

# 2N3019

# 2N3020

NPN SILICON AF MEDIUM POWER AMPLIFIERS & SWITCHES



THE 2N3019, 2N3020 ARE NPN SILICON PLANAR EPITAXIAL TRANSISTORS FOR AF MEDIUM POWER DRIVERS AND OUTPUTS, AS WELL AS FOR SWITCHING APPLICATIONS UP TO 1 AMPERE. THEY ARE COMPLEMENTARY TO THE PNP 2N4033, 2N4031.

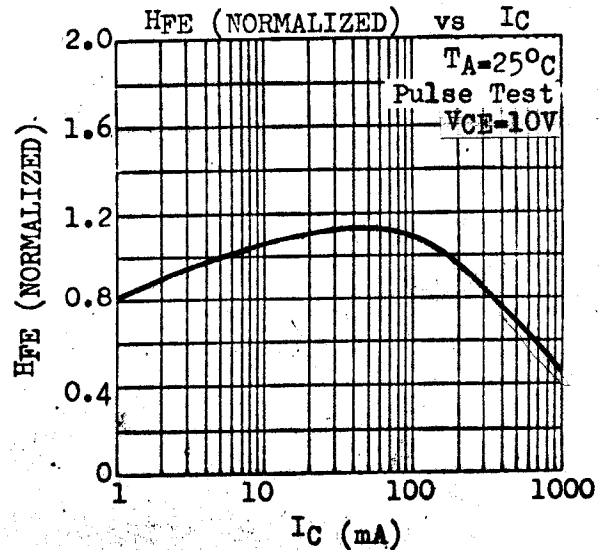
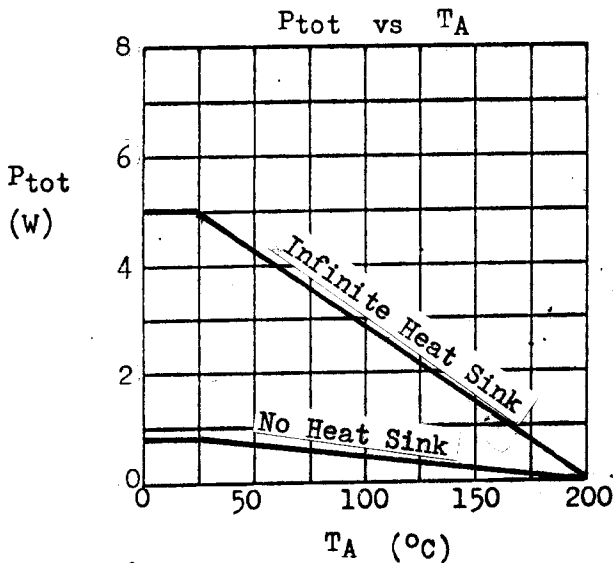
CASE TO-39



C E B

### ABSOLUTE MAXIMUM RATINGS

Collector-Base Voltage	VCBO	140V
Collector-Emitter Voltage	VCEO	80V
Emitter-Base Voltage	VEBO	7V
Collector Current	IC	1A
Total Power Dissipation ( $T_C \leq 25^\circ\text{C}$ )	Ptot	5W
( $T_A \leq 25^\circ\text{C}$ )		800mW
Operating Junction & Storage Temperature	Tj, Tstg	-65 to 200°C



**MICRO ELECTRONICS LTD.**

38 HUNG TO ROAD, KWUN TONG, HONG KONG. TELEX 43510  
KWUN TONG P. O. BOX 69477 CABLE ADDRESS "MICROTRON"  
TELEPHONE:- 3-430181-6 3-6933693 3-692423  
FAX: 3-410321

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

PARAMETER	SYMBOL	2N3019		2N3020		UNIT	TEST CONDITIONS
		MIN	MAX	MIN	MAX		
Collector-Base Breakdown Voltage	BVCBO	140		140		V	$I_C=0.1\text{mA}$ $I_E=0$
Collector-Emitter Breakdown Voltage	LVCEO *	80		80		V	$I_C=30\text{mA}$ $I_B=0$
Emitter-Base Breakdown Voltage	BVEBO	7		7		V	$I_E=0.1\text{mA}$ $I_C=0$
Collector Cutoff Current	ICBO		10		10	nA	$V_{CB}=90\text{V}$ $I_E=0$
			10		10	$\mu\text{A}$	$V_{CB}=90\text{V}$ $I_E=0$ $T_A=150^\circ\text{C}$
Emitter Cutoff Current	IEBO		10		10	nA	$V_{EB}=5\text{V}$ $I_C=0$
Collector-Emitter Saturation Voltage	VCE(sat) *		0.2		0.2	V	$I_C=150\text{mA}$ $I_B=15\text{mA}$
			0.5		0.5	V	$I_C=500\text{mA}$ $I_B=50\text{mA}$
Base-Emitter Saturation Voltage	VBE(sat) *	1.1		1.1		V	$I_C=150\text{mA}$ $I_B=15\text{mA}$
D.C. Current Gain	HFE *	50		30	100		$I_C=0.1\text{mA}$ $V_{CE}=10\text{V}$
		90		40	120		$I_C=10\text{mA}$ $V_{CE}=10\text{V}$
		100	300	40	120		$I_C=150\text{mA}$ $V_{CE}=10\text{V}$
		50		30	100		$I_C=500\text{mA}$ $V_{CE}=10\text{V}$
		15		15			$I_C=1\text{A}$ $V_{CE}=10\text{V}$
		40					$I_C=150\text{mA}$ $V_{CE}=10\text{V}$ $T_A=-55^\circ\text{C}$
Current Gain-Bandwidth Product	$f_T$	100		80		MHz	$I_C=50\text{mA}$ $V_{CE}=10\text{V}$
Collector-Base Capacitance	Cob		12		12	pF	$V_{CB}=10\text{V}$ $I_E=0$
Emitter-Base Capacitance	Cib		60		60	pF	$V_{EB}=0.5\text{V}$ $I_C=0$ $f=1\text{MHz}$
Collector-Base Time Constant	Corbb'		400		400	pS	$I_C=10\text{mA}$ $V_{CE}=10\text{V}$ $f=4\text{MHz}$
Noise Figure	NF		4			dB	$I_C=0.1\text{mA}$ $V_{CE}=10\text{V}$ $R_G=1\text{K}\Omega$ $f=1\text{kHz}$
Small Signal Current Gain ( $f=1\text{kHz}$ )	$h_{fe}$	80	400	30	200		$I_C=1\text{mA}$ $V_{CE}=5\text{V}$

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

