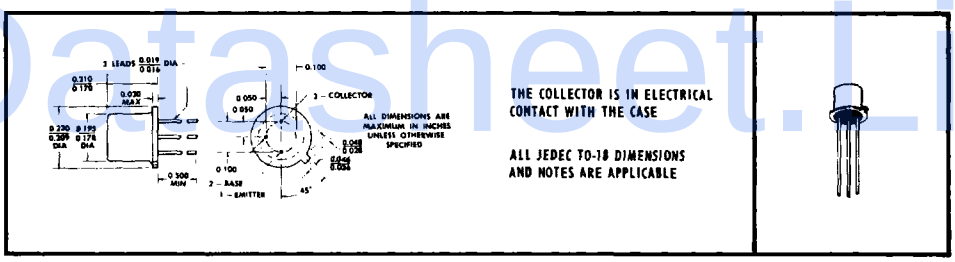
TYPES 2N2483, 2N2484
N-P-N SILICON TRANSISTORS

BULLETIN NO. DL-S 6710300, SEPTEMBER 1967

FOR LOW-LEVEL, LOW-NOISE, HIGH-GAIN, AMPLIFIER APPLICATIONS

- **Guaranteed Low-Noise Characteristics at 100 Hz, 1 kHz, and 10 kHz**
- **High $V_{(BR)CEO}$ . . . 60 V Min**
- **D-C Beta Guaranteed at $I_C = 1\ \mu A$ (2N2484)**

***mechanical data**



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***absolute maximum ratings at 25°C free-air temperature (unless otherwise noted)**

Collector-Base Voltage	60 V
Collector-Emitter Voltage (See Note 1)	60 V
Emitter-Base Voltage	6 V
Continuous Collector Current	50 mA
Continuous Device Dissipation at (or below) 25°C Free-Air Temperature (See Note 2)	0.36 W
Continuous Device Dissipation at (or below) 25°C Case Temperature (See Note 3)	1.2 W
Continuous Device Dissipation at 100°C Case Temperature	0.68 W
Storage Temperature Range	−65°C to 200°C
Lead Temperature 1/16 Inch from Case for 10 Seconds	300°C

NOTES: 1. This value applies when the base-emitter diode is open-circuited.
2. Derate linearly to 200°C free-air temperature at the rate of 2.06 mW/deg.
3. Derate linearly to 200°C case temperature at the rate of 6.85 mW/deg.

*Indicates JEDEC registered data

USES CHIP N11

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TYPES 2N2483, 2N2484
N-P-N SILICON TRANSISTORS

***electrical characteristics at 25°C free-air temperature (unless otherwise noted)**

PARAMETER		TEST CONDITIONS	2N2483		2N2484		UNIT
			MIN	MAX	MIN	MAX	
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10\ \mu A$, $I_E = 0$	60		60		V
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 10$ mA, $I_B = 0$, See Note 4	60		60		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10\ \mu A$, $I_C = 0$	6		6		V
I_{CBO}	Collector Cutoff Current	$V_{CB} = 45$ V, $I_E = 0$		10		10	nA
		$V_{CB} = 45$ V, $I_E = 0$, $T_A = 150°C$		10		10	μA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = 5$ V, $I_C = 0$		10		10	nA
h_{FE}	Static Forward Current Transfer Ratio	$V_{CE} = 5$ V, $I_C = 1\ \mu A$			30		
		$V_{CE} = 5$ V, $I_C = 10\ \mu A$	40	120	100	500	
		$V_{CE} = 5$ V, $I_C = 10\ \mu A$, $T_A = -55°C$	10		20		
		$V_{CE} = 5$ V, $I_C = 100\ \mu A$	75		175		
		$V_{CE} = 5$ V, $I_C = 500\ \mu A$	100		200		
		$V_{CE} = 5$ V, $I_C = 1$ mA	175		250		
		$V_{CE} = 5$ V, $I_C = 10$ mA, See Note 4		500		800	
V_{BE}	Base-Emitter Voltage	$V_{CE} = 5$ V, $I_C = 100\ \mu A$	0.5	0.7	0.5	0.7	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_B = 100\ \mu A$, $I_C = 1$ mA		0.35		0.35	V
h_{ie}	Small-Signal Common-Emitter Input Impedance	$V_{CE} = 5$ V, $I_C = 1$ mA, f = 1 kHz	1.5	13	3.5	24	kΩ
h_{fe}	Small-Signal Common-Emitter Forward Current Transfer Ratio		80	450	150	900	
h_{re}	Small-Signal Common-Emitter Reverse Voltage Transfer Ratio			8×10^{-4}		8×10^{-4}	
h_{oe}	Small-Signal Common-Emitter Output Admittance			30		40	μmho
$\lvert h_{fe} \rvert$	Small-Signal Common-Emitter Forward Current Transfer Ratio	$V_{CE} = 5$ V, $I_C = 50\ \mu A$, f = 5 MHz	2.4		3		
		$V_{CE} = 5$ V, $I_C = 500\ \mu A$, f = 30 MHz	2		2		
C_{obo}	Common-Base Open-Circuit Output Capacitance	$V_{CB} = 5$ V, $I_E = 0$, f = 140 kHz		6		6	pF
C_{ibo}	Common-Base Open-Circuit Input Capacitance	$V_{EB} = 0.5$ V, $I_C = 0$, f = 140 kHz		6		6	pF

***operating characteristics at 25°C free-air temperature**

PARAMETER		TEST CONDITIONS	2N2483	2N2484	UNIT
			MAX	MAX	
$\overline{NF}$	Average Noise Figure	$V_{CE} = 5$ V, $I_C = 10\ \mu A$, $R_G = 10$ kΩ, Noise Bandwidth = 15.7 kHz, See Note 5	4	3	dB
NF	Spot Noise Figure	$V_{CE} = 5$ V, $I_C = 10\ \mu A$, $R_G = 10$ kΩ, f = 100 Hz, Noise Bandwidth = 20 Hz	15	10	dB
		$V_{CE} = 5$ V, $I_C = 10\ \mu A$, $R_G = 10$ kΩ, f = 1 kHz, Noise Bandwidth = 200 Hz	4	3	dB
		$V_{CE} = 5$ V, $I_C = 10\ \mu A$, $R_G = 10$ kΩ, f = 10 kHz, Noise Bandwidth = 2 kHz	3	2	dB

NOTES: 4. These parameters must be measured using pulse techniques. $t_p = 300\ \mu s$, duty cycle $\leq 1\%$.

5. Average Noise Figure is measured in an amplifier with response down 3 dB at 10 Hz and 10 kHz and a high-frequency rolloff of 6 dB/octave.

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