



## 2SA1020

## PNP SILICON TRANSISTOR

### SILICON PNP EPITAXIAL TRANSISTOR

#### DESCRIPTION

The UTC **2SA1020** is designed for power amplifier and power switching applications.

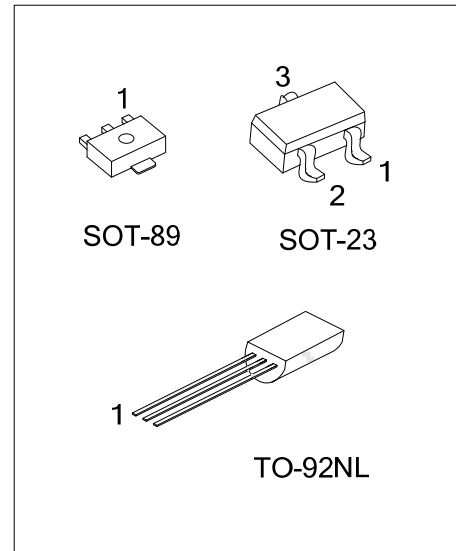
#### FEATURES

\*Low collector saturation voltage:

$$V_{CE(SAT)} = -0.5V_{(MAX)} \quad (I_C = -1A)$$

\*High speed switching time:  $t_{STG} = 1.0\mu s$  (TYP)

\*Complement to UTC 2SC2655



#### ORDERING INFORMATION

Ordering Number			Package	Pin Assignment			Packing
Normal	Lead Free	Halogen Free		1	2	3	
2SA1020-x-AE3-R	2SA1020L-x-AE3-R	2SA1020G-x-AE3-R	SOT-23	E	B	C	Tape Reel
2SA1020-x-AB3-R	2SA1020L-x-AB3-R	2SA1020G-x-AB3-R	SOT-89	B	C	E	Tape Reel
2SA1020-x-T9N-B	2SA1020L-x-T9N-B	2SA1020G-x-T9N-B	TO-92NL	E	C	B	Tape Box
2SA1020-x-T9N-K	2SA1020L-x-T9N-K	2SA1020G-x-T9N-K	TO-92NL	E	C	B	Bulk

<p>2SA1020L-x-AE3-R</p> <p>(1) Packing Type (2) Package Type (3) Rank (4) Lead Free</p>	<p>(1) B: Tape Box, K: Bulk, R: Tape Reel (2) AE3: SOT-23, AB3: SOT-89, T9N: TO-92NL (3) x: refer to Classification of <math>h_{FE1}</math> (4) G: Halogen Free, L: Lead Free, Blank: Pb/Sn</p>
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# 2SA1020

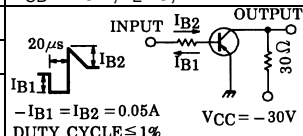
## PNP SILICON TRANSISTOR

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		$V_{CBO}$	-50	V
Collector-Emitter Voltage		$V_{CEO}$	-50	V
Emitter-Base Voltage		$V_{EBO}$	-5	V
Collector Current		$I_C$	-2	A
Collector Power Dissipation	TO-92NL	$P_C$	900	mW
	SOT-23		300	mW
	SOT-89		500	mW
Junction Temperature		$T_J$	150	°C
Storage Temperature		$T_{STG}$	-55 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

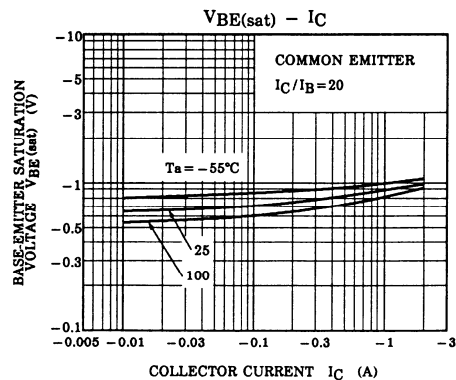
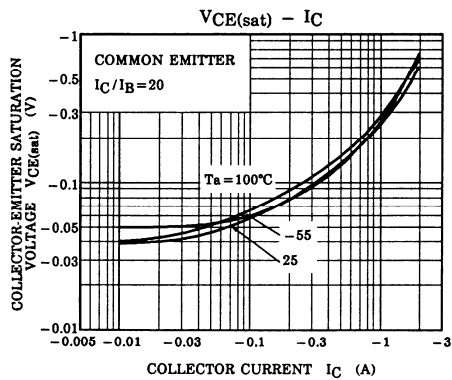
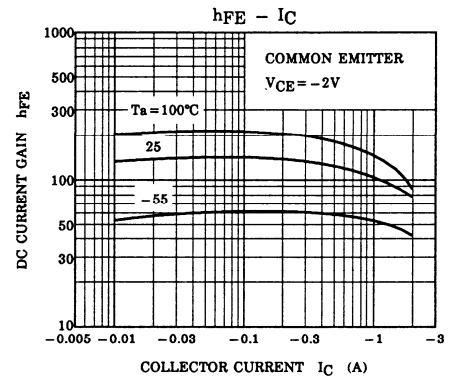
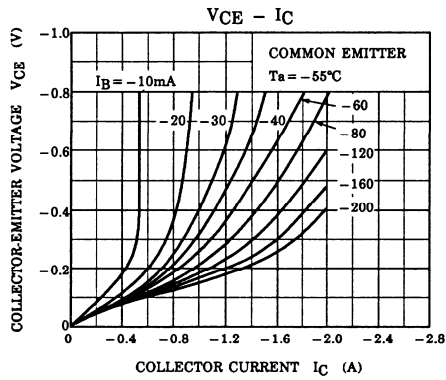
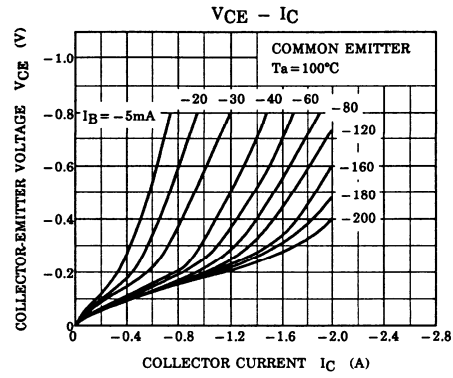
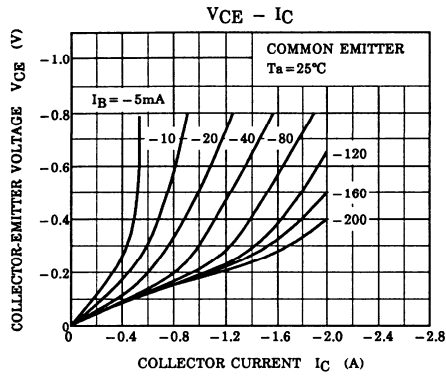
■ ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector to Emitter Breakdown Voltage		$BV_{CEO}$	$I_C = -10mA, I_B = 0$	-50			V
Collector Cut-off Current		$I_{CBO}$	$V_{CB} = -50V, I_E = 0$			-1.0	$\mu A$
Emitter Cut-off Current		$I_{EBO}$	$V_{EB} = -5V, I_C = 0$			-1.0	$\mu A$
DC Current Gain		$h_{FE1}$	$V_{CE} = -2V, I_C = -0.5A$	70		240	
		$h_{FE2}$	$V_{CE} = -2V, I_C = -1.5A$	40			
Collector to Emitter Saturation Voltage		$V_{CE(SAT)}$	$I_C = -1A, I_B = -0.05A$			-0.5	V
Base to Emitter Saturation Voltage		$V_{BE(SAT)}$	$I_C = -1A, I_B = -0.05A$			-1.2	V
Transition Frequency		$f_T$	$V_{CE} = -2V, I_C = -0.5A$		100		MHz
Collector Output Capacitance		$C_{OB}$	$V_{CB} = -10V, I_E = 0, f = 1MHz$		40		pF
Switching Time	Turn-on Time	$t_{ON}$	 <p> <math>20\mu s</math>                      INPUT <math>I_{B2}</math>  <math>I_{B1}</math>  <math>30\Omega</math>                      OUTPUT  <math>V_{CC} = -30V</math>  <math>-I_{B1} = I_{B2} = 0.05A</math>                      DUTY CYCLE <math>\leq 1\%</math> </p>		0.1		$\mu s$
	Storage Time	$t_{STG}$			1.0		$\mu s$
	Fall Time	$t_F$				0.1	

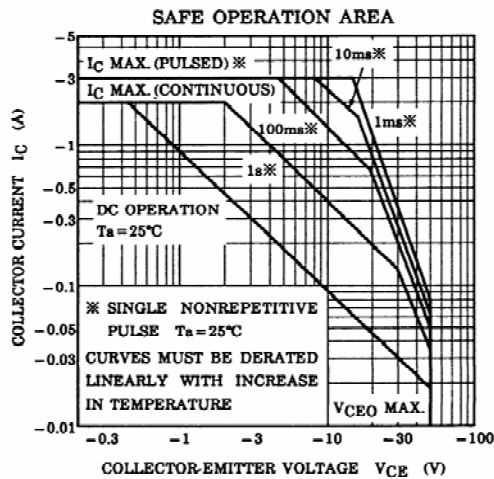
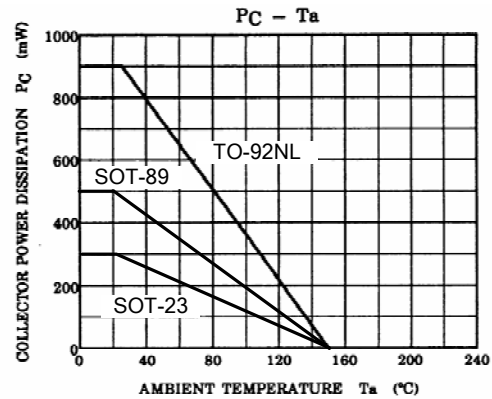
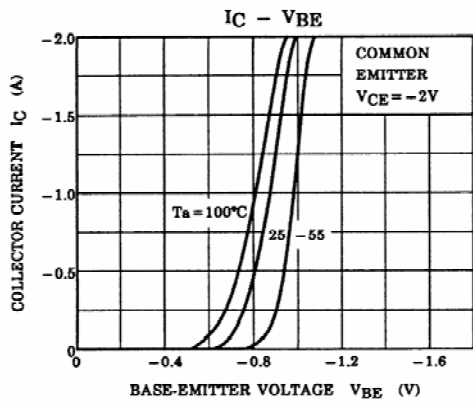
■ CLASSIFICATION OF  $h_{FE1}$

RANK	O	Y
RANGE	70 - 140	120 - 240

## TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



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