



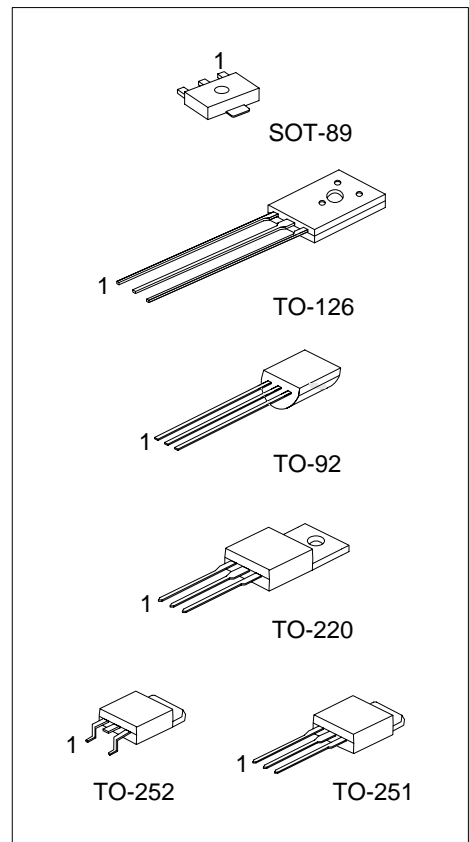
# 2SD1060

## NPN SILICON TRANSISTOR

### NPN PLANAR SILICON TRANSISTOR

■ **FEATURES**

\* Low collector-to-emitter saturation voltage:  
 $V_{CE(SAT)}=0.4V \text{ max}/I_C=3A, I_B=0.3A$



\*Pb-free plating product number: 2SD1060L

■ **ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
2SD1060-x-AB3-R	2SD1060L-x-AB3-R	SOT-89	B	C	E	Tape Reel
2SD1060-x-T60-K	2SD1060L-x-T60-K	TO-126	B	C	E	Bulk
2SD1060-x-T92-B	2SD1060L-x-T92-B	TO-92	E	C	B	Tape Box
2SD1060-x-T92-K	2SD1060L-x-T92-K	TO-92	E	C	B	Bulk
2SD1060-x-TA3-T	2SD1060L-x-TA3-T	TO-220	B	C	E	Tube
2SD1060-x-TM3-T	2SD1060L-x-TM3-T	TO-251	B	C	E	Tube
2SD1060-x-TN3-R	2SD1060L-x-TN3-R	TO-252	B	C	E	Tape Reel
2SD1060-x-TN3-T	2SD1060L-x-TN3-T	TO-252	B	C	E	Tube

<p>2SD1060L-x-AB3-R</p>	<p>(1)Packing Type                  (2)Package Type                  (3)Rank                  (4)Lead Plating</p> <p>(1)B: Tape Box, K: Bulk, R: Tape Reel, T: Tube                  (2) AB3: SOT-89, T60: TO-126, T92: TO-92, TA3: TO-220, TM3: TO-251, TN3: TO-252                  (3) x: refer to Classification of <math>h_{FE1}</math>                  (4) L: Lead Free Plating, Blank: Pb/Sn</p>
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■ ABSOLUTE MAXIMUM RATINGS (Ta=25 )

PARAMETER		SYMBOL	RATINGS	UNIT
Collector to Base Voltage		$V_{CBO}$	60	V
Collector to Emitter Voltage		$V_{CEO}$	50	V
Emitter to Base Voltage		$V_{EBO}$	6	V
Collector Current		$I_C$	5	A
Collector Current (Pulse)		$I_{CP}$	9	A
Collector Dissipation	SOT-89	$P_C$	500	mW
	TO-126/TO-251		1	W
	TO-252/TO-220		2	W
	TO-92		625	mW
Junction Temperature		$T_J$	+150	
Storage Temperature		$T_{STG}$	-40 ~ +150	

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.

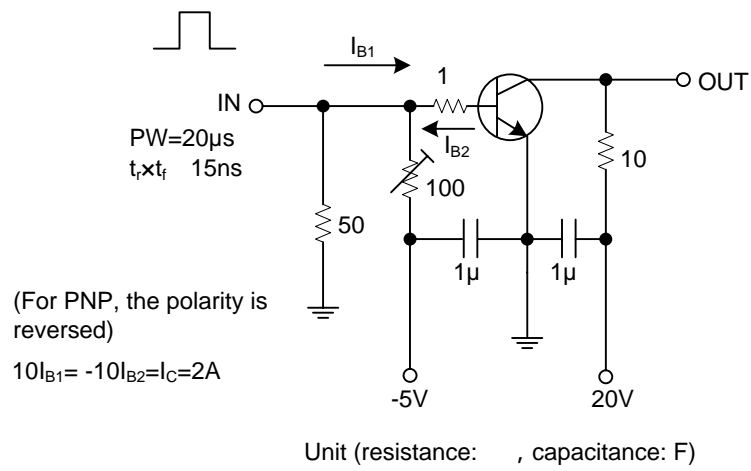
■ ELECTRICAL CHARACTERISTICS (Ta=25 )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-to-Base Breakdown Voltage	$BV_{CBO}$	$I_C = 1\text{mA}, I_E = 0$	60			V
Collector-to-Emitter Breakdown Voltage	$BV_{CEO}$	$I_C = 1\text{mA}, R_{BE} = \infty$	50			V
Emitter-to-Base Breakdown Voltage	$BV_{EBO}$	$I_C = 0, I_E = 1\text{mA}$	6			V
Collector Cut-Off Current	$I_{CBO}$	$V_{CB} = 40\text{V}, I_E = 0$			0.1	mA
Emitter Cut-Off Current	$I_{EBO}$	$V_{EB} = 4\text{V}, I_C = 0$			0.1	mA
DC Current Gain	$h_{FE1}$	$V_{CE} = 2\text{V}, I_C = 1\text{A}$	70		360	
	$h_{FE2}$	$V_{CE} = 2\text{V}, I_C = 3\text{A}$	30			
Gain Bandwidth Product	$f_T$	$V_{CE} = 5\text{V}, I_C = 1\text{A}$		30		MHZ
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, f = 1\text{MHz}$		100		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = 3\text{A}, I_B = 0.3\text{A}$			0.4	V
Turn-ON Time	$t_{ON}$	See specified test circuit		0.1		$\mu\text{s}$
Storage Time	$t_{STG}$	See specified test circuit		1.4		$\mu\text{s}$
Fall Time	$t_F$	See specified test circuit		0.2		$\mu\text{s}$

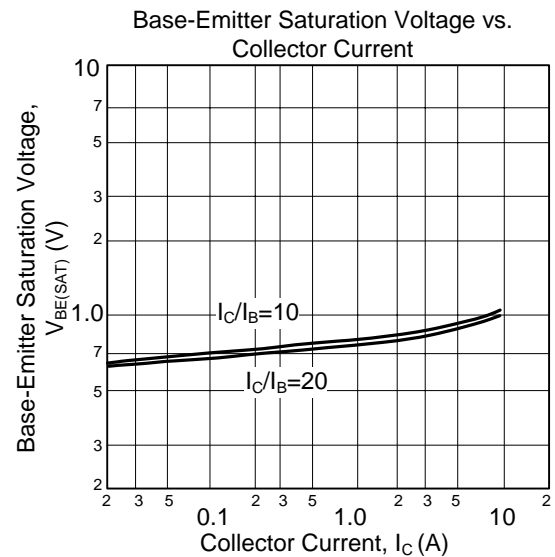
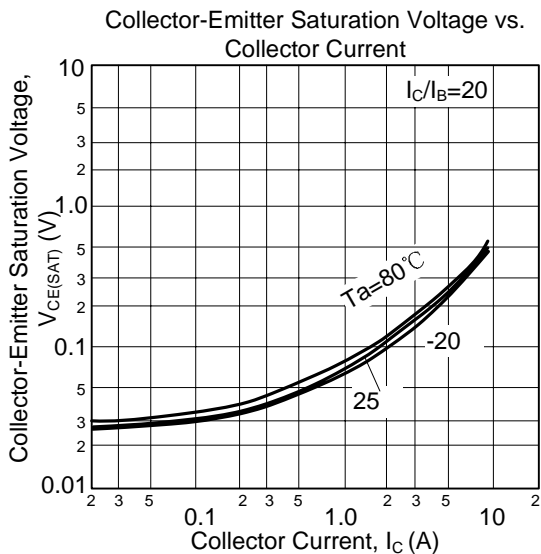
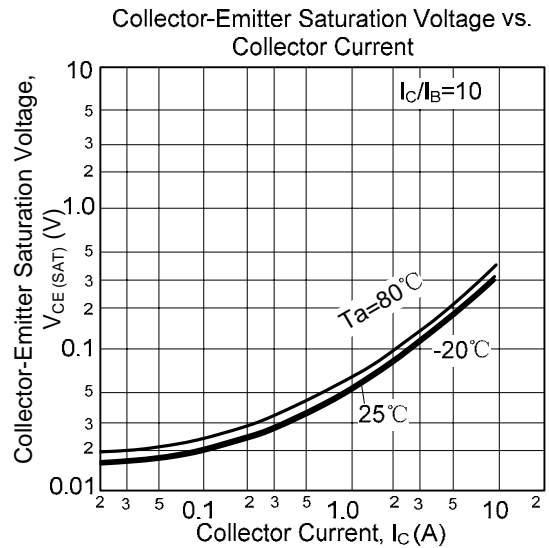
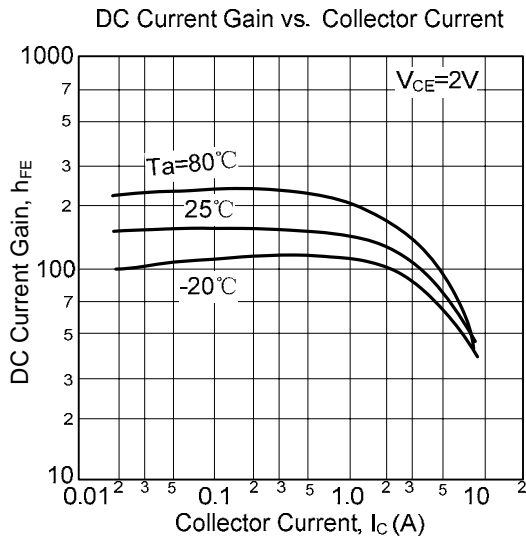
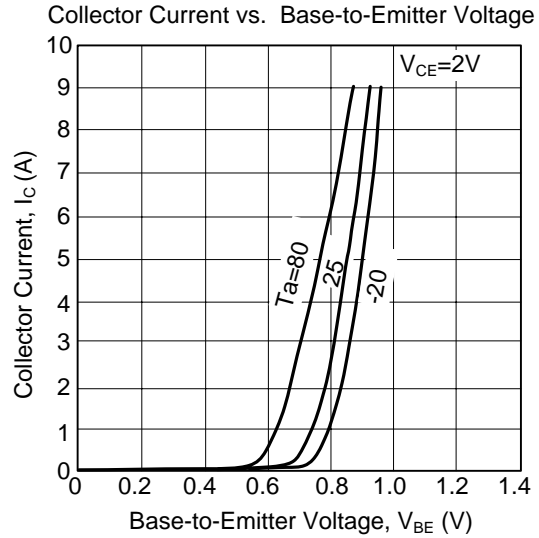
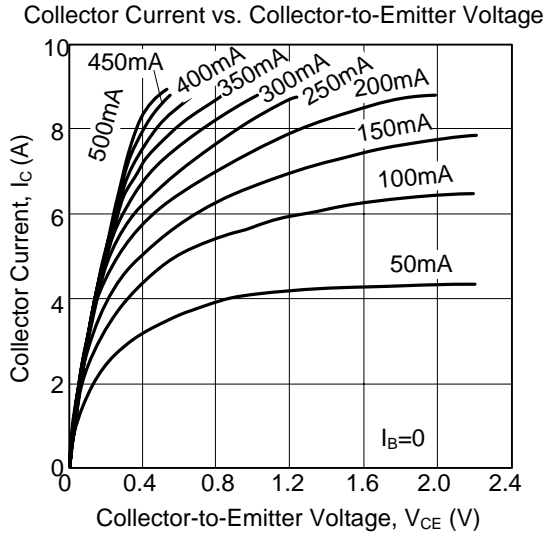
■ CLASSIFICATION of  $h_{FE1}$

RANK	Q	R	S
RANGE	70-140	100-200	180-360

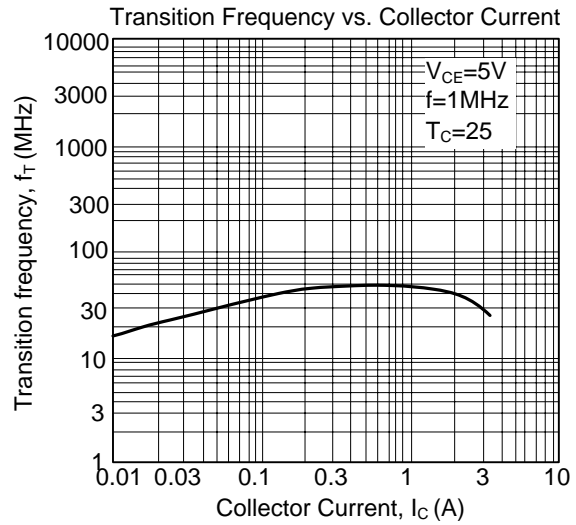
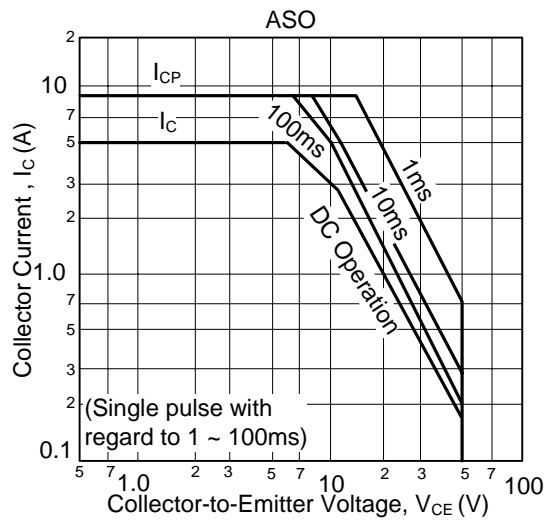
### SWITCHING TIME TEST CIRCUIT



■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



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