



# 2N930

# 2N3548

COMPLEMENTARY SILICON AF LOW NOISE SMALL SIGNAL TRANSISTORS

THE 2N930 (NPN) AND 2N3548 (PNP) ARE SILICON PLANAR EPITAXIAL TRANSISTORS FOR USE IN AF SMALL SIGNAL AMPLIFIERS AND DIRECT COUPLED CIRCUITS.

CASE TO-18



CBE

**ABSOLUTE MAXIMUM RATINGS** For p-n-p devices, voltage and current values are negative.

		2N930(NPN)	2N3548(PNP)
Collector-Base Voltage	V <sub>CB0</sub>	45V	60V
Collector-Emitter Voltage	V <sub>CE0</sub>	45V	45V
Emitter-Base Voltage	V <sub>EB0</sub>	5V	6V
Collector Current	I <sub>C</sub>	100mA **	100mA
Total Power Dissipation (T <sub>A</sub> ≤ 25°C)	P <sub>tot</sub>	300mW	400mW
Junction Temperature	T <sub>j</sub>	175°C	200°C
Storage Temperature Range	T <sub>stg</sub>	-65 to 200°C	

\*\* 30mA in JEDEC registration.

**ELECTRICAL CHARACTERISTICS** (T<sub>A</sub>=25°C unless otherwise noted)

PARAMETER	SYMBOL	2N930		2N3548		UNIT	TEST CONDITIONS
		MIN	MAX	MIN	MAX		
Collector-Emitter Breakdown Voltage	V <sub>CE0</sub>	45		45		V	I <sub>C</sub> =10mA (Pulsed) I <sub>B</sub> =0
Collector Cutoff Current	I <sub>CES</sub>		10		10	nA	V <sub>CE</sub> =45V V <sub>BE</sub> =0
			10		10	μA	V <sub>CE</sub> =45V V <sub>BE</sub> =0 T <sub>A</sub> =170°C
Emitter Cutoff Current	I <sub>EB0</sub>		10		10	nA	V <sub>EB</sub> =5V I <sub>C</sub> =0
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>		1		1	V	I <sub>C</sub> =10mA I <sub>B</sub> =0.5mA
Base-Emitter Breakdown Voltage	V <sub>BE(sat)</sub>	0.6	1	0.6	1	V	I <sub>C</sub> =10mA I <sub>B</sub> =0.5mA
D.C. Current Gain	H <sub>FE</sub>	100	300	100	300		I <sub>C</sub> =10μA V <sub>CE</sub> =5V
					150		I <sub>C</sub> =100μA V <sub>CE</sub> =5V
			150				I <sub>C</sub> =500μA V <sub>CE</sub> =5V
			600		600		I <sub>C</sub> =10mA V <sub>CE</sub> =5V
Current Gain-Bandwidth Product	f <sub>T</sub>		20		20		I <sub>C</sub> =10μA V <sub>CE</sub> =5V T <sub>A</sub> =-55°C
			30		60	150	I <sub>C</sub> =0.5mA V <sub>CE</sub> =5V I <sub>C</sub> =1mA V <sub>CE</sub> =5V
Collector-Base Capacitance	C <sub>ob</sub>		8		8	pF	V <sub>CB</sub> =5V I <sub>E</sub> =0 f=1MHz
Noise Figure	NF		3		4	dB	I <sub>C</sub> =10μA V <sub>CE</sub> =5V R <sub>G</sub> =10kΩ f=10Hz-15KHz

**MICRO ELECTRONICS LTD.**

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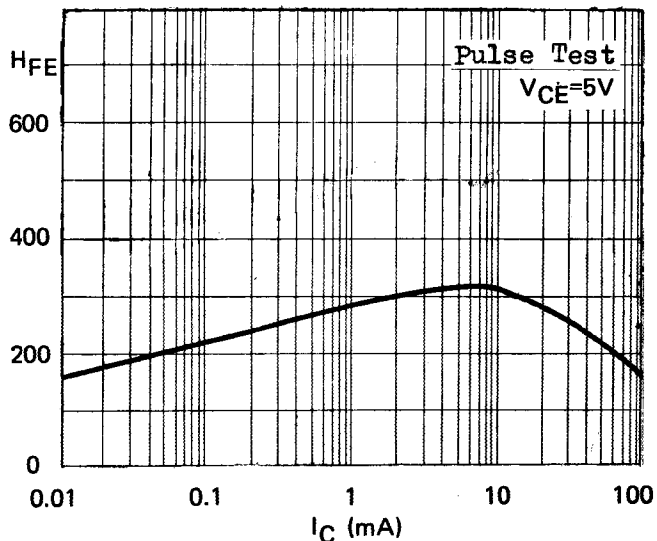
PARAMETER	SYMBOL	2N930	2N3548	UNIT	TEST CONDITIONS
		MIN	MAX		
Small Signal Current Gain	$h_{fe}$	150	600		$I_C=1mA$ $V_{CE}=5V$ $f=1KHz$

COMMON BASE h - PARAMETERS (for 2N930 only)

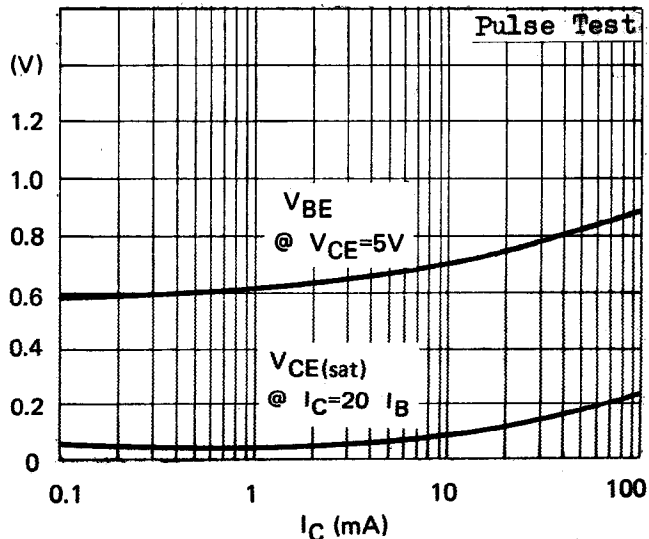
h - PARAMETER	SYMBOL	MIN	MAX	UNIT	TEST CONDITIONS
Input Impedance	$h_{ib}$	25	32	$\Omega$	$I_C=1mA$ $V_{CB}=5V$ $f=1KHz$
Output Admittance	$h_{ob}$		1	$\mu S$	
Voltage Feedback Ratio	$h_{rb}$		6	$\times 10^{-4}$	

TYPICAL CHARACTERISTICS AT  $T_A=25^\circ C$

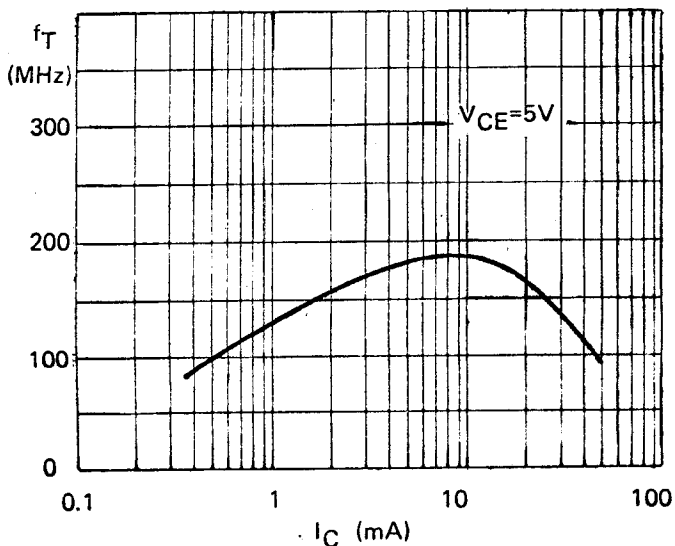
D.C. CURRENT GAIN vs COLLECTOR CURRENT



$V_{BE}$  AND  $V_{CE(sat)}$  vs COLLECTOR CURRENT



CURRENT GAIN - BANDWIDTH PRODUCT vs COLLECTOR CURRENT



BROAD BAND NOISE FIGURE vs COLLECTOR CURRENT

