



2N 1613

2N 1711

PNP SILICON PLANAR EPITAXIAL TRANSISTORS

THE 2N1613 AND 2N1711 ARE PNP SILICON PLANAR EPITAXIAL TRANSISTORS DESIGNED FOR SWITCHING AND D.C. AMPLIFIERS.

CASE TO-39



C E B

ABSOLUTE MAXIMUM RATINGS

Collector-Base Voltage	VCBO	75V
Collector-Emitter Voltage ($R_{BE} \leq 10\Omega$)	VCER	50V
Emitter-Base Voltage	VEBO	7V
Total Power Dissipation ($T_A=25^\circ C$)	P _{tot}	0.8W
($T_C=25^\circ C$)		3W
($T_C=100^\circ C$)		1.7W
Operating Junction Temperature	T _j	200°C
Storage Temperature Range	T _{stg}	-65 to 300°C

ELECTRICAL CHARACTERISTICS ($T_A=25^\circ C$ unless otherwise noted)

PARAMETER	SYMBOL	2N1613		2N1711		UNIT	TEST CONDITIONS
		MIN	MAX	MIN	MAX		
Collector-Base Breakdown Voltage	BVCBO	75		75		V	I _C =0.1mA I _E =0
Collector-Emitter Breakdown Voltage	LV _{CER} *	50		50		V	I _C =100mA R _{BE} <10Ω
Emitter-Base Breakdown Voltage	BVEBO	7		7		V	I _E =0.1mA I _C =0
Collector Cutoff Current	ICBO	10		10		nA	V _{CB} =60V I _E =0 V _{CB} =60V I _E =0 T _A =150°C
		10		10		μA	
Emitter Cutoff Current	IEBO	10		5		nA	VEB=5V I _C =0
Base-Emitter Saturation Voltage	VBE(sat)*	1.3		1.3		V	I _C =150mA I _B =15mA
Collector-Emitter Saturation Voltage	VCE(sat)*	1.5		1.5		V	I _C =150mA I _B =15mA
D.C. Current Gain	H _{FE} *	20		35			I _C =0.1mA VCE=10V
		35		75			I _C =10mA VCE=10V
		40	120	100	300		I _C =150mA VCE=10V
		20		40			I _C =500mA VCE=10V
		20		35			I _C =10mA VCE=10V
Current Gain-Bandwidth Product	f _T	60		70		MHz	T _A =-55°C I _C =50mA VCE=10V f=20MHz

* Pulse Test : Pulse Width=0.3mS, Duty Cycle=1%

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PARAMETER	SYMBOL	2N1613		2N1711		UNIT	TEST CONDITIONS
		MIN	MAX	MIN	MAX		
Output Capacitance	C _{ob}		35		25	pF	V _{CB} =10V I _E =0
Input Capacitance	C _{ib}		80		80	pF	V _{EB} =0.5V I _C =0
Noise Figure	NF		12		8	dB	I _C =0.3mA V _{CE} =10V R _G =510Ω f=1kHz BW=1Hz
<u>Small Signal h-Parameters</u>							
Input Resistance	h _{ib}	24	34	20	34	Ω	I _C =1mA V _{CB} =5V f=1kHz
		4	8	4	8	Ω	I _C =5mA V _{CB} =10V f=1kHz
Voltage Feedback Ratio	h _{rb}		3		5	x10 ⁻⁴	I _C =1mA V _{CB} =5V f=1kHz
			3		5	x10 ⁻⁴	I _C =5mA V _{CB} =10V f=1kHz
Small Signal Current Gain	h _{fe}	30	100	50	200		I _C =1mA V _{CE} =5V f=1kHz
		35	150	70	300		I _C =5mA V _{CE} =10V f=1kHz
Output Conductance	h _{ob}	0.1	1	0.05	0.5	μS	I _C =1mA V _{CB} =5V f=1kHz
		0.1	1	0.05	0.5	μS	I _C =5mA V _{CB} =10V f=1kHz

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