



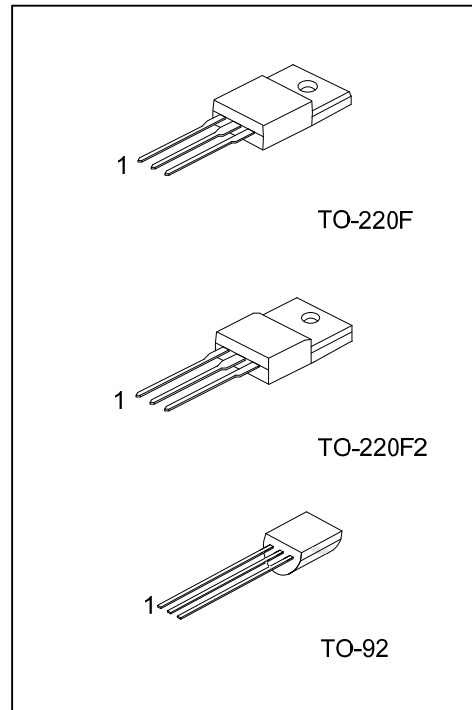
# X1049A

## NPN SILICON TRANSISTOR

### HIGH GAIN TRANSISTOR

■ FEATURES

- \*  $V_{CEV} = 80V$
- \* High Gain
- \* 20 Amps pulse current



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
X1049AL-TF3-T	X1049AG-TF3-T	TO-220F	B	C	E	Tube
X1049AL-TF2-T	X1049AG-TF2-T	TO-220F2	B	C	E	Tube
X1049AL-T92-B	X1049AG-T92-B	TO-92	E	B	C	Tape Box
X1049AL-T92-K	X1049AG-T92-K	TO-92	E	B	C	Bulk

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

<p>X1049AG-TF3-T</p>	<p>(1) T: Tube, B: Tape Box, K: Bulk          (2) TF3: TO-220F, TF2: TO-220F2, T92: TO-92          (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING

TO-220F / TO-220F2	TO-92

■ ABSOLUTE MAXIMUM RATING (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		V <sub>CBO</sub>	80	V
Collector-Emitter Voltage		V <sub>CEO</sub>	25	V
Emitter-Base Voltage		V <sub>EBO</sub>	5	V
Collector Current	DC	I <sub>C</sub>	4	A
	Pulse		20	A
Base Current		I <sub>B</sub>	500	mA
Power Dissipation (T <sub>A</sub> =25°C)	TO-220F	P <sub>D</sub>	2	W
	TO-220F2		2.1	
	TO-92		1	
Junction Temperature		T <sub>J</sub>	125	°C
Operating Temperature		T <sub>OPR</sub>	-20 ~ +85	°C
Storage Temperature		T <sub>STG</sub>	-40 ~ +150	°C

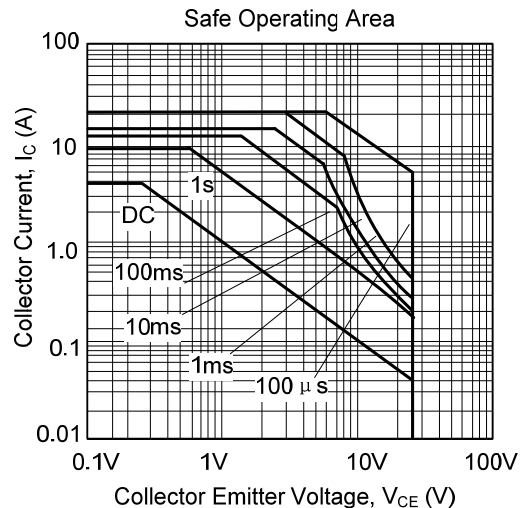
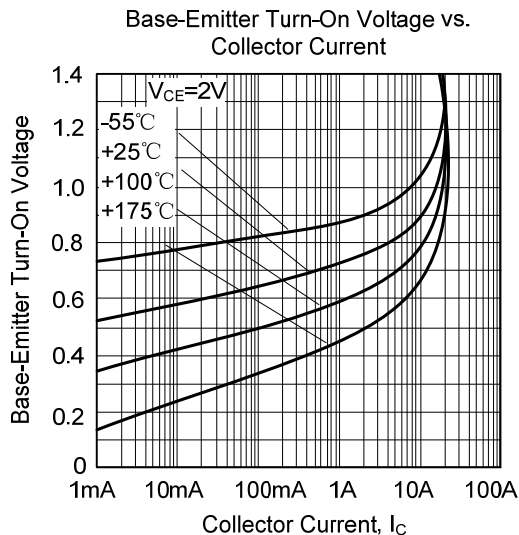
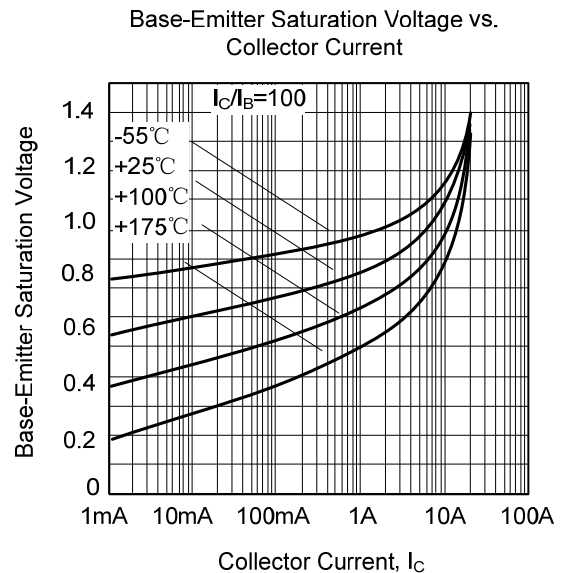
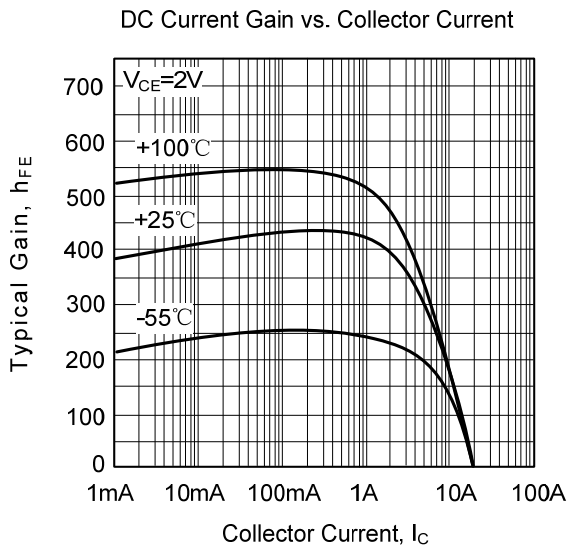
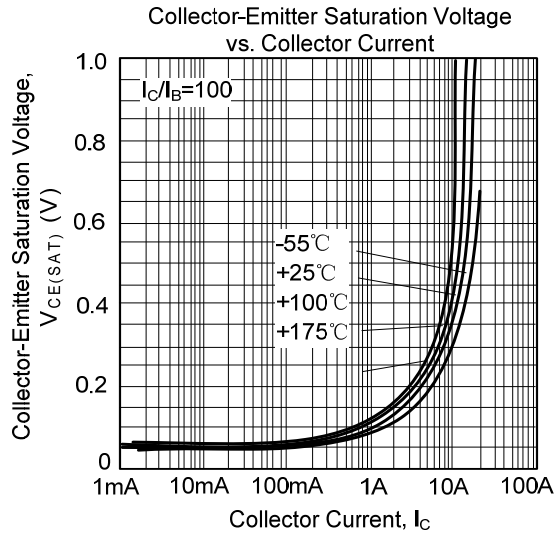
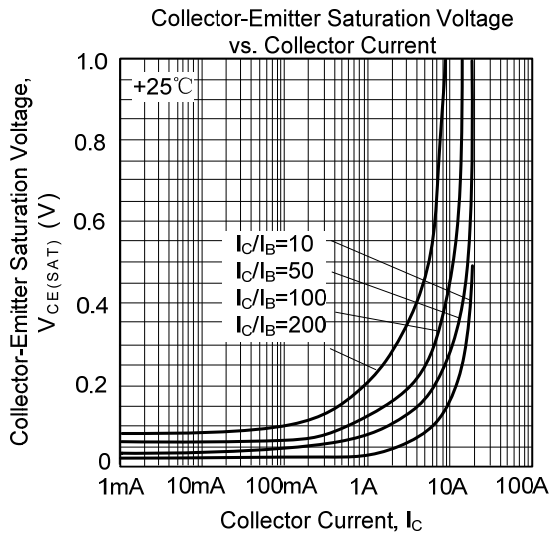
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified)

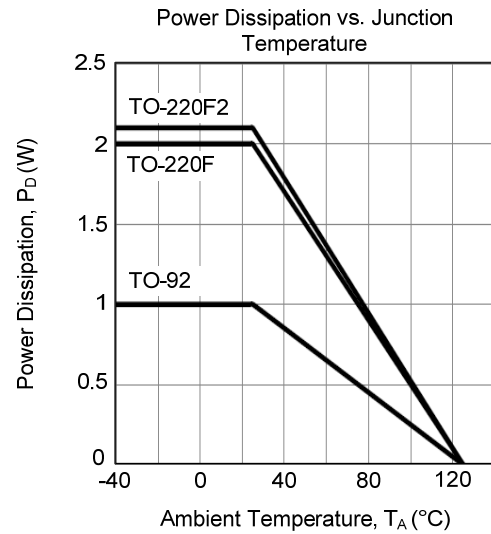
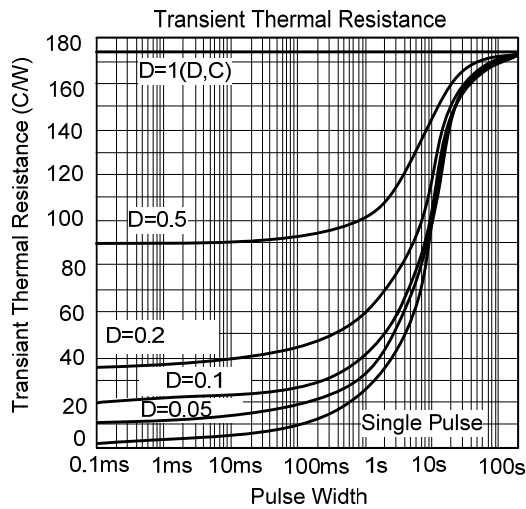
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	V <sub>CBO</sub>	I <sub>C</sub> =100μA	80	120		V
Collector-Emitter Breakdown Voltage	V <sub>CEO</sub>	I <sub>C</sub> =10mA	25	35		V
Collector-Emitter Breakdown Voltage	V <sub>CES</sub>	I <sub>C</sub> =100μA	80	120		V
Collector-Emitter Breakdown Voltage	V <sub>CEV</sub>	I <sub>C</sub> =100μA, V <sub>EB</sub> =1V	80	120		V
Emitter-Base Breakdown Voltage	V <sub>EBO</sub>	I <sub>E</sub> =100μA	5	8.75		V
Collector Cut-Off Current	I <sub>CBO</sub>	V <sub>CB</sub> =50V		0.3	10	nA
Emitter Cut-Off Current	I <sub>EBO</sub>	V <sub>EB</sub> =4V		0.3	10	nA
Collector Emitter Cut-Off Current	I <sub>CES</sub>	V <sub>CES</sub> =50V		0.3	10	nA
Collector-Emitter Saturation Voltage (Note)	V <sub>CE(SAT)</sub>	I <sub>C</sub> =0.5A, I <sub>B</sub> =10mA		30	70	mV
		I <sub>C</sub> =1A, I <sub>B</sub> =10mA		60	130	
		I <sub>C</sub> =2A, I <sub>B</sub> =10mA		125	280	
		I <sub>C</sub> =4A, I <sub>B</sub> =50mA		155	400	
Base-Emitter Saturation Voltage (Note)	V <sub>BE(SAT)</sub>	I <sub>C</sub> =4A, I <sub>B</sub> =50mA		890	980	mV
Base-Emitter Turn-On Voltage (Note)	V <sub>BE(ON)</sub>	I <sub>C</sub> =4A, V <sub>CE</sub> =2V		820	920	mV
DC Current Gain (Note)	h <sub>FE</sub>	I <sub>C</sub> =10mA, V <sub>CE</sub> =2V	250	430		
		I <sub>C</sub> =0.5A, V <sub>CE</sub> =2V	300	450		
		I <sub>C</sub> =1A, V <sub>CE</sub> =2V	300	450	1200	
		I <sub>C</sub> =4A, V <sub>CE</sub> =2V	200	350		
		I <sub>C</sub> =20A, V <sub>CE</sub> =2V	7			
Transition Frequency	f <sub>T</sub>	I <sub>C</sub> =50mA, V <sub>CE</sub> =10V, f=50MHz		180		MHz
Output Capacitance	C <sub>OBO</sub>	V <sub>CB</sub> =10V, f=1MHz		45	60	pF
Turn-On Time	t <sub>ON</sub>	I <sub>C</sub> =4A, I <sub>B</sub> =40mA, V <sub>CC</sub> =10V		125		ns
Turn-Off Time	t <sub>OFF</sub>	I <sub>C</sub> =4A, I <sub>B</sub> =±40mA, V <sub>CC</sub> =10V		380		ns

Note: Measured under pulsed conditions. Pulse width=300μs. Duty cycle ≤2%

## TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



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