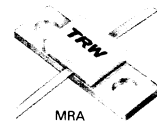


PRELIMINARY

The MRP 0912 series offers a complete family of broadband high power devices for pulsed application in the 0.9 - 1.2 GHz band. Using internal compensation, the MRP 0912 series is intended for use in IFF, DME, TACAN and transponder applications.

All units are gold metallized for longevity and resistance to metal migrations. They are emitter balasted with diffused silicon resistors for reliability and ruggedness.

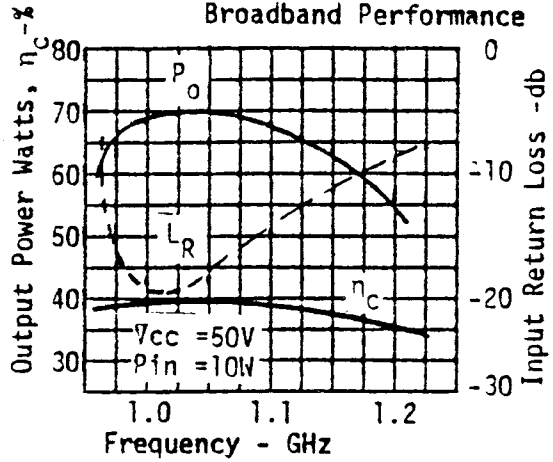
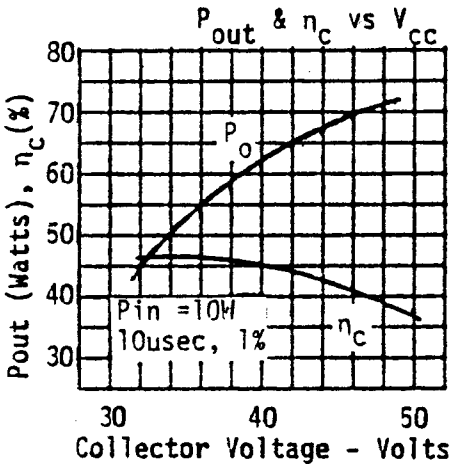
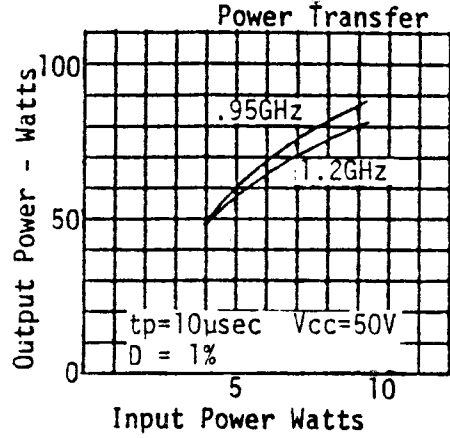
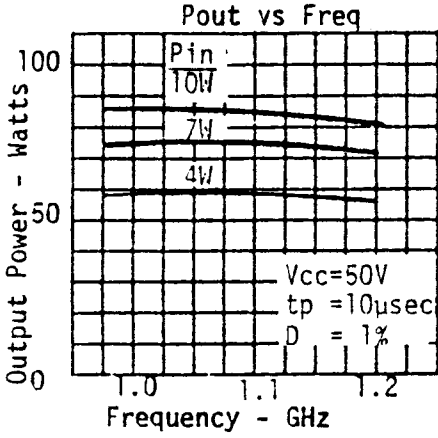
960 - 1215 MHz
 50 W PULSE POWER
 50 V
 GOLD RELIABILITY



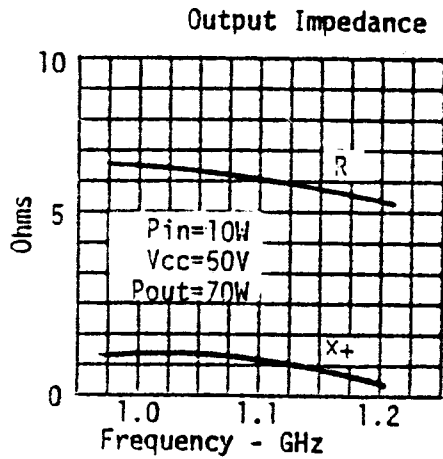
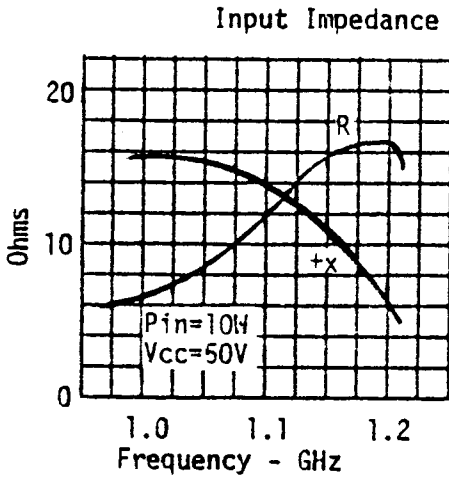
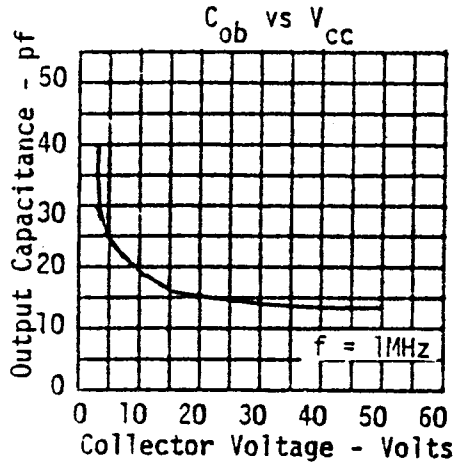
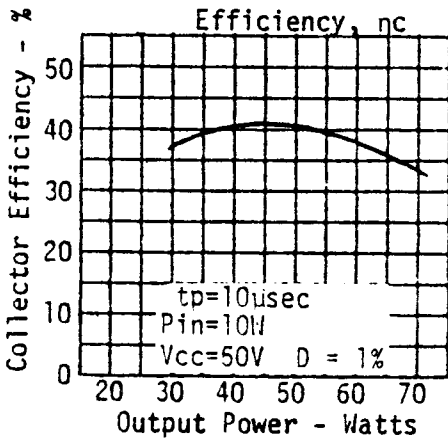
Electrical Characteristics ($T_{case} = 25^{\circ}C$)

	SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC TEST	BV_{CES}	Collector - Emitter Breakdown Voltage	$I_C = 10 \text{ mA}$	65			V
	BV_{EBO}	Emitter - Base Breakdown Voltage	$I_E = 5 \text{ mA}$	3.5			V
	H_{FE}	D.C. Current Gain	$V_{CB} = 5 \text{ V}$ $I_C = 1 \text{ A}$	15		100	—
RF TEST	P_{out}	Output Power	$V_{CB} = 50 \text{ V}$ RF Pulse : 10 μsec 1 % D.C. $P_{in} = 10 \text{ W}$ F = 960-1 215 MHz	50			W
	I_C	Collector Current	$V_{CB} = 50 \text{ V}$ RF Pulse : 10 μsec 1 % D.C. $P_{in} = 10 \text{ W}$ F = 960-1 215 MHz			2.85	A
DESIGN RATINGS	P_T	Power Dissipation				31	W
	I_C	Continuous Collector Current				4	A
	θ_{JC}	Thermal Resistance			5.7		$^{\circ}C/W$
	T_{STG}	Storage Temperature		- 65		+ 200	$^{\circ}C$

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



DESIGN RATINGS

MTTF (typ) (See Note # 1)

2.41×10^5 hr-amp²

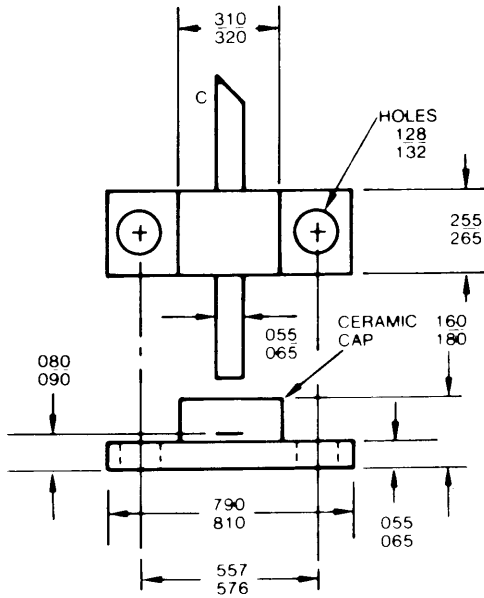
NOTE # 1 : Based on Metal Migration Theory,

MTTF = $(8.65 \times 10^{-6/t}) \text{ EXP } [11376/T_j (^{\circ}\text{K})]$

TABLE I

TRANSIENT θ_{JF}	
τ_{on}	θ_{JF}
μsec	$^{\circ}\text{C/W}$
10^{-1}	.0825
10^0	.244
10^1	.607
10^2	1.40
10^3	2.39
10^4	3.83
10^5	5.01
$\geq 10^6$	5.70

MRA

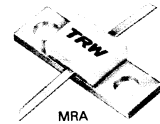


PRELIMINARY

The MRP 0912 series offers a complete family of broadband high power devices for pulsed application in the 0.9 - 1.2 GHz band. Using internal compensation, the MRP 0912 series is intended for use in IFF, DME, TACAN and transponder applications.

All units are gold metallized for longevity and resistance to metal migrations. They are emitter balasted with diffused silicon resistors for reliability and ruggedness.

960 - 1215 MHz
250 W PULSE POWER
50 V
GOLD RELIABILITY

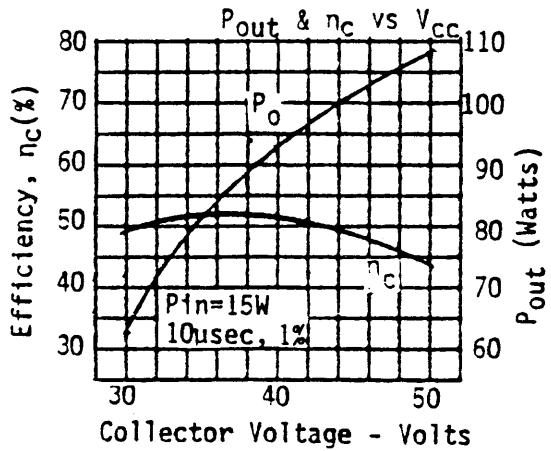
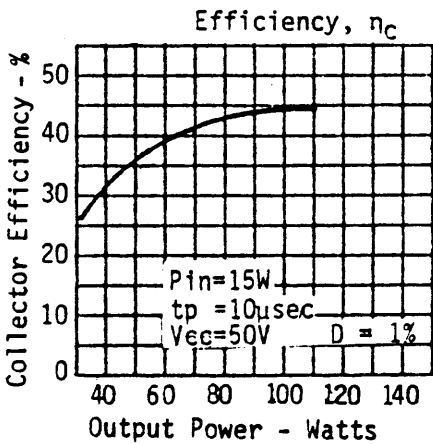
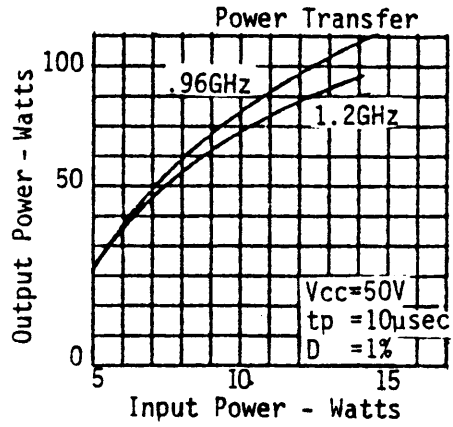
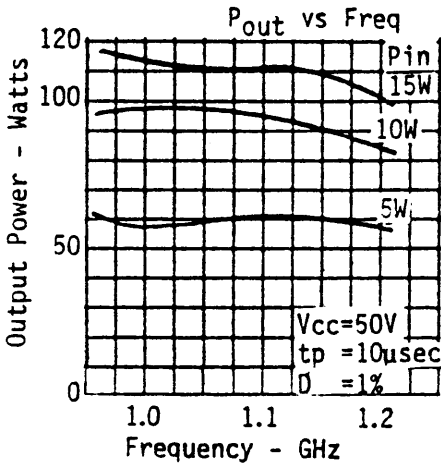


MRA

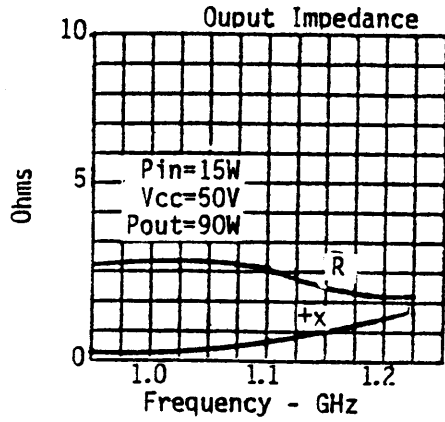
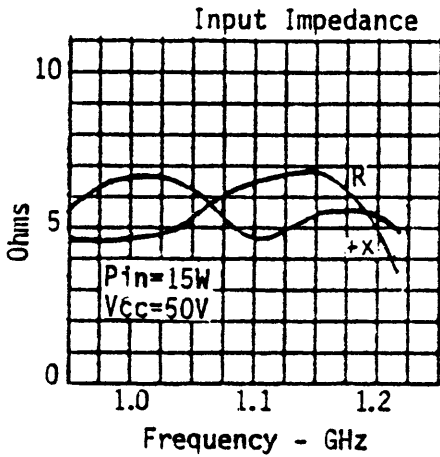
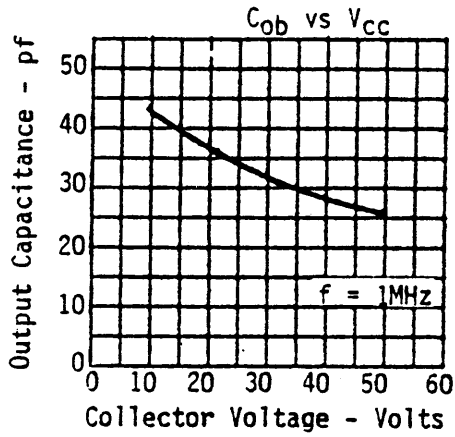
Electrical Characteristics ($T_{case} = 25^{\circ}C$)

	SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC TEST	BV_{CES}	Collector - Emitter Breakdown Voltage	$I_C = 20 \text{ mA}$	65			V
	BV_{EBO}	Emitter - Base Breakdown Voltage	$I_E = 5 \text{ mA}$	3.5			V
	H_{FE}	D.C. Current Gain	$V_{CE} = 5 \text{ V}$ $I_C = 1 \text{ A}$	15		100	—
RF TEST	P_{out}	Output Power	$V_{CB} = 50 \text{ V}$ RF Pulse : 10 μsec 1 % D.C. $P_{in} = 15 \text{ W}$ F = 960-1 215 MHz	75			W
	I_C	Collector Current	$V_{CB} = 50 \text{ V}$ RF Pulse : 10 μsec 1 % D.C. $P_{in} = 15 \text{ W}$ F = 960-1 215 MHz			4.28	A
DESIGN RATINGS	P_T	Power Dissipation				56	W
	I_C	Continuous Collector Current				8	A
	θ_{JC}	Thermal Resistance			3.1		$^{\circ}C/W$
	T_{STG}	Storage Temperature		- 65		+ 200	$^{\circ}C$

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



DESIGN RATINGS

MTTF (typ) (See Note # 1)

$$9.64 \times 10^5 \text{ hr-amp}^2$$

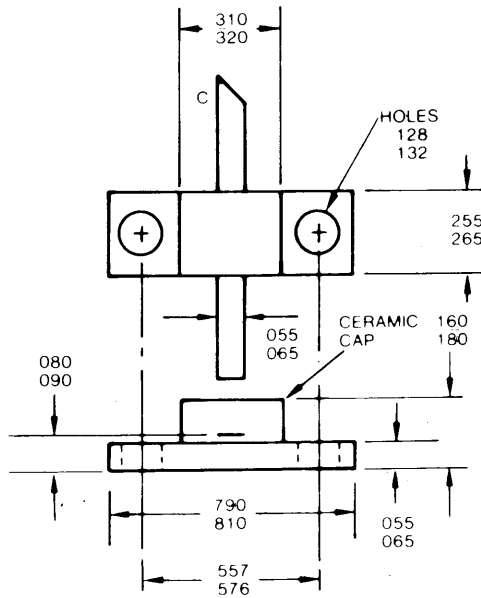
NOTE # 1 : Based on Metal Migration Theory,

$$\text{MTTF} = (3.46 \times 10^{-5/12}) \text{ EXP } [11376/T_j \text{ (}^\circ\text{K)}]$$

TABLE I

TRANSIENT θ_{JF}	
on	θ_{JF}
μsec	$^\circ\text{C/W}$
10^{-1}	.0413
10^0	.127
10^1	.321
10^2	.750
10^3	1.30
10^4	2.09
10^5	2.75
$\geq 10^6$	3.12

MRA



PRELIMINARY

The MRP 0912 series offers a complete family of broadband high power devices for pulsed application in the 0.9 - 1.2 GHz band. Using internal compensation, the MRP 0912 series is intended for use in IFF, DME, TACAN and transponder applications.

All units are gold metallized for longevity and resistance to metal migrations. They are emitter balasted with diffused silicon resistors for reliability and ruggedness.

960 - 1215 MHz
150 W PULSE POWER
50 V
GOLD RELIABILITY

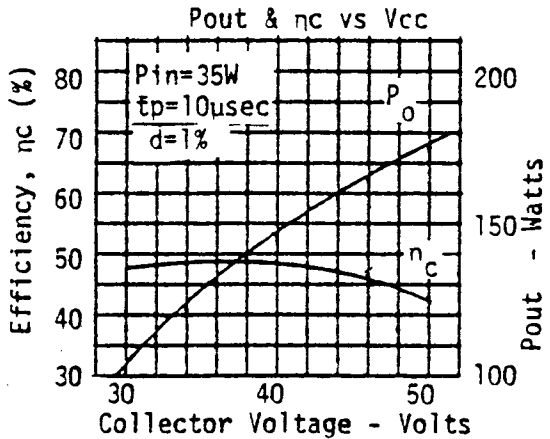
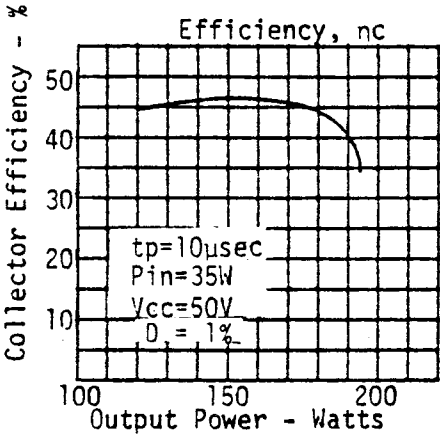
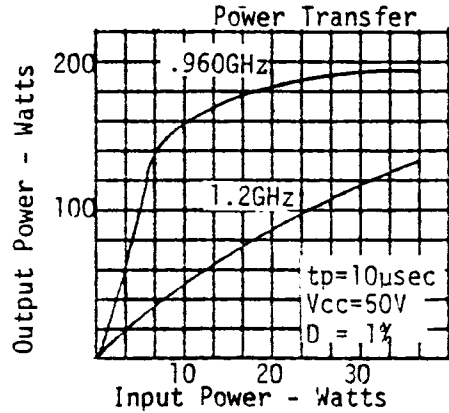
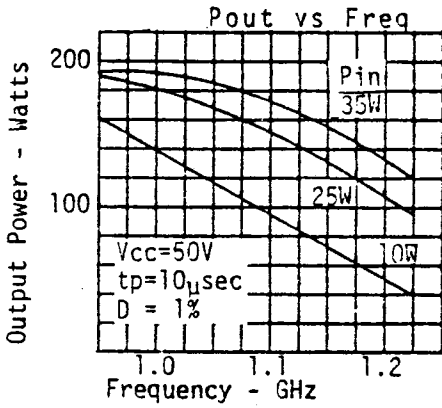
MRP



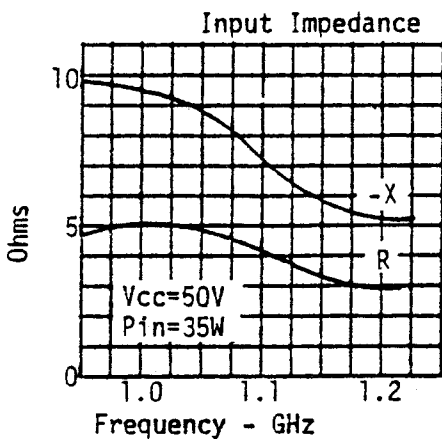
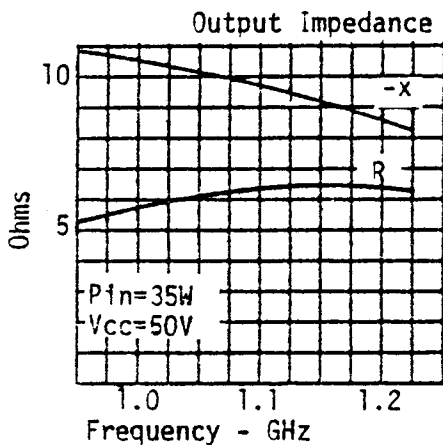
Electrical Characteristics (T_{case} = 25 °C)

	SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC TEST	BV _{CES}	Collector - Emitter Breakdown Voltage	I _C = 30 mA	65			V
	BV _{EBO}	Emitter - Base Breakdown Voltage	I _E = 5 mA	3.5			V
	H _{FE}	D.C. Current Gain	V _{CE} = 10 V I _C = 1 A	15		100	—
RF TEST	P _{out}	Output Power	V _{CB} = 50 V RF Pulse : 10 μsec 1 % D.C. P _{in} = 35 W f = 1 150 MHz	150			W
	I _C	Collector Current	V _{CB} = 50 V RF Pulse : 10 μsec 1 % D.C. P _{in} = 35 W f = 1 150 MHz			10	A
DESIGN RATINGS	P _T	Power Dissipation				77	W
	I _C	Continuous Collector Current				15	A
	θ _{JC}	Thermal Resistance			2.3		°C/W
	T _{STG}	Storage Temperature		- 65		+ 200	°C

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



DESIGN RATINGS

MTTF (typ) (See Note # 1)
 2.17×10^6 hr-amp²

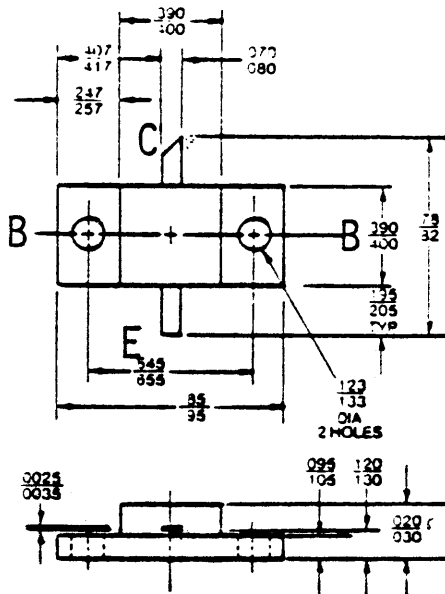
NOTE # 1 : Based on Metal Migration Theory,

$$MTTF = (7.79 \times 10^{-5/12}) \text{ EXP } [11376/T_j (\text{°K})]$$

TABLE I

TRANSIENT θ_{JF}	
on	θ_{JF}
μsec	°C/W
10^{-1}	.0275
10^0	.089
10^1	.231
10^2	.547
10^3	.95
10^4	1.52
10^5	2.01
$\geq 10^6$	2.28

MRP

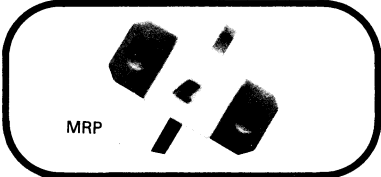


PRELIMINARY

The MRP 0912 series offers a complete family of broadband high power devices for pulsed application in the 0.9 - 1.2 GHz band. Using internal compensation, the MRP 0912 series is intended for use in IFF, DME, TACAN and transponder applications.

All units are gold metallized for longevity and resistance to metal migrations. They are emitter balasted with diffused silicon resistors for reliability and ruggedness.

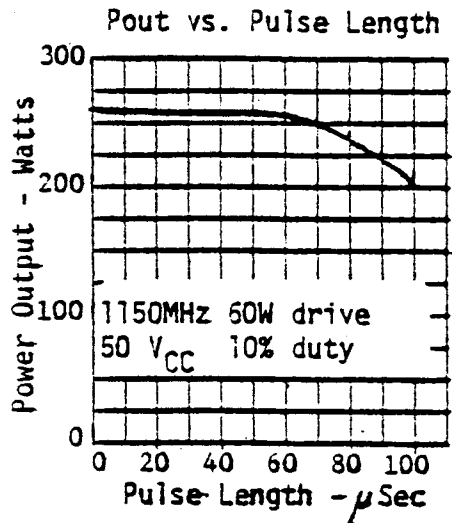
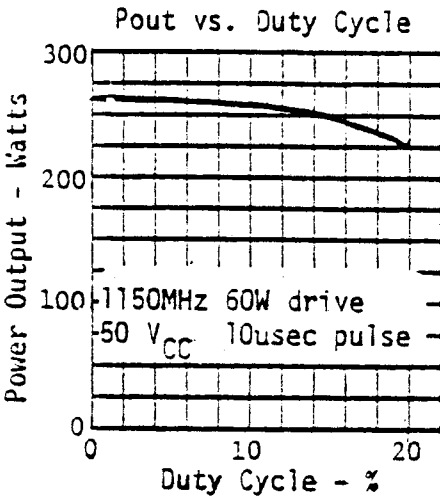
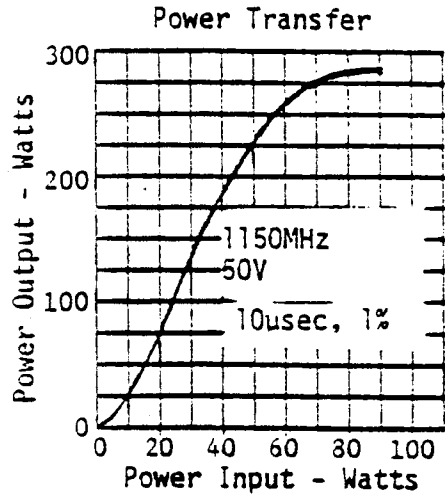
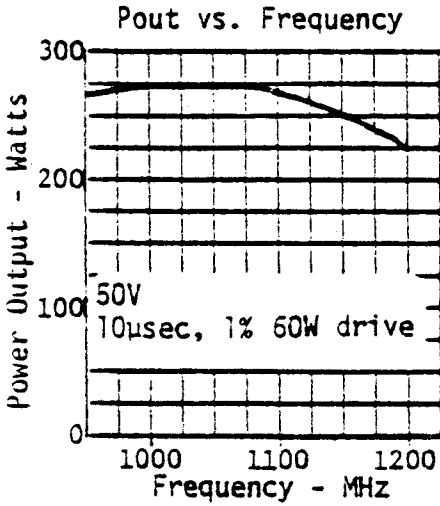
960 - 1215 MHz
75 W PULSE POWER
50 V
GOLD RELIABILITY



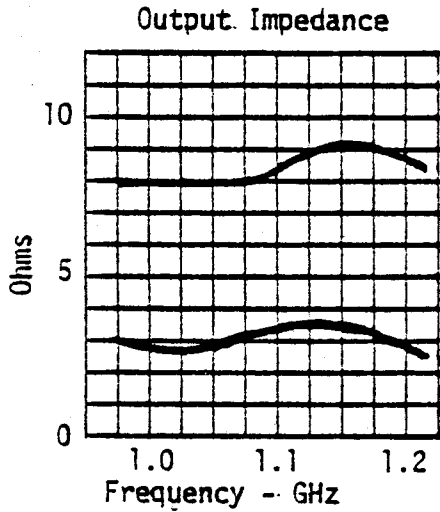
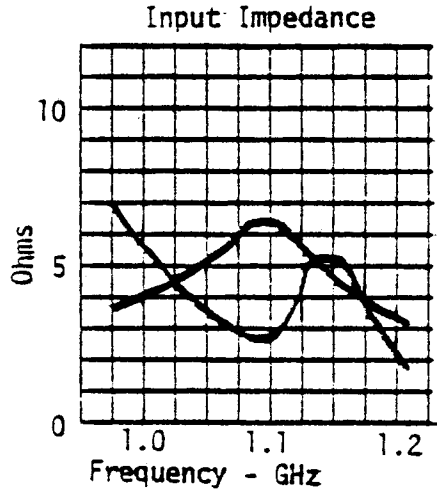
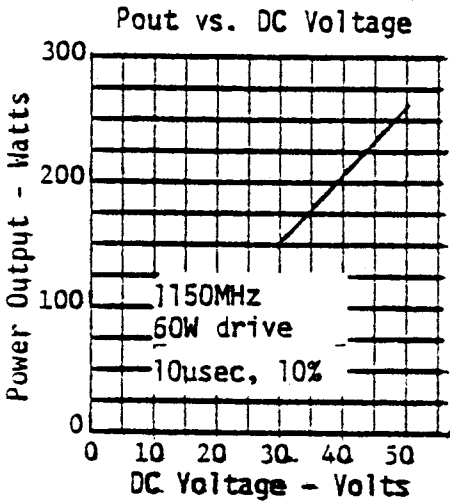
Electrical Characteristics ($T_{case} = 25\text{ }^{\circ}\text{C}$)

	SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC TEST	BV_{CES}	Collector - Emitter Breakdown Voltage	$I_C = 50\text{ mA}$	65			V
	BV_{EBO}	Emitter - Base Breakdown Voltage	$I_E = 10\text{ mA}$	3.5			V
	H_{FE}	D.C. Current Gain	$V_{CE} = 10\text{ V}$ $I_C = 1\text{ A}$	15		100	—
RF TEST	P_{out}	Output Power	$V_{CB} = 50\text{ V}$ RF Pulse : 10 μsec 1 % D.C. $P_{in} = 65\text{ W}$ F = 1 150 MHz	250			W
	I_C	Collector Current	$V_{CB} = 50\text{ V}$ RF Pulse : 10 μsec 1 % D.C. $P_{in} = 65\text{ W}$ F = 1 150 MHz			16,6	A
DESIGN RATINGS	P_T	Power Dissipation				117	W
	I_C	Continuous Collector Current				20	A
	θ_{JC}	Thermal Resistance			1.5		$^{\circ}\text{C/W}$
	T_{STG}	Storage Temperature		- 65		+ 200	$^{\circ}\text{C}$

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS

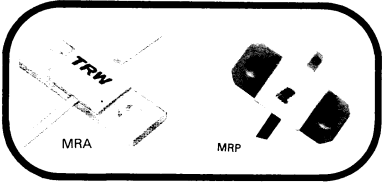


PRELIMINARY

The TRW MRP 1115 and 1214 series offers a complete family of broadband high power devices for pulsed application in the 1.2 - 1.4 GHz band.

Using internal compensation, the MRP 1115 and 1214 series is intended for use in phased array radar applications. All units are gold metalized for longevity and resistance to metal migrations. They are emitter balasted with diffused silicon resistors for reliability and ruggedness.

1.2 - 1.4 GHz
PULSE POWER UP TO 60 W
GOLD RELIABILITY



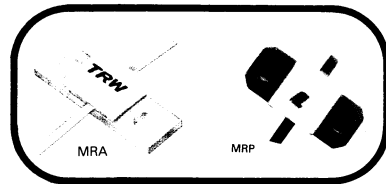
Electrical Characteristics (T_{case} = 25 °C)

SYMBOL	CHARACTERISTICS	MRP1115-1.5 E	MRP 1214-8	MRP 1214-30	MRP 1214-60
BV _{CES}	Collector - Base Breakdown Voltage	I _C = 20 mA 50 V min	I _C = 20 mA 60 V min	I _C = 60 mA 60 V min	I _C = 120 mA 60 V min
BV _{EBO}	Emitter - Base Breakdown Voltage	I _E = 0.5 mA 3.5 V min	I _E = 0.5 mA 3.5 V min	I _E = 1.5 mA 3.5 V min	I _E = 3.0 mA 3.5 V min
P _K	Peak Power Out 1.0 m sec PW, 15 % Duty Cycle V _{CB} = 28 V V _{CE} = 18 V, I _C = 230 mA	1.5 W 1.5 W	8.0 W	30.0 W	60.0 W
P _G	Typical Power Gain V _{CB} = 28 V V _{CE} = 18 V, I _C = 230 mA	9.0 dB 9.0 dB	7.0 dB	7.0 dB	7.0 dB
η _C	Typical Broadband Collector Efficiency	N/A	50 %	50 %	50 %
VSWR	Mismatch all Phase Angles	3 : 1	3 : 1	3 : 1	3 : 1
T _J	Max Junction Temperature	200 °C	200 °C	200 °C	200 °C

PRELIMINARY

The TRW MRP 1214 series offers a complete family of broadband high power devices for pulsed application in the 1.2 - 1.4 GHz band. Using internal compensation, the MRP 1214 series is intended for use in phased array radar applications. All units are gold metallized for longevity and resistance to metal migrations. They are emitter balasted with diffused silicon resistors for reliability and ruggedness.

1.2 - 1.4 GHz
 PULSE POWER UP TO 85 W
 GOLD RELIABILITY



Electrical Characteristics ($T_{case} = 25\text{ }^{\circ}\text{C}$)

SYMBOL	CHARACTERISTICS	MRP 1214-12A	MRP 1214-40A	MRP 1214-85A
BV_{CES}	Collector - Base Breakdown Voltage	$I_C = 20\text{ mA}$ 60 V min	$I_C = 60\text{ mA}$ 60 V min	$I_C = 120\text{ mA}$ 60 V min
BV_{EBO}	Emitter - Base Breakdown Voltage	$I_E = 0.5\text{ mA}$ 3.5 V min	$I_E = 1.5\text{ mA}$ 3.5 V min	$I_E = 3.0\text{ mA}$ 3.5 V min
P_K	Peak Power Out 100 μsec PW, 10 % Duty, Cycle $V_{CB} = 32\text{ V}$	12.0 W	40.0 W	85.0 W
P_G	Typical Power Gain $V_{CB} = 32\text{ V}$	6.5 dB	6.5 dB	6.5 dB
τ_C	Typical Broadband Collector Efficiency	50 %	50 %	50 %
VSWR	Mismatch all Phase Angle	2 : 1	2 : 1	2 : 1
T_J	Max Junction Temperature	200 $^{\circ}\text{C}$	200 $^{\circ}\text{C}$	200 $^{\circ}\text{C}$