

**COMMON COLLECTOR MICROWAVE
OSCILLATOR TRANSISTOR**

FEATURES

- Gold metallizations
- Emitter ballast resistors
- Auto-aligned and glass passivated structure
- Hermetical ceramic package

APPLICATIONS

Oscillator transistor for telecommunications
in frequency band 0,7 to 1,2 GHz

$$f = 1,2 \text{ GHz}$$

$$P_{OUT} \geq 1,3 \text{ W}$$

$$\eta_c \geq 40\%$$

$$V_{EE} = -24 \text{ V}$$



Case : CB-294 (.250 2L FL)
CB-311 (.250 2L)

ABSOLUTE RATINGS (LIMITING VALUES)	Symbols	Values	Units
Emitter-base (d.c.) voltage	V_{EBO}	3	V
Collector-base (d.c.) voltage	V_{CBO}	45	V
Collector-emitter (d.c.) voltage	V_{CEO}	20	V
Collector (d.c.) current	I_C	0,3	A
Total power dissipation	P_{tot}	7	W
Storage and junction temperature range	T_{stg}	- 65 → + 200	°C
	T_j	- 55 → + 200	°C

Thermal resistance (junction-case)	$R_{th(j-c)}$	25	°C/W
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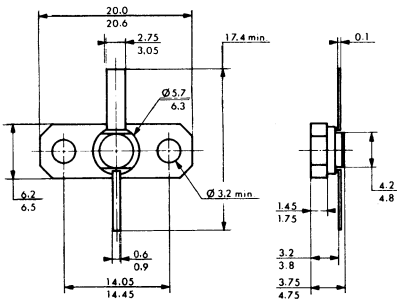
STATIC CHARACTERISTICS at $T_{amb} = 25^{\circ}\text{C}$

Symbols	Values			Units	Test conditions	
	min.	typ.	max.			
$V_{(BR)EBO}$	3			V	$I_E = 1\text{ mA}$	$I_C = 0$
$V_{(BR)CBO}$	45			V	$I_C = 10\text{ mA}$	$I_B = 0$
$V_{(BR)CEO}$	24			V	$I_C = 10\text{ mA}$	$I_B = 0$
H_{21E}	15		120		$I_C = 0,1\text{ A}$	$V_{CE} = 5\text{ V}$
C_{cb}			3	pF	$V_{CB} = 28\text{ V}$	$f = 1\text{ MHz}$

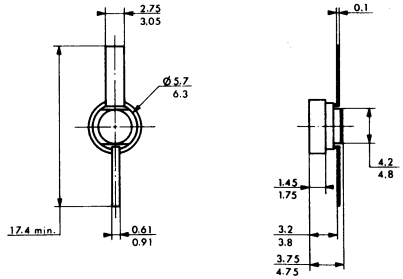
DYNAMIC CHARACTERISTICS at $T_{amb} = 25^{\circ}\text{C}$

Symbols	Values			Units	Test conditions		
	min.	typ.	max.				
$P_{OUT(OSC)}$	1,3			W	$f = 1,2\text{ GHz}$	$V_{EE} = -24\text{ V}$	$I_E = 130\text{ mA}$
η_c	40			%			

CASE DESCRIPTION



CB-294
(.250 2L FL)



CB-311
(.250 2L)

Dimensions in millimeters

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Oscillator transistor for telecommunications in frequency band 0,7 to 1,2 GHz

$$f = 1,2 \text{ GHz}$$

$$P_{OUT} \geq 4 \text{ W}$$

$$\eta_c \geq 40\%$$

$$V_{EE} = -24 \text{ V}$$



Case : CB-294 (.250 2L FL)
CB-311 (.250 2L)

ABSOLUTE RATINGS (LIMITING VALUES)

	Symbols	Values	Units
Emitter-base (d.c.) voltage	VEBO	3	V
Collector-base (d.c.) voltage	VCBO	45	V
Collector-emitter (d.c.) voltage	VCEO	20	V
Collector (d.c.) current	IC	0,8	A
Total power dissipation	Ptot	10	W
Storage and junction temperature range	T _{stg}	- 65 → + 200	°C
	T _j	- 55 → + 200	°C

Thermal resistance (junction-case)

R_{th} (j-c)

17,5

°C/W

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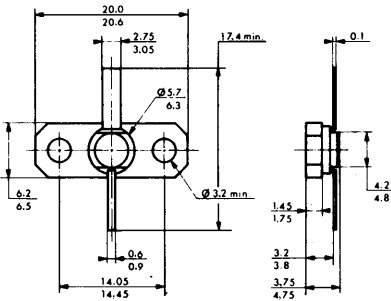
STATIC CHARACTERISTICS at $T_{amb} = 25^{\circ}\text{C}$

Symbols	Values			Units	Test conditions	
	min.	typ.	max.			
$V_{(BR)EBO}$	3			V	$I_E = 10\text{ mA}$	$I_C = 0$
$V_{(BR)CBO}$	45			V	$I_C = 10\text{ mA}$	$I_B = 0$
$V_{(BR)CEO}$	24			V	$I_C = 10\text{ mA}$	$I_B = 0$
H21E	15		120		$I_C = 0,5\text{ A}$	$V_{CE} = 5\text{ V}$
C_{cb}			7	pF	$V_{CB} = 28\text{ V}$	$f = 1\text{ MHz}$

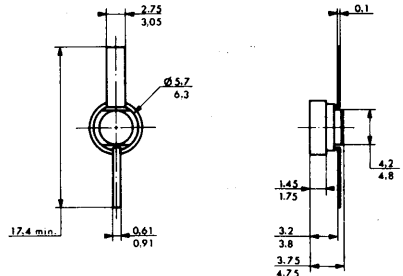
DYNAMIC CHARACTERISTICS at $T_{amb} = 25^{\circ}\text{C}$

Symbols	Values			Units	Test conditions		
	min.	typ.	max.				
$P_{OUT (OSC)}$	4			W	$f = 1,2\text{ GHz}$	$V_{EE} = -24\text{ V}$	$I_E = 0,4\text{ A}$
η_c	40			%			

CASE DESCRIPTION



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(.250 2L FL)



CB-311
(.250 2L)

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Oscillator transistor for telecommunications
in frequency band 1,35 to 2,7 GHz

f	=	1,5	2,5	GHz
$POUT$	=	0,75	0,55	W
η_c	=	35	25	%
VEE	=	- 24		V



Case : CB-294 (.250 2L FL)
CB-311 (.250 2L)

ABSOLUTE RATINGS (LIMITING VALUES)

	Symbols	Values	Units
Emitter-base (d.c.) voltage	VEBO	3,5	V
Collector-base (d.c.) voltage	VCBO	50	V
Collector-emitter (d.c.) voltage	VCES	50	V
Collector (d.c.) current	I_C	0,15	A
Total power dissipation	P_{tot}	3,8	W
Storage and junction temperature range	T_{stg}	- 65 \rightarrow + 200	$^{\circ}C$
	T_j	- 55 \rightarrow + 200	$^{\circ}C$

Thermal resistance (junction-case)

 $R_{th(j-c)}$

45

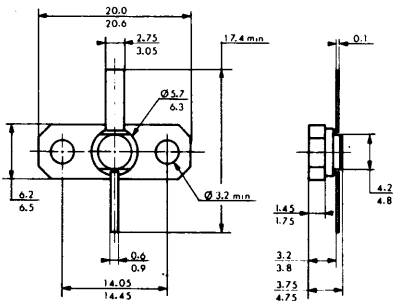
 $^{\circ}C/W$

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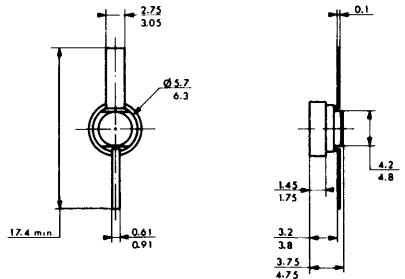
STATIC CHARACTERISTICS at $T_{amb} = 25^{\circ}\text{C}$

Symbols	Values			Units	Test conditions
	min.	typ.	max.		
$V_{(BR)EBO}$	3,5			V	$I_B = 5\text{ mA}$
$V_{(BR)CBO}$	50			V	$I_C = 5\text{ mA}$ $I_B = 0$
$V_{(BR)CES}$	50			V	$I_C = 5\text{ mA}$ $R_{BE} = 10\ \Omega$
$V_{(BR)CEO}$	24			V	$I_C = 5\text{ mA}$ $I_B = 0$
I_{CBO}			0,5	mA	$V_{CB} = 28\text{ V}$ $I_E = 0$
HFE	10		120		$I_C = 50\text{ mA}$ $V_{CE} = 5\text{ V}$
C_{cb}			2,5	pF	$V_{CB} = 28\text{ V}$ $f = 1\text{ MHz}$

CASE DESCRIPTION

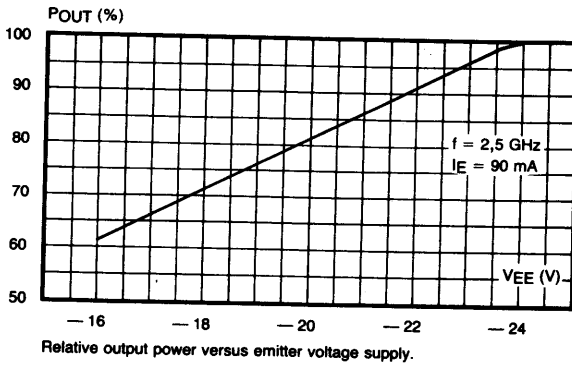
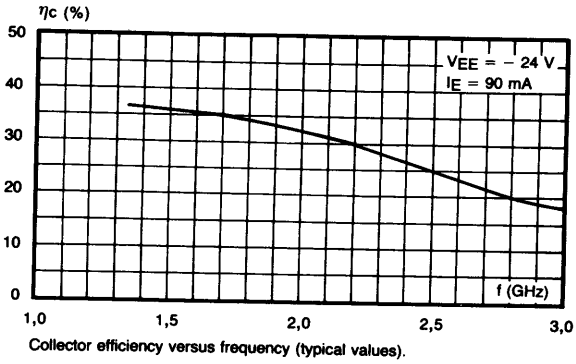
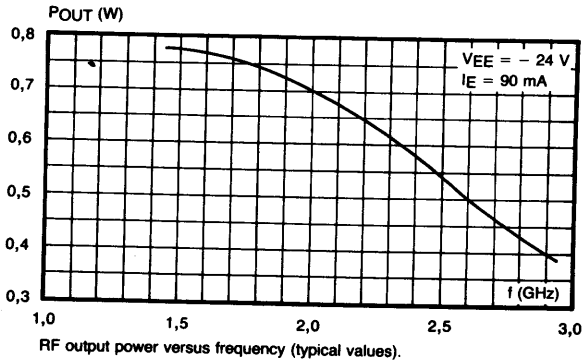


CB-294
(.250 2L FL)

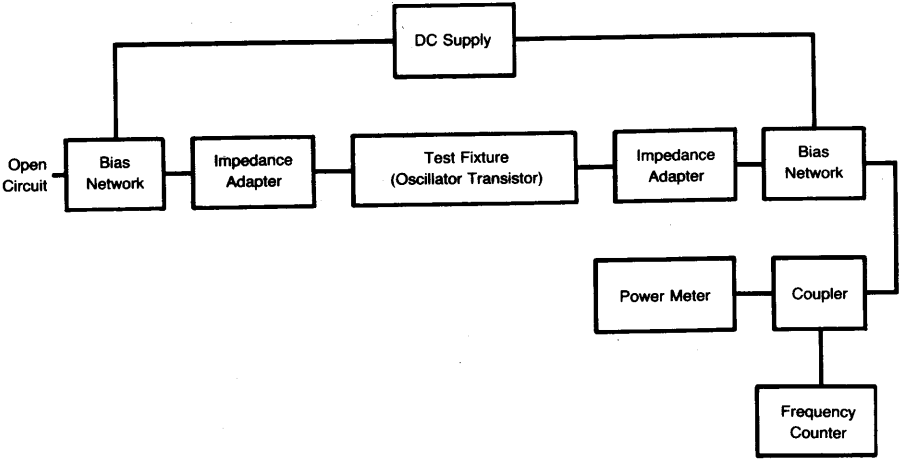


CB-311
(.250 2L)

Dimensions in millimeters



SCHMATIC TEST CIRCUIT DIAGRAM



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f =	1,5	2,5	GHz
POUT =	1,4	1,0	W
η_c =	48	35	%
VEE =	- 24		V



Case : CB-294 (.250 2L FL)
CB-311 (.250 2L)

ABSOLUTE RATINGS (LIMITING VALUES)	Symbols	Values	Units
Emitter-base (d.c.) voltage	VEBO	3,5	V
Collector-base (d.c.) voltage	VCBO	50	V
Collector-emitter (d.c.) voltage	VCES	50	V
Collector (d.c.) current	IC	0,4	A
Total power dissipation	Ptot	5,8	W
Storage and junction temperature range	T _{stg}	- 65 → + 200	°C
	T _j	- 55 → + 200	°C

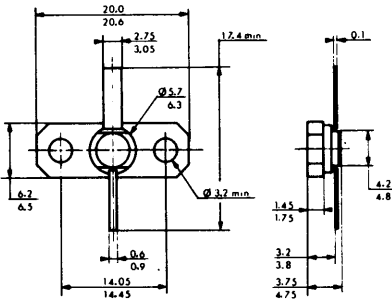
Thermal resistance (junction-case)	R _{th (j-c)}	30	°C/W
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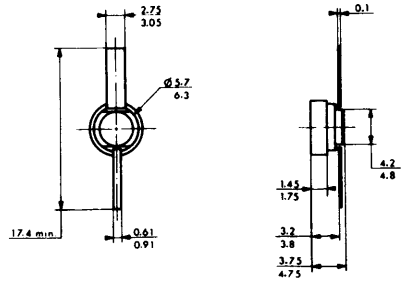
STATIC CHARACTERISTICS at $T_{amb} = 25^{\circ}\text{C}$

Symbols	Values			Units	Test conditions
	min.	typ.	max.		
$V_{(BR)EBO}$	3,5			V	$I_E = 10\text{ mA}$
$V_{(BR)CBO}$	50			V	$I_C = 10\text{ mA}$ $I_B = 0$
$V_{(BR)CES}$	50			V	$I_C = 10\text{ mA}$ $V_{BE} = 0$
$V_{(BR)CEO}$	24			V	$I_C = 10\text{ mA}$ $I_B = 0$
HFE	10		120		$I_C = 100\text{ mA}$ $V_{CE} = 5\text{ V}$
C_{cb}			3,5	pF	$V_{CB} = 28\text{ V}$ $f = 1\text{ MHz}$

CASE DESCRIPTION

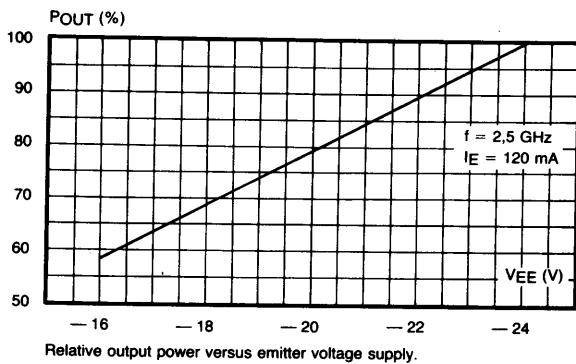
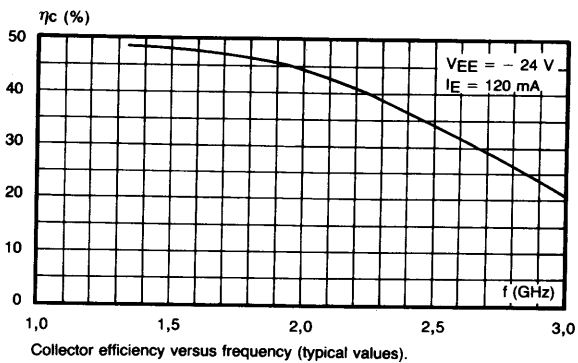
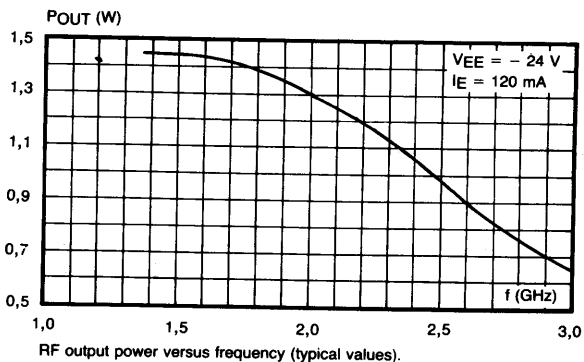


CB-294
(.250 2L FL)

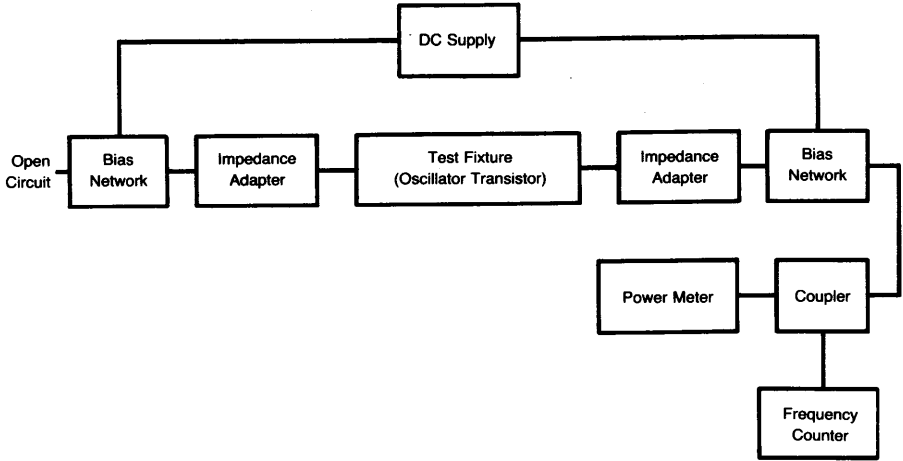


CB-311
(.250 2L)

Dimensions in millimeters



SCHMATIC TEST CIRCUIT DIAGRAM



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f	=	1,5	2,5	GHz
POUT	=	2,5	1,75	W
η_c	=	40	30	%
VEE	=	- 24		V



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ABSOLUTE RATINGS (LIMITING VALUES)

	Symbols	Values	Units
Emitter-base (d.c.) voltage	VEBO	3,5	V
Collector-base (d.c.) voltage	VCBO	50	V
Collector-emitter (d.c.) voltage	VCES	50	V
Collector (d.c.) current	IC	0,8	A
Total power dissipation	Ptot	10	W
Storage and junction temperature range	T _{stg}	- 65 → + 200	°C
	T _j	- 55 → + 200	°C

Thermal resistance (junction-case)

R_{th (j-c)}

17

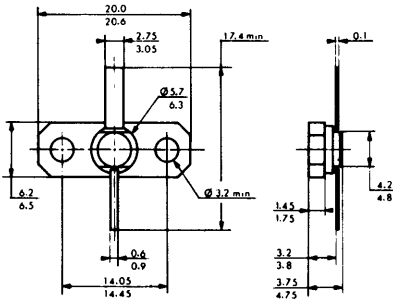
°C/W

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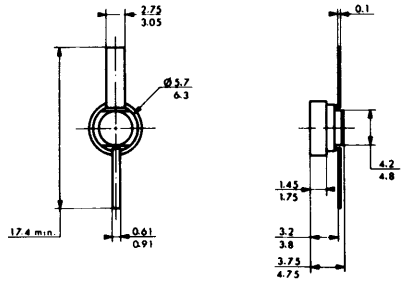
STATIC CHARACTERISTICS at $T_{amb} = 25^{\circ}\text{C}$

Symbols	Values			Units	Test conditions
	min.	~ typ.	max.		
$V_{(BR)EBO}$	3,5			V	$I_B = 10\text{ mA}$
$V_{(BR)CBO}$	50			V	$I_C = 10\text{ mA}$ $I_B = 0$
$V_{(BR)CER}$	50			V	$I_C = 10\text{ mA}$ $R_{BE} = 10\ \Omega$
$V_{(BR)CEO}$	24			V	$I_C = 10\text{ mA}$ $I_B = 0$
I_{CBO}			2,5	mA	$V_{CB} = 28\text{ V}$ $I_E = 0$
HFE	10		120		$I_C = 250\text{ mA}$ $V_{CE} = 5\text{ V}$
C_{cb}			5	pF	$V_{CB} = 28\text{ V}$ $f = 1\text{ MHz}$

CASE DESCRIPTION

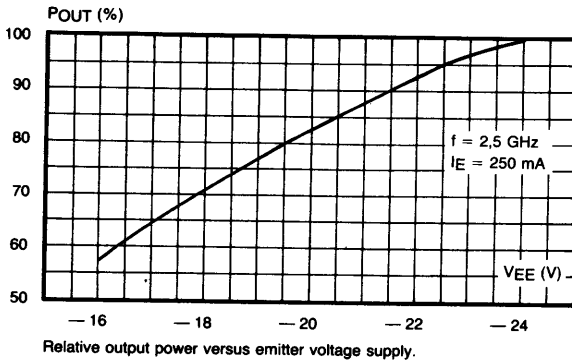
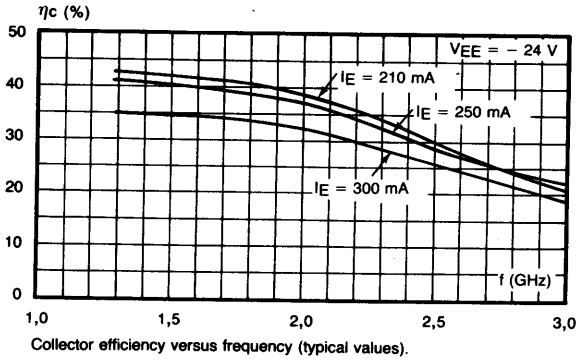
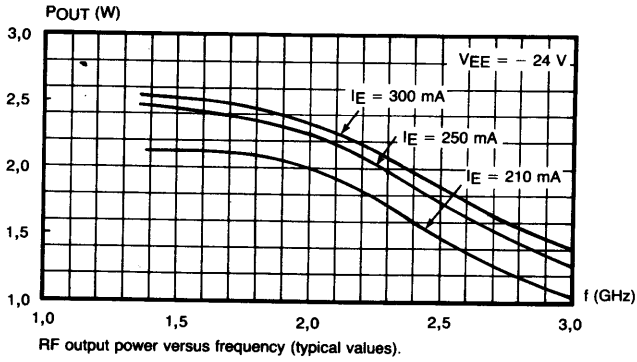


CB-294
(.250 2L FL)

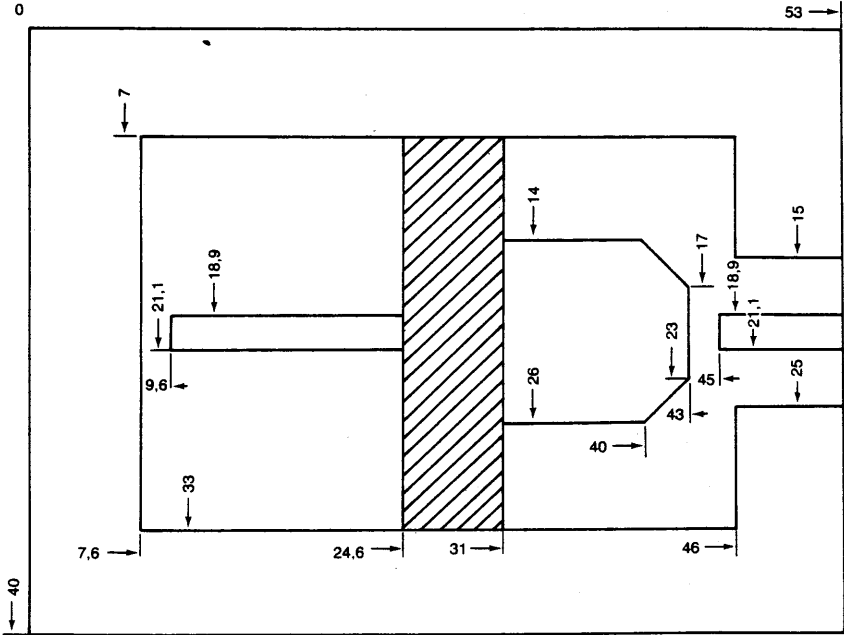


CB-311
(.250 2L)

Dimensions in millimeters



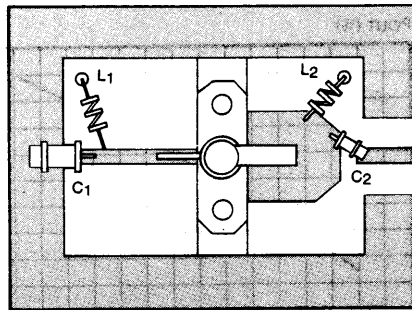
OSCILLATOR CIRCUIT



Substrate : glass teflon $\epsilon = 2,6$ and thickness = 0,8 mm

Scale : 2

 Copper



$L_1 = L_2 = 3$ turns copper wire $d = 0,5$ mm, $\varnothing = 5$ mm
 $C_1 = 0,6 - 4,5$ pF (AT 7271-0 JOHANSON)
 $C_2 = 0,3 - 1,2$ pF (AT 7261-0 JOHANSON)

SCHEMATIC TEST CIRCUIT DIAGRAM

