



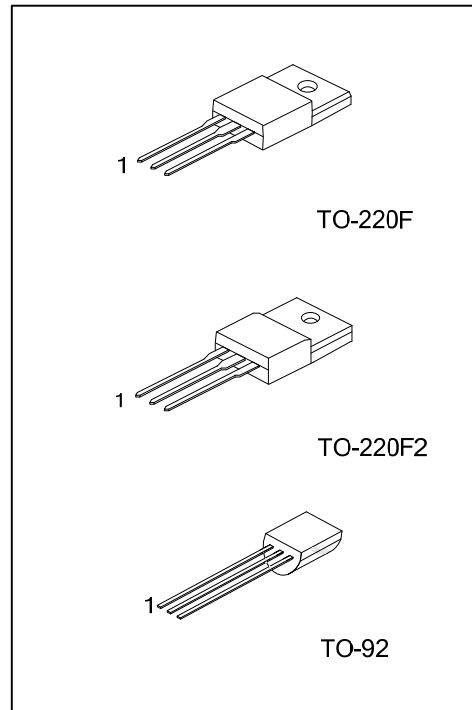
X1049A

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

<p>X1049AL-TF3-T</p>	<p>(1) T: Tube, B: Tape Box, K: Bulk (2) TF3: TO-220F, TF2: TO-220F2, T92: TO-92 (3) L: Lead Free, G: Halogen Free</p>
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■ MARKING

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

■ ABSOLUTE MAXIMUM RATING ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		V_{CBO}	80	V
Collector-Emitter Voltage		V_{CEO}	25	V
Emitter-Base Voltage		V_{EBO}	5	V
Collector Current	DC	I_C	4	A
	Pulse		20	A
Base Current		I_B	500	mA
Power Dissipation ($T_A=25^{\circ}\text{C}$)	TO-220F	P_D	2	W
	TO-220F2		2.1	
	TO-92		1	
Junction Temperature		T_J	125	$^{\circ}\text{C}$
Operating Temperature		T_{OPR}	-20 ~ +85	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-40 ~ +150	$^{\circ}\text{C}$

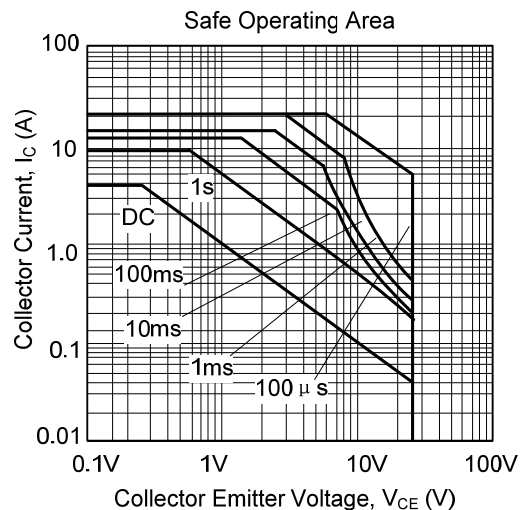
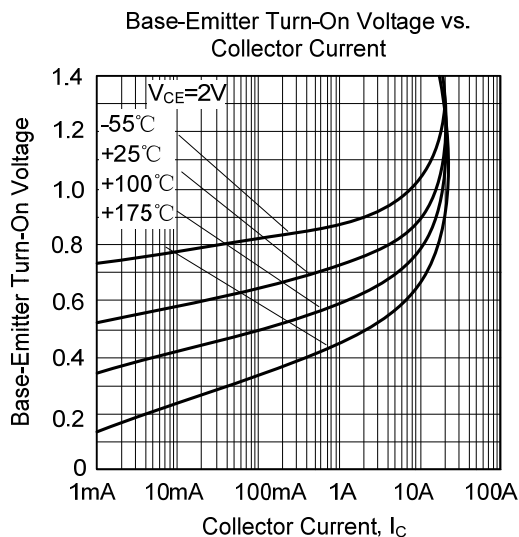
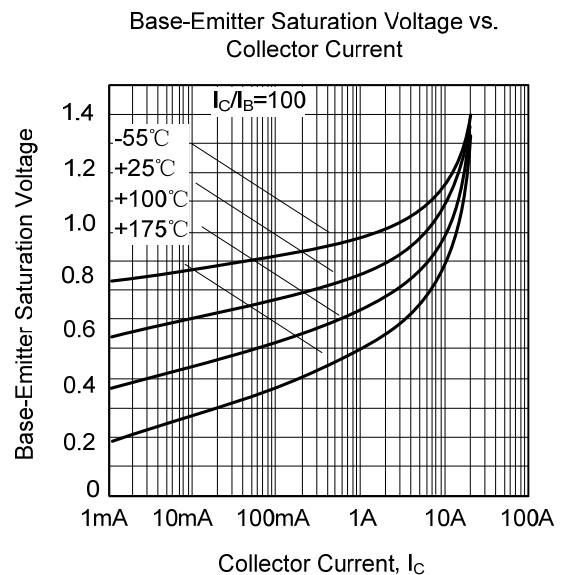
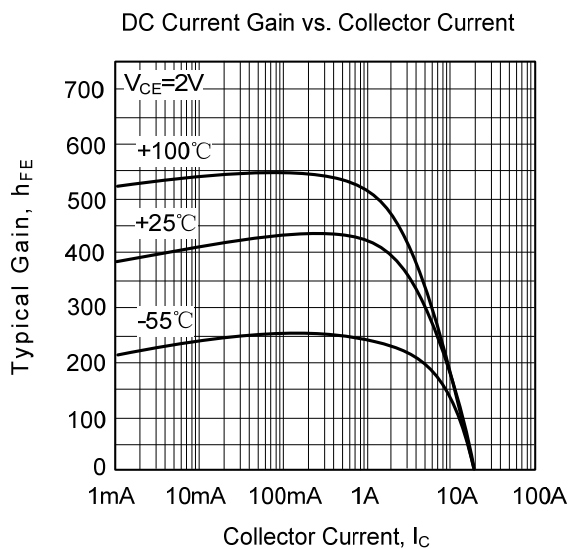
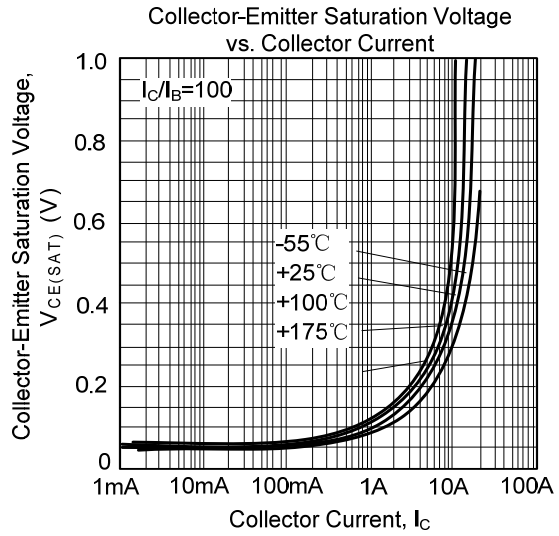
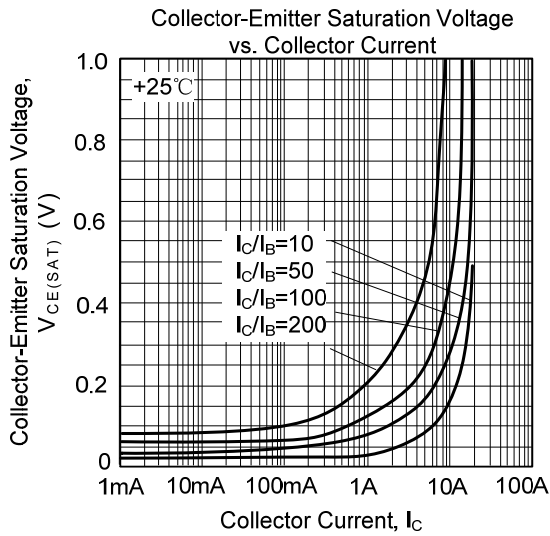
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

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

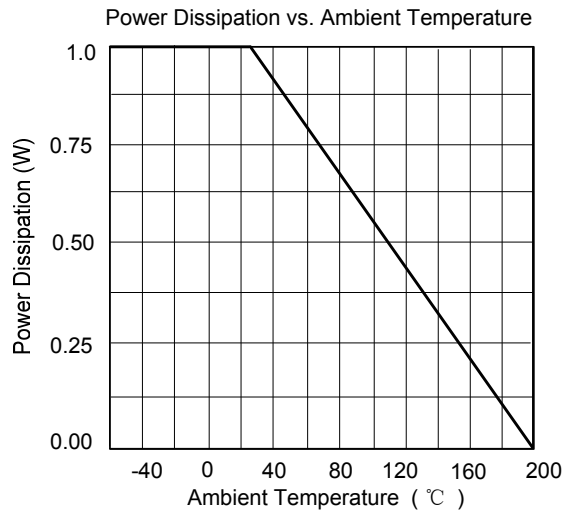
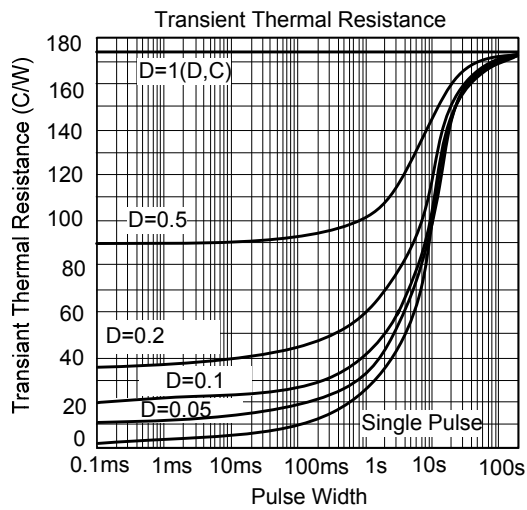
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	V_{CBO}	$I_C=100\mu\text{A}$	80	120		V
Collector-Emitter Breakdown Voltage	V_{CEO}	$I_C=10\text{mA}$	25	35		V
Collector-Emitter Breakdown Voltage	V_{CES}	$I_C=100\mu\text{A}$	80	120		V
Collector-Emitter Breakdown Voltage	V_{CEV}	$I_C=100\mu\text{A}, V_{EB}=1\text{V}$	80	120		V
Emitter-Base Breakdown Voltage	V_{EBO}	$I_E=100\mu\text{A}$	5	8.75		V
Collector Cut-Off Current	I_{CBO}	$V_{CB}=50\text{V}$		0.3	10	nA
Emitter Cut-Off Current	I_{EBO}	$V_{EB}=4\text{V}$		0.3	10	nA
Collector Emitter Cut-Off Current	I_{CES}	$V_{CES}=50\text{V}$		0.3	10	nA
Collector-Emitter Saturation Voltage (Note)	$V_{CE(SAT)}$	$I_C=0.5\text{A}, I_B=10\text{mA}$		30	70	mV
		$I_C=1\text{A}, I_B=10\text{mA}$		60	130	
		$I_C=2\text{A}, I_B=10\text{mA}$		125	280	
		$I_C=4\text{A}, I_B=50\text{mA}$		155	400	
Base-Emitter Saturation Voltage (Note)	$V_{BE(SAT)}$	$I_C=4\text{A}, I_B=50\text{mA}$		890	980	mV
Base-Emitter Turn-On Voltage (Note)	$V_{BE(ON)}$	$I_C=4\text{A}, V_{CE}=2\text{V}$		820	920	mV
DC Current Gain (Note)	h_{FE}	$I_C=10\text{mA}, V_{CE}=2\text{V}$	250	430		
		$I_C=0.5\text{A}, V_{CE}=2\text{V}$	300	450		
		$I_C=1\text{A}, V_{CE}=2\text{V}$	300	450	1200	
		$I_C=4\text{A}, V_{CE}=2\text{V}$	200	350		
		$I_C=20\text{A}, V_{CE}=2\text{V}$	7			
Transition Frequency	f_T	$I_C=50\text{mA}, V_{CE}=10\text{V}, f=50\text{MHz}$		180		MHz
Output Capacitance	C_{OBO}	$V_{CB}=10\text{V}, f=1\text{MHz}$		45	60	pF
Turn-On Time	t_{ON}	$I_C=4\text{A}, I_B=40\text{mA}, V_{CC}=10\text{V}$		125		ns
Turn-Off Time	t_{OFF}	$I_C=4\text{A}, I_B=\pm 40\text{mA}, V_{CC}=10\text{V}$		380		ns

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

TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



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