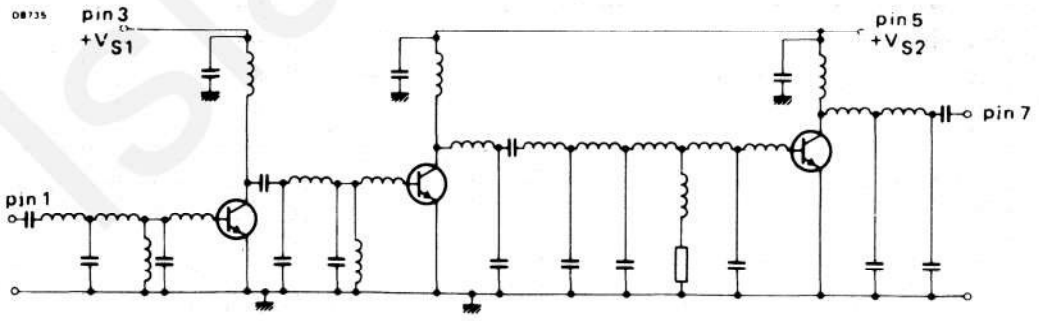


Fig. 1 Circuit of the UHF modules.

PRODUCT SAFETY This device incorporates beryllium oxide, the dust of which is toxic. The device is entirely safe provided that the BeO disc is not damaged.

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC134)

Voltages (with respect to flange)

DC supply terminals		V_{S1} and V_{S2}	max.	16.5	V
RF input terminal		$\pm V_{in}$	max.	25	V
RF output terminal		$\pm V_{out}$	max.	25	V
Load power (see Fig.2)	BGY40A, 40B	P_L	max.	12	W
	BGY41A, 41B	P_L	max.	16.5	W
Input drive power	BGY40A, 40B	P_D	max.	150	mW
	BGY41A, 41B	P_D	max.	200	mW
Storage temperature range		T_{stg}		−40 to +100	°C
Operating heatsink temperature		T_h	max.	90	°C

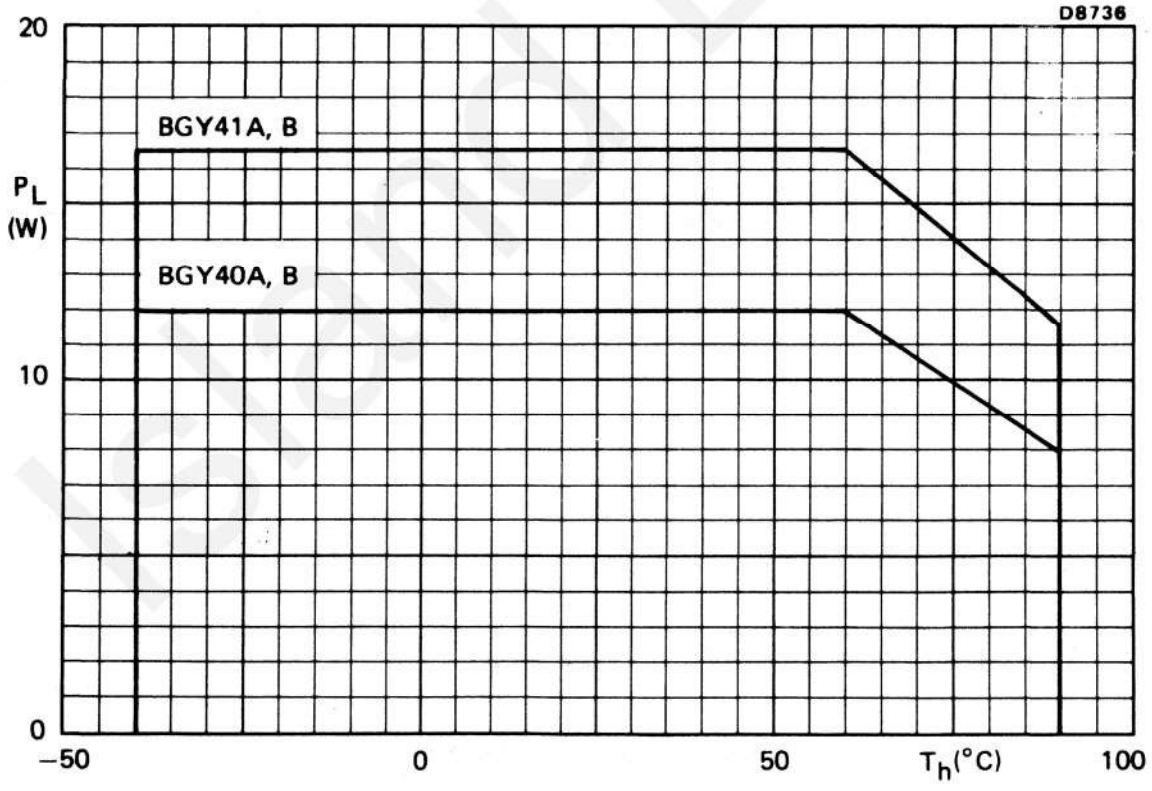


Fig.2 Load power derating; VSWR = 1

CHARACTERISTICS

T_h = 25 °C unless otherwise specified;

$V_{S1} = V_{S2}$ = 12.5 V; R_S = 50 Ω; R_L = 50 Ω

		BGY40A	BGY41A	BGY40B	BGY41B	
Frequency of operation	f	400 to 440		440 to 470		MHz
Minimum load power	P_L	7.5	13	7.5	13	W
Nominal drive power	P_D	100	150	100	150	mW
Minimum efficiency	η	35	35	35	35	%
Typical load power	P_L	11.5	15.6	10	15	W
Typical drive power	P_D	75	150	100	150	mW
Typical efficiency	η	40	40	40	40	%

Harmonic output Any single harmonic will be at least 40 dB down from the carrier.

Input VSWR (with respect to 50 Ω) typ. 1.5

Stability

The modules are stable with load VSWR up to 3 (all phases) when operated within the following limits:

BGY40A, BGY40B	BGY41A, BGY41B
P_D = 30 to 150 mW	P_D = 30 to 200 mW
$V_{S1} = V_{S2}$ = 8 to 16.5 V	$V_{S1} = V_{S2}$ = 8 to 16.5 V
P_L = 5 to 12 W	P_L = 5 to 16.5 W

Ruggedness

The modules will withstand load VSWR of 50 (all phases) for short period overload conditions with P_D, V_{S1} and V_{S2} at maximum values, providing the combination does not result in the matched RF output power rating being exceeded.

Mounting

To ensure good thermal transfer, the module should be mounted onto a heatsink with a flat surface, with heat conducting compound between module and heatsink. If an isolation washer is used, heatsink compound should be applied to both sides of the washer. Burrs and thickening of the holes in the heatsink should be removed and 3 mm bolts tightened to a torque of 0.5 Nm.
Devices may be soldered directly into a circuit using a soldering iron with a maximum temperature of 245 °C for not more than 10 seconds at a distance of at least 1 mm from the plastic.

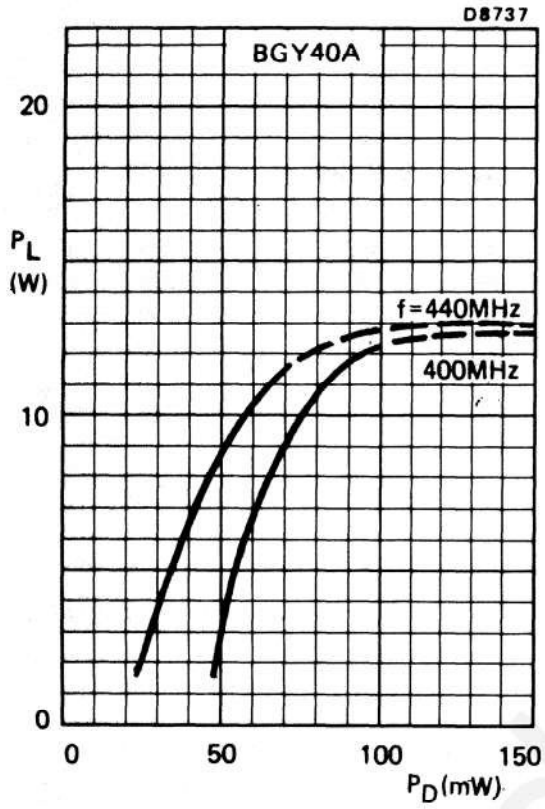


Fig.3 Typical values; $V_{S1} = V_{S2} = 12.5$ V

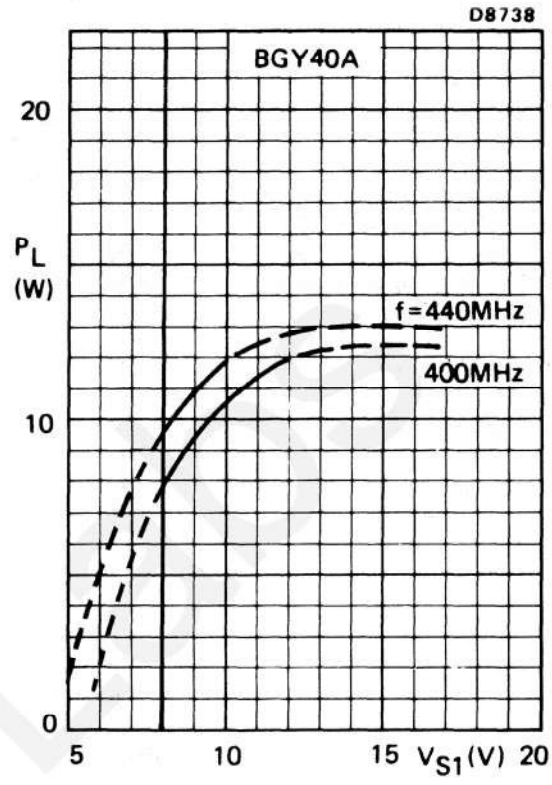


Fig.4 Typical values; $V_{S2} = 12.5$ V; $P_D = 100$ mW

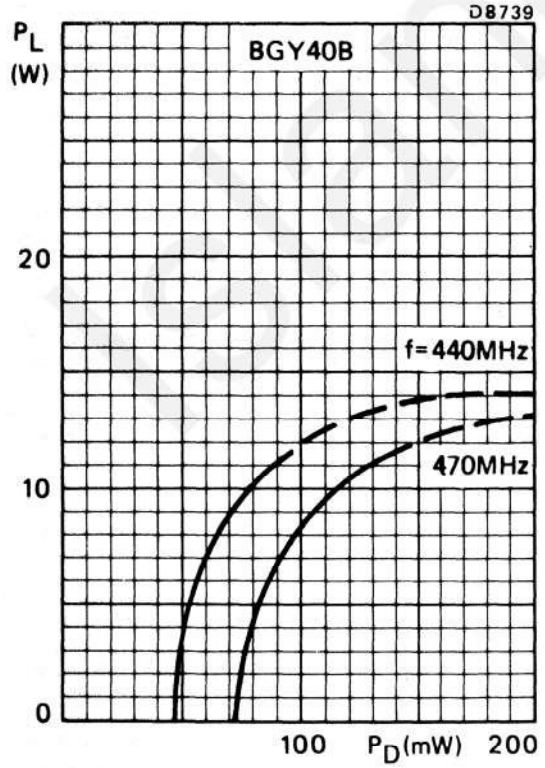


Fig.5 Typical values; $V_{S1} = V_{S2} = 12.5$ V

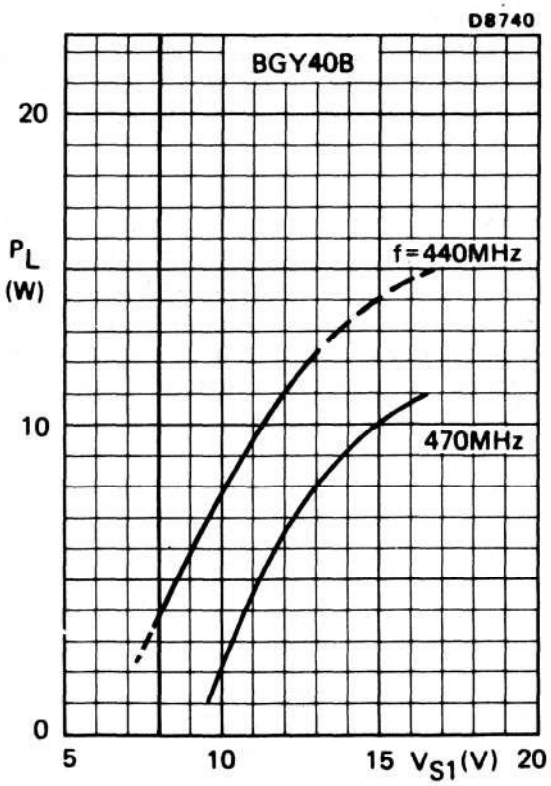


Fig.6 Typical values; $V_{S2} = 12.5$ V; $P_D = 100$ mW

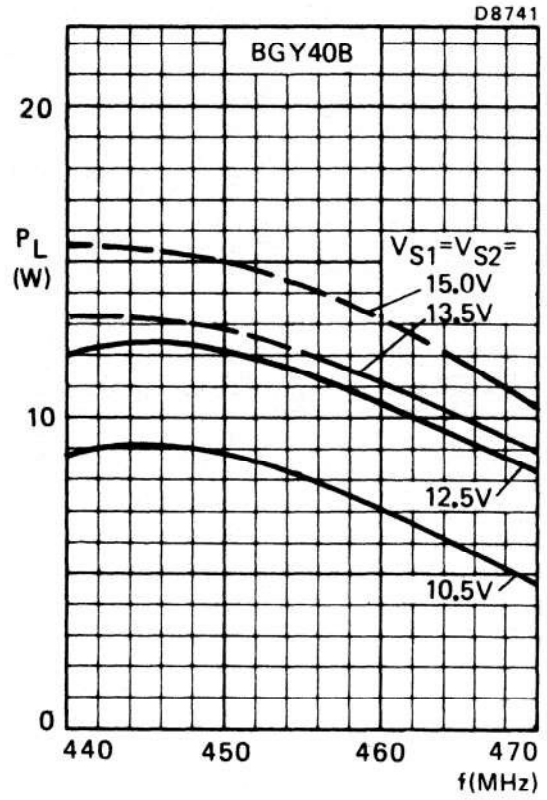


Fig.7 Typical values; P_D = 100 mW

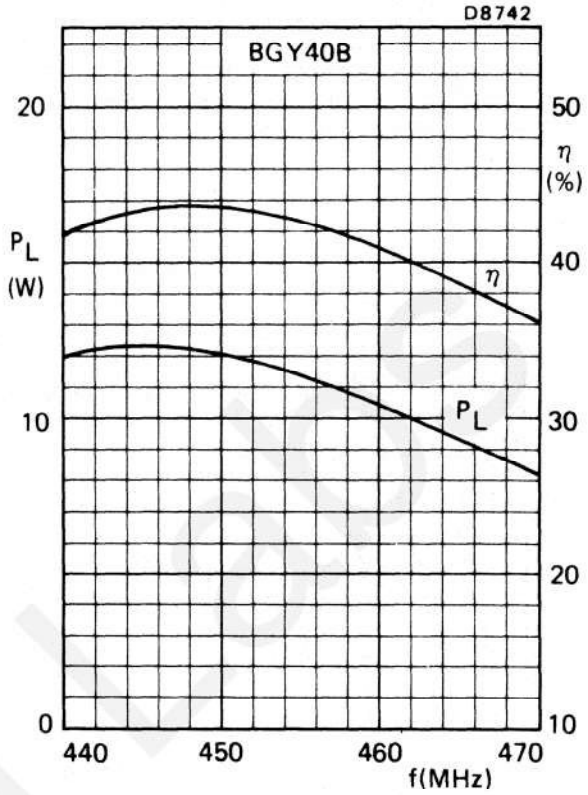


Fig.8 Typical values; V_{S1} = V_{S2} = 12.5 V; P_D = 100 mW

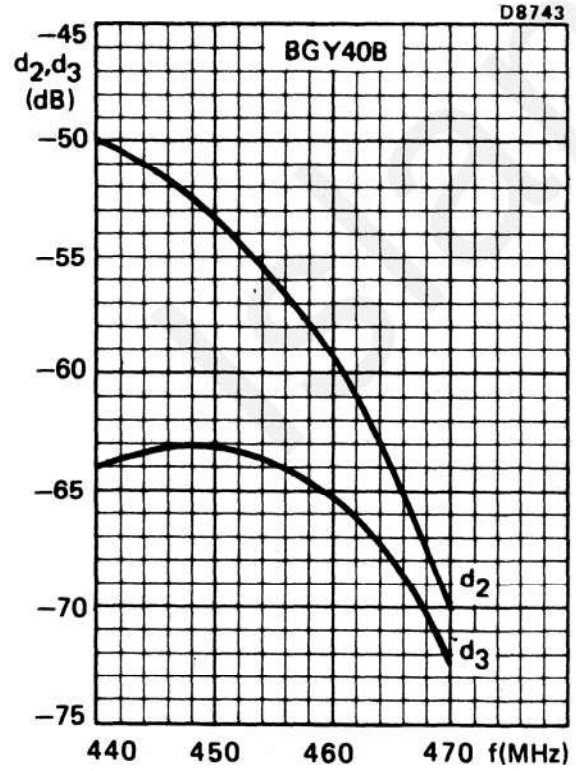


Fig.9 Typical values; V_{S1} = V_{S2} = 12.5 V; P_D = 100 mW

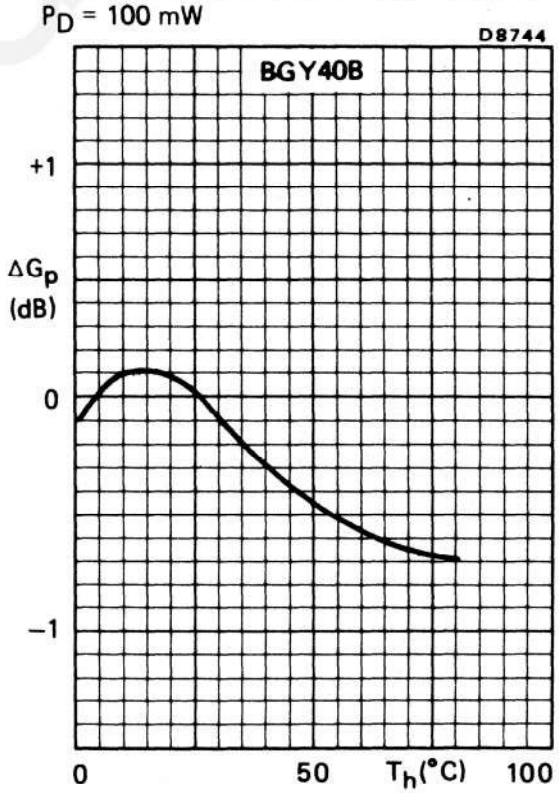


Fig.10 Typical values; V_{S1} = V_{S2} = 12.5 V; P_D = 100 mW

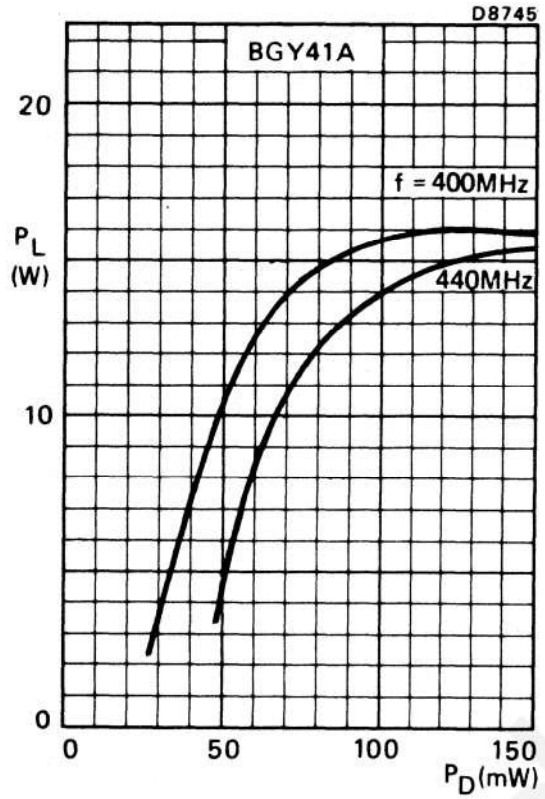


Fig.11 Typical values; $V_{S1} = V_{S2} = 12.5$ V

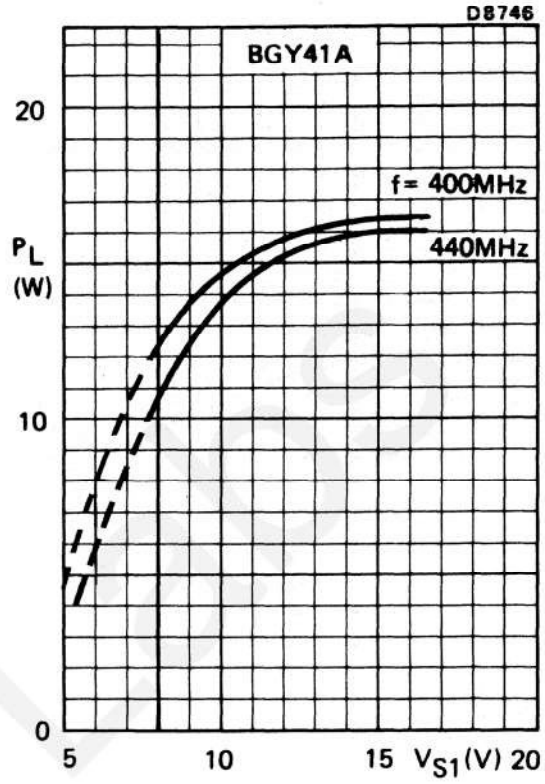


Fig.12 Typical values; $V_{S2} = 12.5$ V; $P_D = 150$ mW

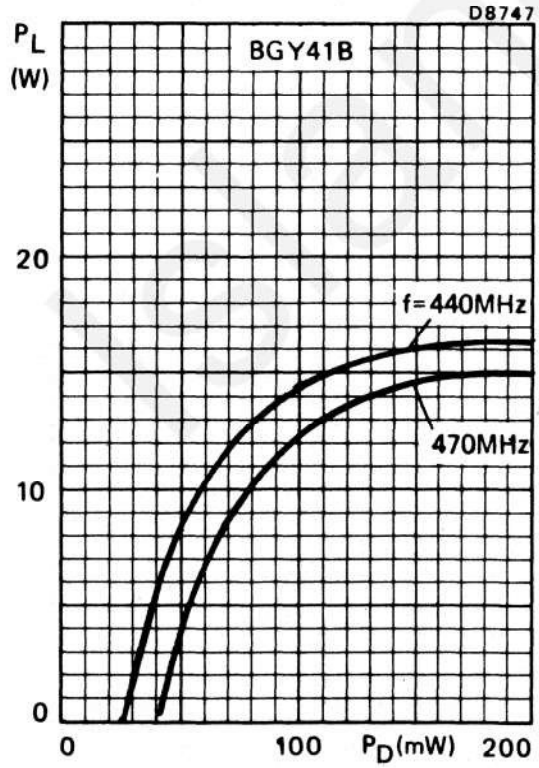


Fig.13 Typical values; $V_{S1} = V_{S2} = 12.5$ V

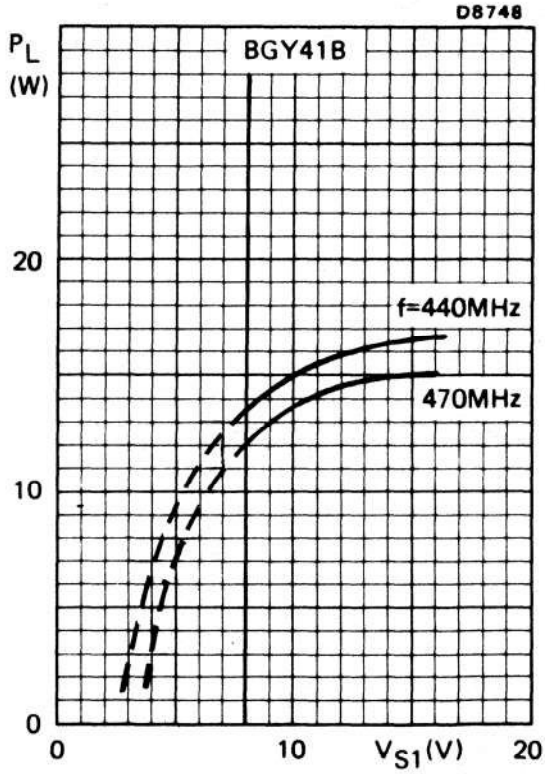
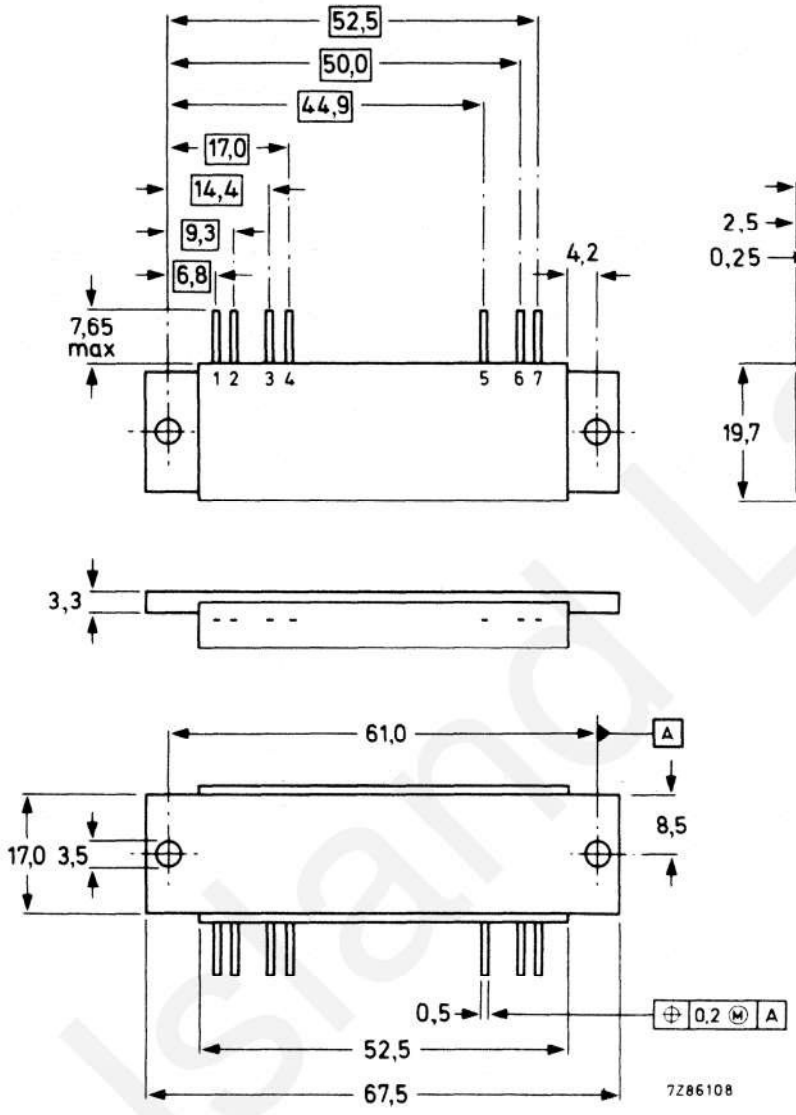


Fig.14 Typical values; $V_{S2} = 12.5$ V; $P_D = 150$ mW

MECHANICAL DATA

Dimensions in mm

Fig. 15 SOT-132C.



Lead reference

1 = Input
2 = Earth
3 = V_{S1}
4 = Earth
5 = V_{S2}
6 = Earth
7 = Output