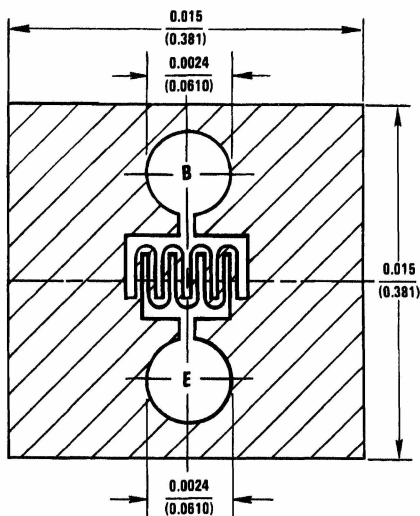




TL/G/10037-32

DESCRIPTION

Process 42 is an overlay, double-diffused, silicon epitaxial device.

APPLICATION

This device was designed for use in low noise UHF/VHF amplifiers with collector current in the 100 μ A to 10 mA range in common emitter or common base mode of operation, and in low frequency drift, high output UHF oscillators.

PRINCIPAL DEVICE TYPES

TO-92 BEC: MPSH10

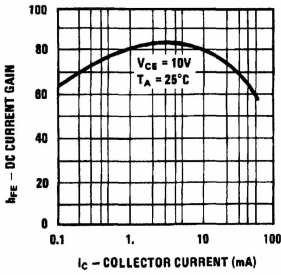
TO-236: MMBTH10

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

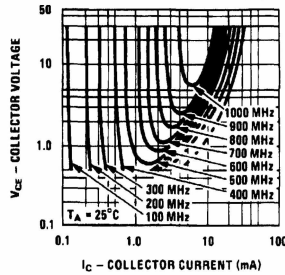
Symbol	Conditions	Min	Typ	Max	Units
P_G	$f = 450 \text{ MHz}$, $V_{CE} = 10\text{V}$, $I_C = 2 \text{ mA}$ (Figure 1)	10	13		dB
NF	$f = 450 \text{ MHz}$, $V_{CE} = 10\text{V}$, $I_C = 2 \text{ mA}$, $R_G = 50\Omega$ (Figure 1)		3.0	5.0	dB
P_{OUT}	$f = 500 \text{ MHz}$, $V_{CB} = 15\text{V}$, $I_E = 8 \text{ mA}$ (TO-92) (Figure 3)	30	50		mW
P_G	$f = 200 \text{ MHz}$, $V_{CE} = 10\text{V}$, $I_C = 2 \text{ mA}$ (Figure 2)	22	27		dB
NF	$f = 200 \text{ MHz}$, $V_{CE} = 10\text{V}$, $I_C = 2 \text{ mA}$, $R_S = 120\Omega$ (Figure 2)		2.0	3.5	dB
h_{fe}	$f = 100 \text{ MHz}$, $V_{CE} = 10\text{V}$, $I_C = 5 \text{ mA}$	6	10		
rb'/Cc	$f = 79.8 \text{ MHz}$, $V_{CE} = 10\text{V}$, $I_C = 5 \text{ mA}$			10	ps
C_{CB}	$f = 1.0 \text{ MHz}$, $V_{CE} = 10\text{V}$, $I_E = 0$ (TO-72)		0.4	0.5	pF
C_{CE}	$f = 1.0 \text{ MHz}$, $V_{CE} = 10\text{V}$, $I_B = 0$ (TO-72)		0.2	0.3	pF
C_{EB}	$f = 1.0 \text{ MHz}$, $V_{EB} = 0.5\text{V}$, $I_C = 0$ (TO-72)		0.8	1.5	pF
h_{FE}	$V_{CE} = 10\text{V}$, $I_C = 5 \text{ mA}$ $V_{CE} = 6\text{V}$, $I_C = 1 \text{ mA}$	40 30	90	200	
$V_{CE(SAT)}$	$I_C = 10 \text{ mA}$, $I_B = 5 \text{ mA}$			0.2	V
BV_{CEO}	$I_C = 1 \text{ mA}$	30			V
BV_{CBO}	$I_C = 10 \mu\text{A}$	35			V
BV_{EBO}	$I_E = 10 \mu\text{A}$	4			V
I_{CBO}	$V_{CB} = 30\text{V}$			100	nA
I_{EBO}	$V_{EB} = 3\text{V}$			100	nA

Process 42

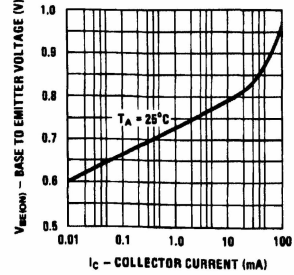
DC Current Gain vs Collector Current



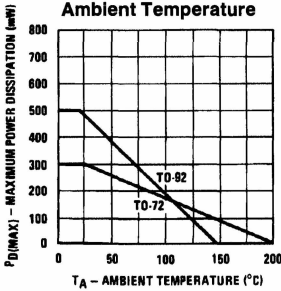
Contours of Constant Gain Bandwidth Product (f_T)



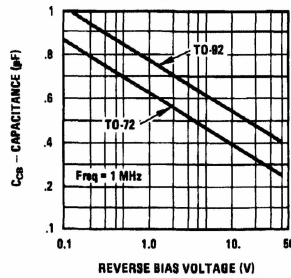
Base-Emitter ON Voltage vs Collector Current



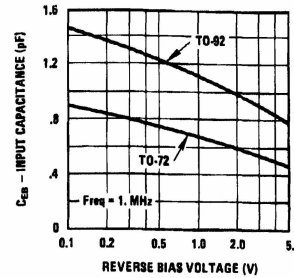
Maximum Power Dissipation vs Ambient Temperature



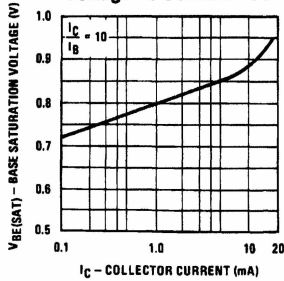
Reverse Transfer Capacitance vs Reverse Bias Voltage



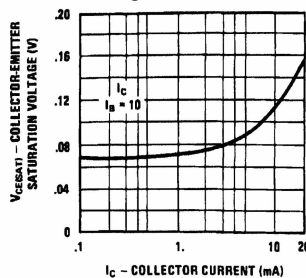
Input Capacitance vs Reverse Bias Voltage



Base-Emitter Saturation Voltage vs Collector Current

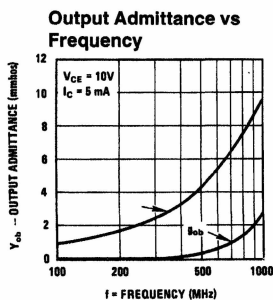
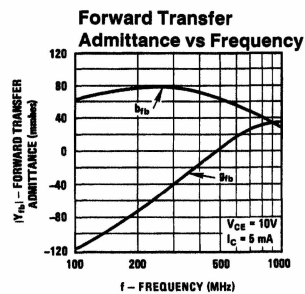
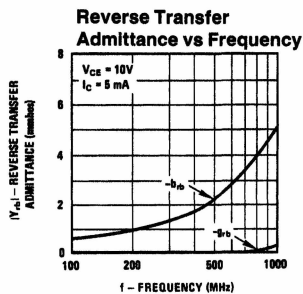
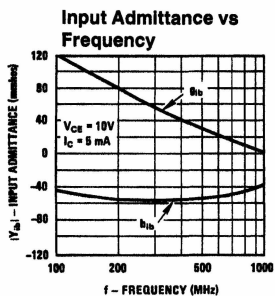


Collector-Emitter Saturation Voltage vs Collector Current



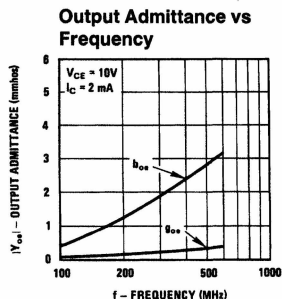
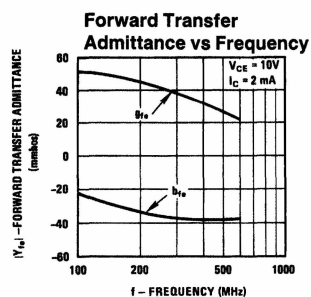
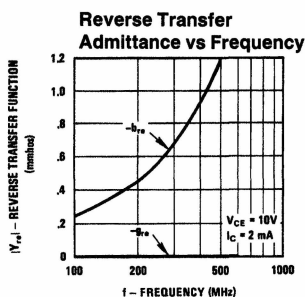
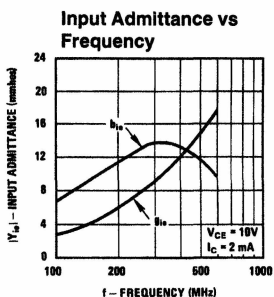
TL/G/10037-33

COMMON BASE Y PARAMETERS VS FREQUENCY



TL/G/10037-34

COMMON EMITTER Y PARAMETERS VS FREQUENCY



TL/G/10037-35

Process 42

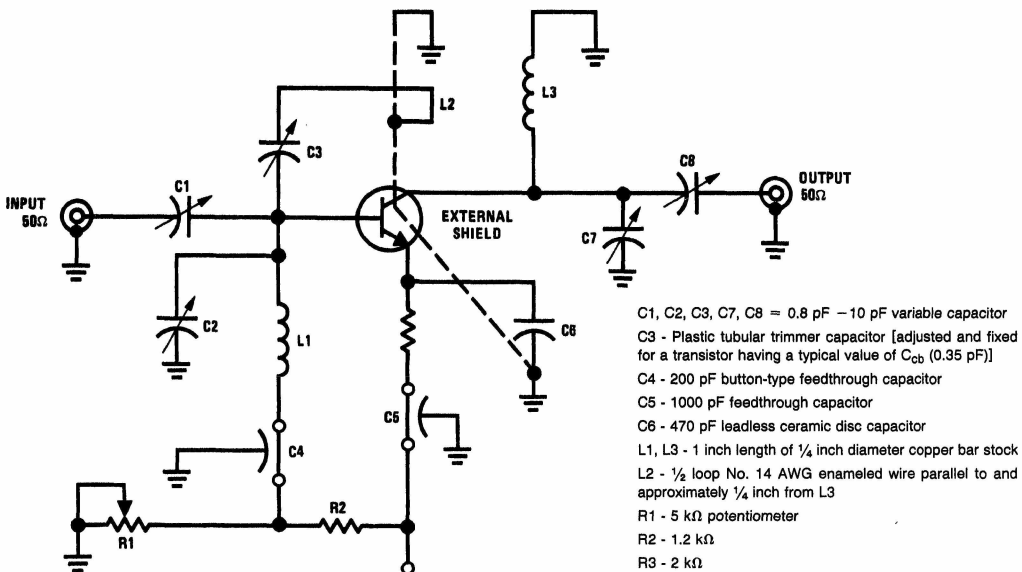
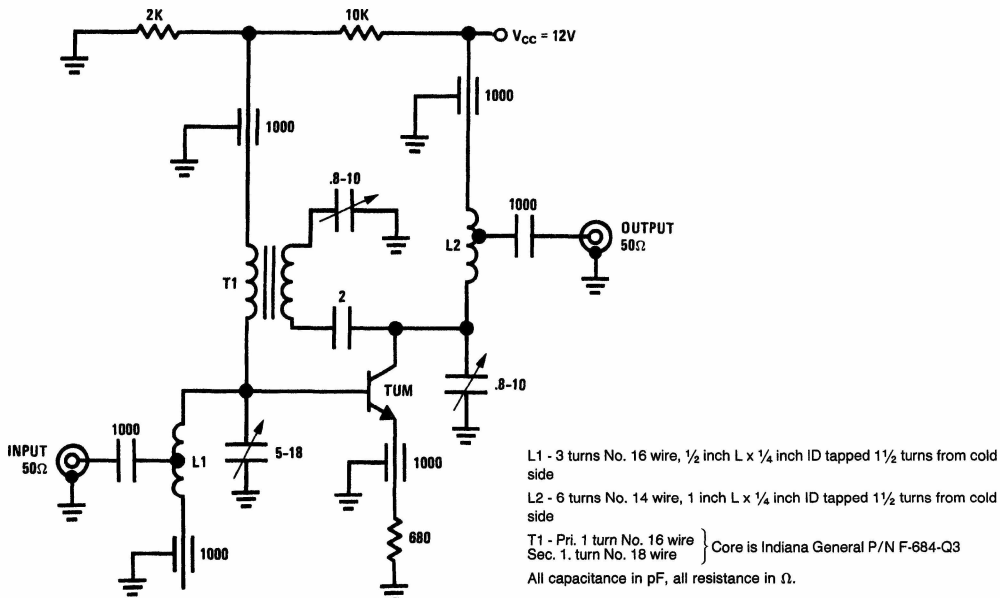
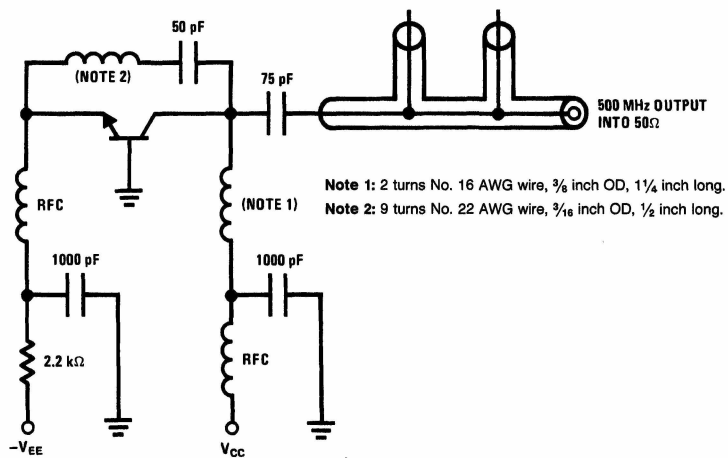


FIGURE 1. Neutralized 450 MHz Gain and Noise Figure Circuit

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FIGURE 3. 500 MHz Oscillator Circuit