



2SA1020

PNP SILICON TRANSISTOR

SILICON PNP EPITAXIAL TRANSISTOR

DESCRIPTION

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

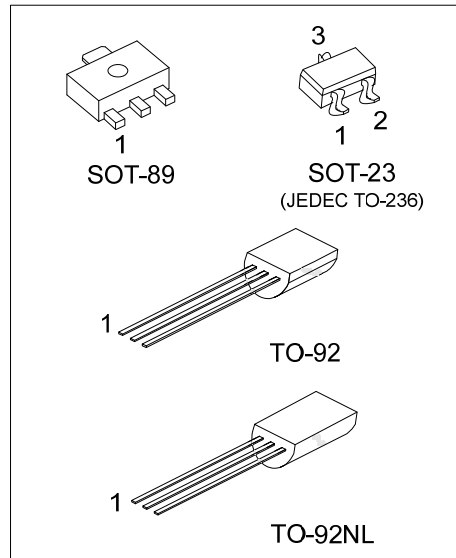
FEATURES

*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
Lead Free	Halogen Free		1	2	3	
2SA1020L-x-AE3-R	2SA1020G-x-AE3-R	SOT-23	B	E	C	Tape Reel
2SA1020L-x-AB3-R	2SA1020G-x-AB3-R	SOT-89	B	C	E	Tape Reel
2SA1020L-x-T92-B	2SA1020G-x-T92-B	TO-92	E	B	C	Tape Box
2SA1020L-x-T92-K	2SA1020G-x-T92-K	TO-92	E	B	C	Bulk
2SA1020L-x-T9N-B	2SA1020G-x-T9N-B	TO-92NL	E	C	B	Tape Box
2SA1020L-x-T9N-K	2SA1020G-x-T9N-K	TO-92NL	E	C	B	Bulk

Note: Pin Assignment: B: Base E: Emitter C: Collector

<p>2SA1020G-x-AE3-R</p> <p>(1) Packing Type (2) Package Type (3) Rank (4) Green Package</p>	<p>(1) B: Tape Box, K: Bulk, R: Tape Reel (2) AE3: SOT-23, AB3: SOT-89, T92: TO-92, T9N: TO-92NL (3) x: refer to Classification of h_{FE1} (4) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING

SOT-89	SOT-23
<p>Date Code 2SA1020 L: Lead Free G: Halogen Free</p>	<p>A10 L: Lead Free G: Halogen Free</p>
TO-92	TO-92NL
<p>UTC A1020 L: Lead Free G: Halogen Free Date Code</p>	<p>UTC 2SA1020 L: Lead Free G: Halogen Free Date Code</p>

■ ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$, 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	SOT-23	P_C	300	mW
	SOT-89		500	mW
	TO-92/TO-92NL		900	mW
Junction Temperature		T_J	+150	$^\circ\text{C}$
Operating Temperature		T_{OPR}	-40 ~ +150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^\circ\text{C}$

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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-23	θ_{JA}	417	$^\circ\text{C/W}$
	SOT-89		250	
	TO-92/TO-92NL		125	
Junction to Case	SOT-23	θ_{JC}	208.3	$^\circ\text{C/W}$
	SOT-89		156.3	
	TO-92/TO-92NL		83.3	

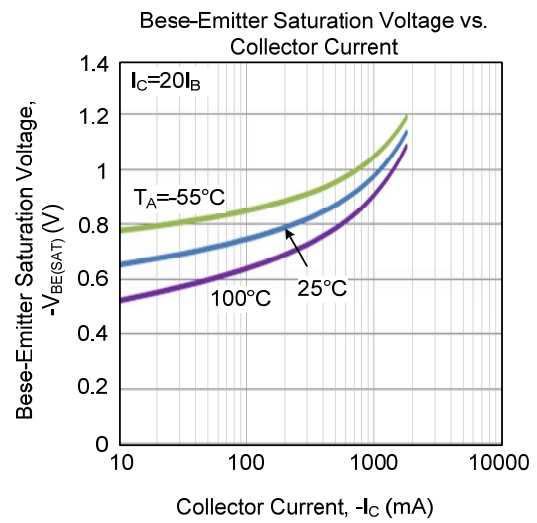
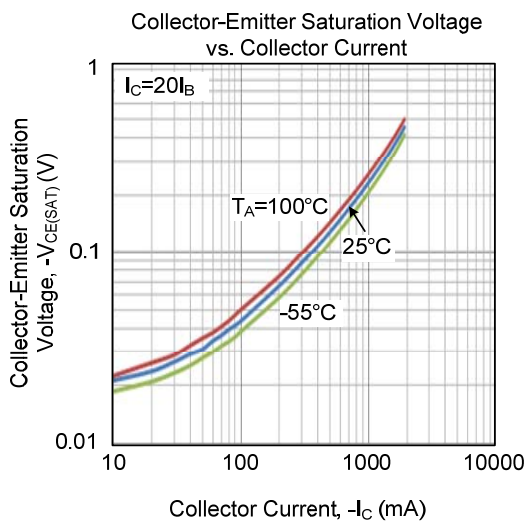
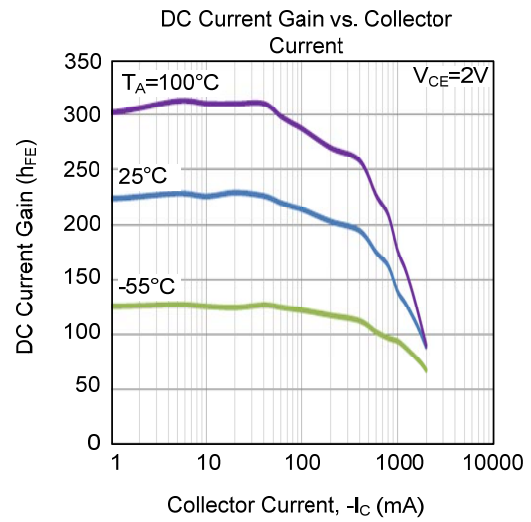
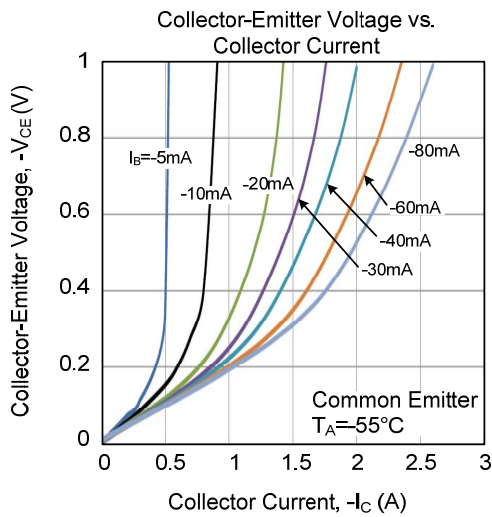
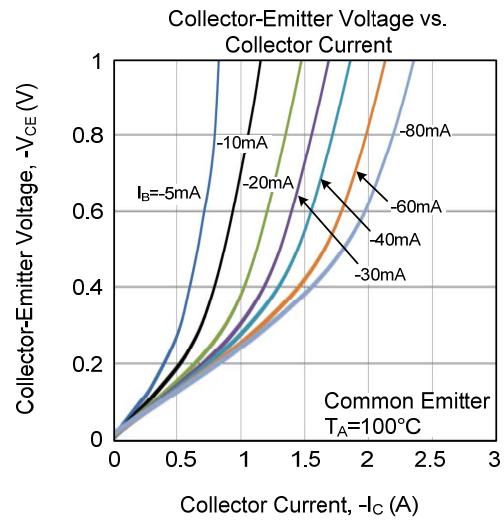
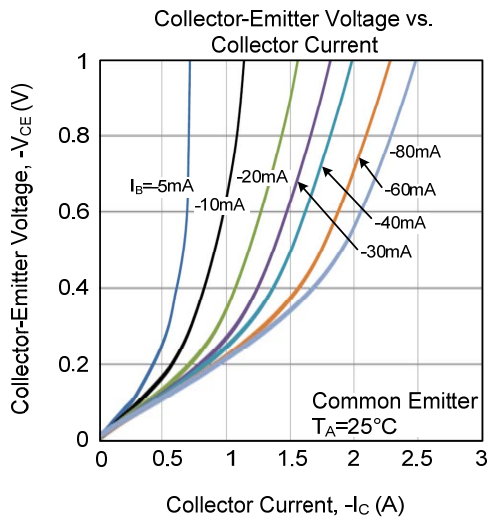
■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector to Emitter Breakdown Voltage		BV_{CEO}	$I_C=-10\text{mA}$, $I_B=0$	-50			V
Collector Cut-off Current		I_{CBO}	$V_{CB}=-50\text{V}$, $I_E=0$			-1.0	μA
Emitter Cut-off Current		I_{EBO}	$V_{EB}=-5\text{V}$, $I_C=0$			-1.0	μA
DC Current Gain		h_{FE1}	$V_{CE}=-2\text{V}$, $I_C=-0.5\text{A}$	70		240	
		h_{FE2}	$V_{CE}=-2\text{V}$, $I_C=-1.5\text{A}$	40			
Collector to Emitter Saturation Voltage		$V_{CE(SAT)}$	$I_C=-1\text{A}$, $I_B=-0.05\text{A}$			-0.5	V
Base to Emitter Saturation Voltage		$V_{BE(SAT)}$	$I_C=-1\text{A}$, $I_B=-0.05\text{A}$			-1.2	V
Transition Frequency		f_T	$V_{CE}=-2\text{V}$, $I_C=-0.5\text{A}$		100		MHz
Collector Output Capacitance		C_{OB}	$V_{CB}=-10\text{V}$, $I_E=0$, $f=1\text{MHz}$		80		pF
Input Capacitance		C_{ibo}	$V_{BE}=-0.5\text{V}$, $f=1\text{MHz}$		310		pF
Switching Time	Turn-on Time	t_{ON}	<p> $20\mu\text{s}$ INPUT I_{B2} I_{B1} I_{B2} OUTPUT $-I_{B1} = I_{B2} = 0.05\text{A}$ $V_{CC} = -30\text{V}$ DUTY CYCLE $\leq 1\%$ </p>		0.1		μs
	Storage Time	t_{STG}			1.0		μs
	Fall Time	t_F				0.1	

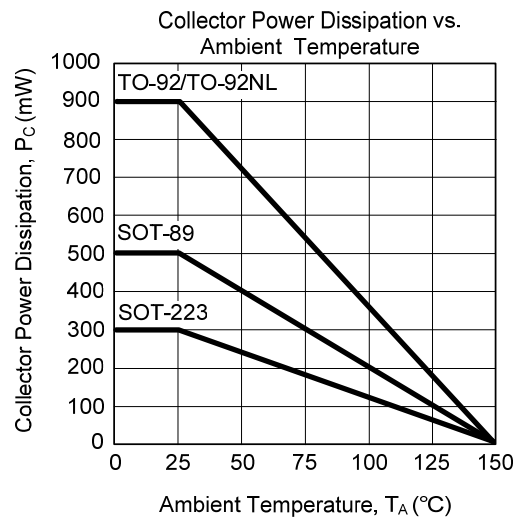
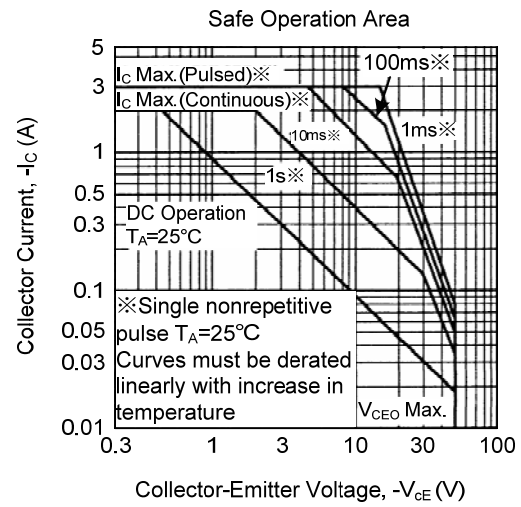
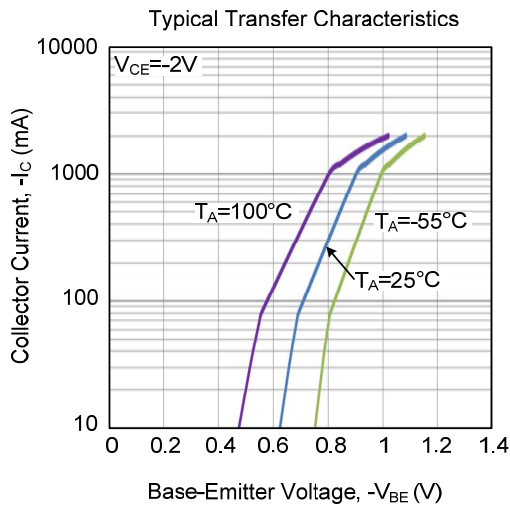
■ CLASSIFICATION OF h_{FE1}

RANK	O	Y
RANGE	70 - 140	120 - 240

■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



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