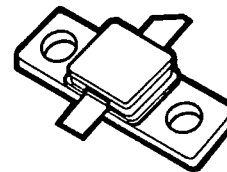


MRAL2023-1.5H, MRAL2023-3H, MRAL2023-6H, MRAL2023-12H

MICROAMP® S-Band Class C Power Transistors

T-33-11

- 1.5 to 12 Watts, 22V Operation
- Broadband 2000-2300 MHz
- Internally Compensated*
- Gold Metalized
- Diffused Ballast Resistors
- MTTF Data
- "TX" Screenable



HLP-11

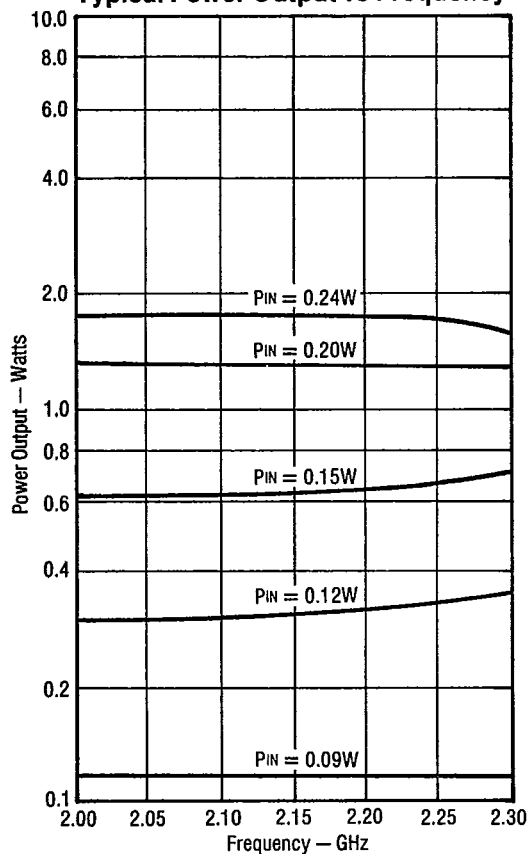
Electrical Characteristics at T_{FLANGE} = 25°C

| SYMBOL | CHARACTERISTICS | MRAL2023-1.5H | MRAL2023-3H | MRAL2023-6H | MRAL2023-12H |
|-----------------------------------|--|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| BV _{CES} | Collector-Emitter Breakdown Voltage | I _C = 10mA 42V Min | I _C = 20mA 42V Min | I _C = 50mA 42V Min | I _C = 100mA 42V Min |
| BV _{EBO} | Emitter-Base Breakdown Voltage | I _E = 0.2mA 3.5V Min | I _E = 0.4mA 3.5V Min | I _E = 1.0mA 3.5V Min | I _E = 2.0mA 3.5V Min |
| I _{CBO} | Collector Cutoff Current I _E = 0 | V _{CB} = 22V 0.25mA | V _{CB} = 22V 0.5mA | V _{CB} = 22V 1.25mA | V _{CB} = 22V 2.5mA |
| | | V _{CB} = 38V 0.5mA | V _{CB} = 38V 1.0mA | V _{CB} = 38V 2.5mA | V _{CB} = 38V 5.0mA |
| I _C | Max. Continuous Collector Current V _{CE} = 4V | 0.25A | 0.5A | 1.25A | 2.5A |
| h _{FE} | Forward Current Transfer Ratio V _{CE} = 5V | I _C = 0.1A 10-90 | I _C = 0.2A 10-90 | I _C = 0.5A 10-90 | I _C = 1.0A 10-90 |
| θ _{JF} | Thermal Resistance Junction to Flange (at Rated RF Output) | 30°C/W | 16°C/W | 8°C/W | 4.5°C/W |
| P _O | Min. Broadband Power Output | 1.5W | 3.0W | 6.0W | 12.0W |
| C _{OB} | Max. Collector-Base Capacitance V _{CB} = 22V; f = 1MHz | 3.5pF | 5pF | Internal Shunt L | Internal Shunt L |
| P _{G(dB)} | Min. Power Gain in dB V _{CB} = 22V | P _O = 1.5W 8.0dB | P _O = 3.0W 8.0dB | P _O = 6.0W 6.8dB | P _O = 12.0W 6.8dB |
| η _C | Min. Broadband Collector Efficiency | P _O = 1.5W 35% | P _O = 3.0W 40% | P _O = 6.0W 40% | P _O = 12.0W 40% |
| T _J & T _{STG} | Maximum Junction and Storage Temperatures: -65 to +200°C | | | | |

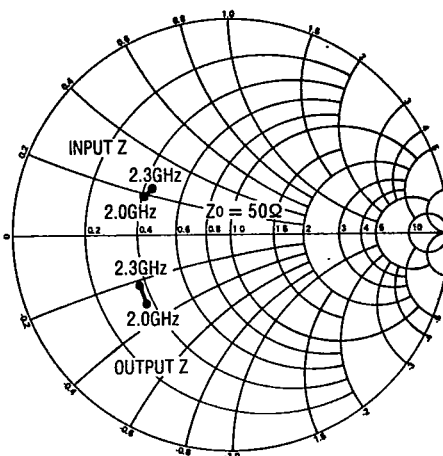
*The concept of input and/or matching using MOS capacitors, wire bonds and other techniques is patented by TRW, Inc. (US #3,713,006).

MRAL 2023-1.5H, 1.5 Watts Broadband Hermetic

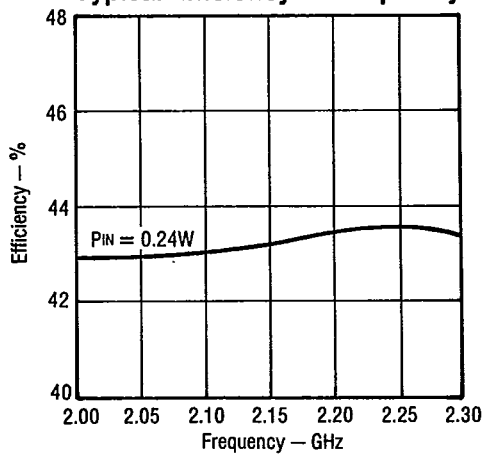
Typical Power Output vs Frequency



Impedance Data



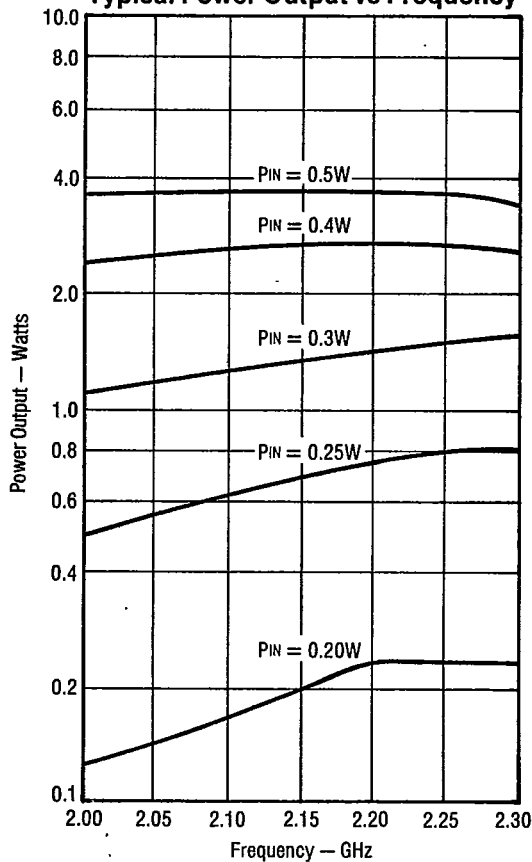
Typical Efficiency vs Frequency



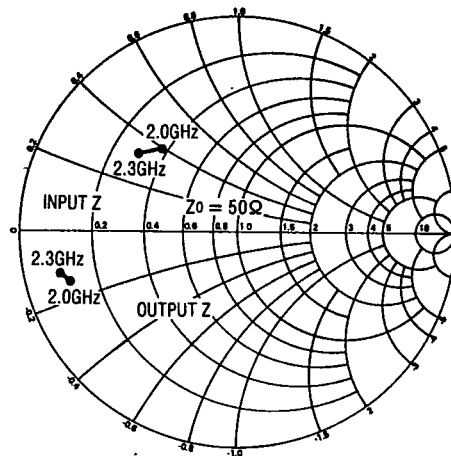
MRAL 2023 "H" Series T-33-11

MRAL 2023-3H, 3 Watts Broadband Hermetic

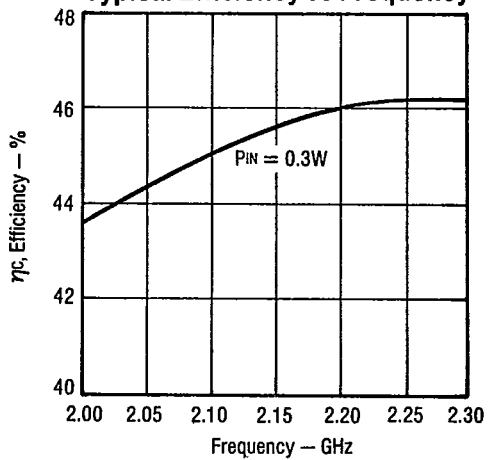
Typical Power Output vs Frequency



Impedance Data



Typical Efficiency vs Frequency

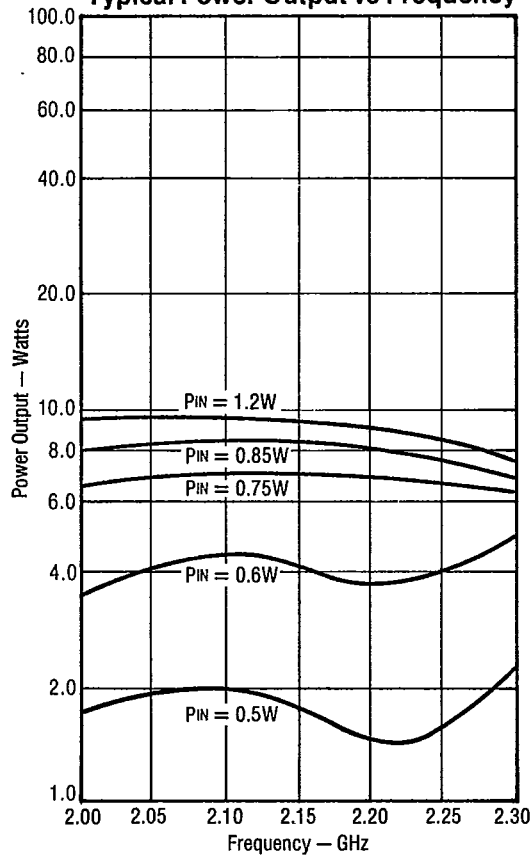


MRAL 2023 "H" Series

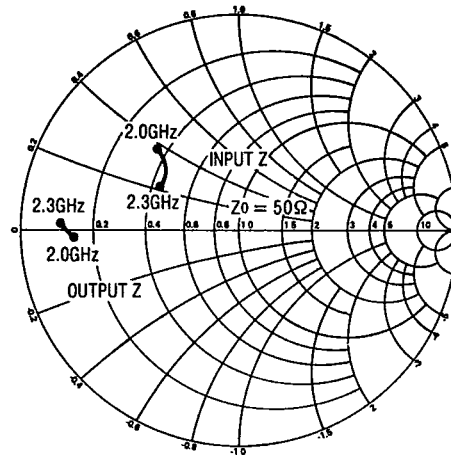
T-33-11

MRAL 2023-6H, 6 Watts Broadband Hermetic

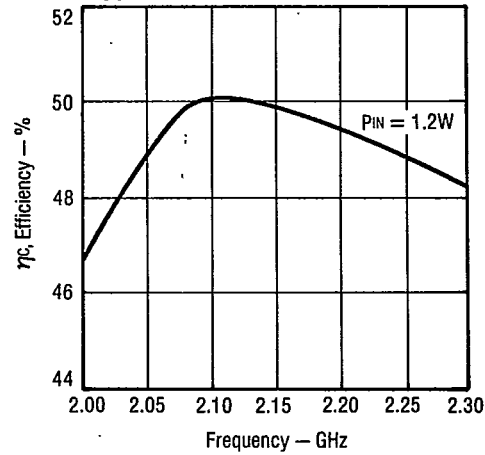
Typical Power Output vs Frequency



Impedance Data



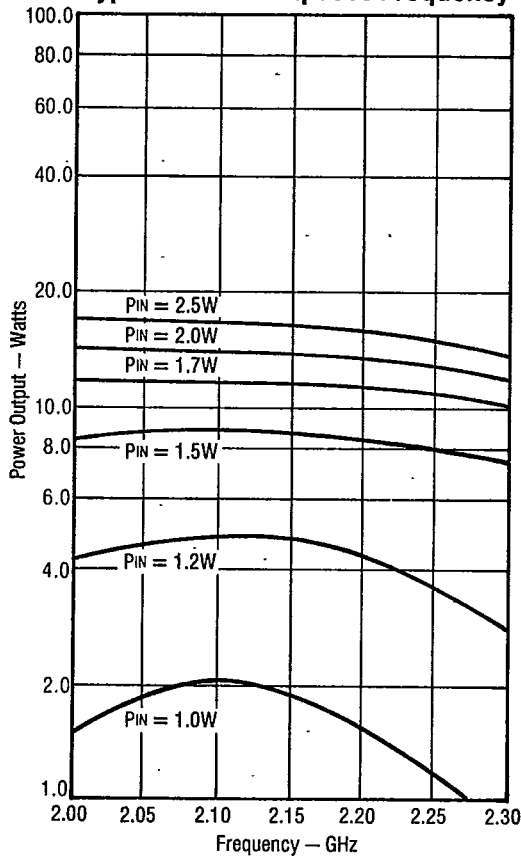
Typical Efficiency vs Frequency



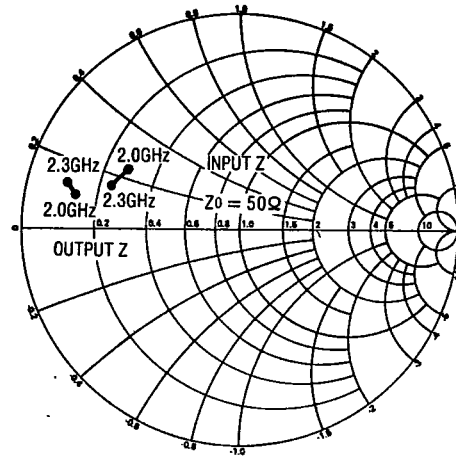
MRAL 2023 "H" Series T-33-11

MRAL 2023-12H, 12 Watts Broadband Hermetic

Typical Power Output vs Frequency

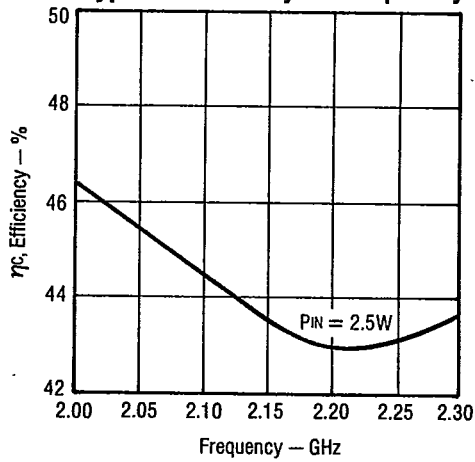


Impedance Data



Test circuit details available from TRW Semiconductors.

Typical Efficiency vs Frequency

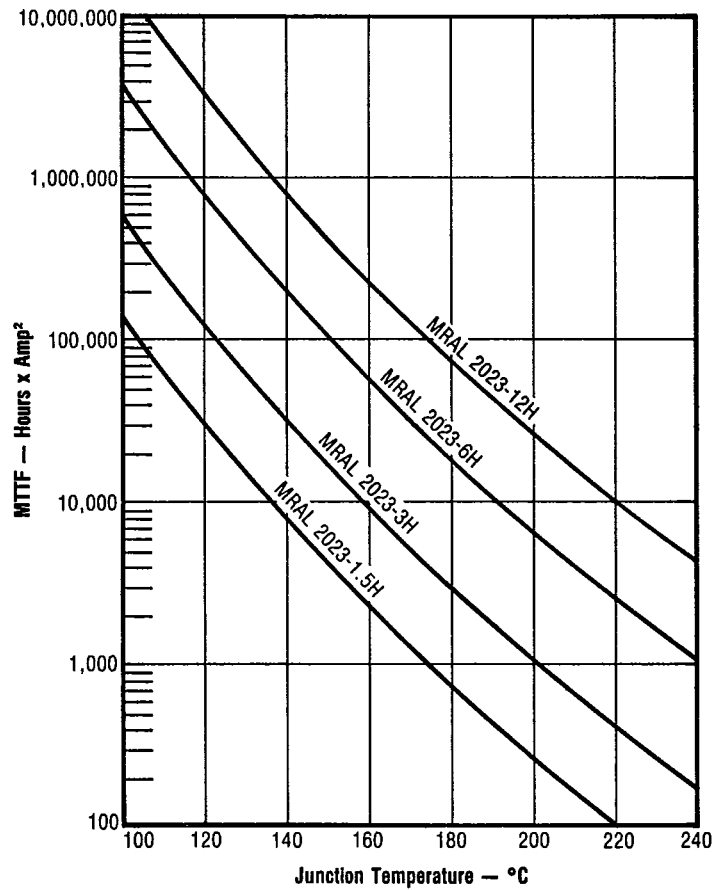


MRAL 2023 "H" Series

T-33-11

MTTF FACTOR (Normalized to 1 Ampere² Continuous Duty)

The graph shown below displays MTTF in hours × ampere² emitter current for each of the devices. Life tests at elevated temperatures have correlated to better than ±10% to the theoretical prediction for metal failure. Divide MTTF by I_c^2 for actual MTTF in a particular application.



HLP-11 Series Package

