



## L13024

## NPN SILICON TRANSISTOR

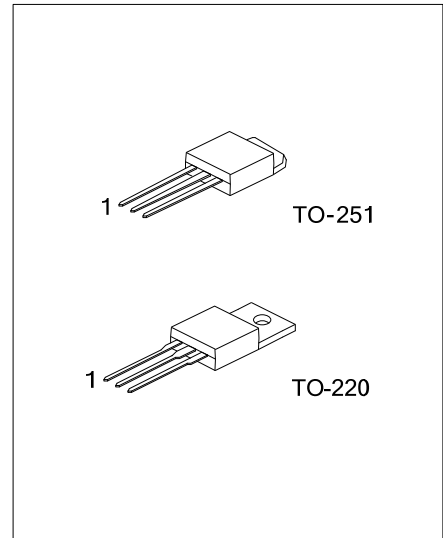
### NPN EPITAXIAL PLANAR TRANSISTOR

#### DESCRIPTION

The UTC **L13024** is designed for high voltage, high speed switching inductive circuits, and amplifier applications.

#### FEATURES

- \* High Speed Switching
- \* Low Saturation Voltage
- \* High Reliability



Lead-free: L13024L  
Halogen-free : L13024G

#### ORDERING INFORMATION

Ordering Number			Package	Pin Assignment			Packing
Normal	Lead Free	Halogen Free		1	2	3	
L13024-TA3-T	L13024L-TA3-T	L13024G-TA3-T	TO-220	B	C	E	Tube
L13024-TM3-T	L13024L-TM3-T	L13024G-TM3-T	TO-251	B	C	E	Tube

<p>L13024L-TA3-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Plating</p>	<p>(1) T: Tube</p> <p>(2) TA3: TO-220, TM3: TO-251</p> <p>(3) G: Halogen Free, L: Lead Free, Blank: Pb/Sn</p>
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■ ABSOLUTE MAXIMUM RATING ( $T_A=25^\circ\text{C}$ )

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Base Voltage	$V_{CBO}$	600	V
Collector-Emitter Voltage	$V_{CEO}$	400	V
Emitter-Base Voltage	$V_{EBO}$	8	V
Collector Current	DC	2	mA
	Pulse	4	
Base Current	DC	1	mA
	Pulse	2	
Total Power Dissipation ( $T_C=25^\circ\text{C}$ )	TO-220	35	W
	TO-251	20	
Junction Temperature	$T_J$	150	$^\circ\text{C}$
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.)

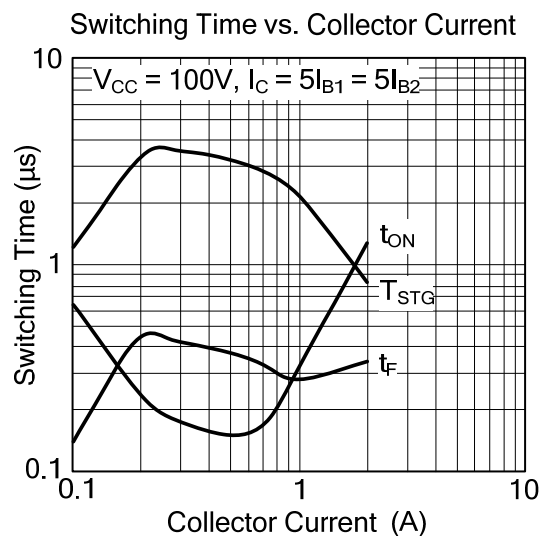
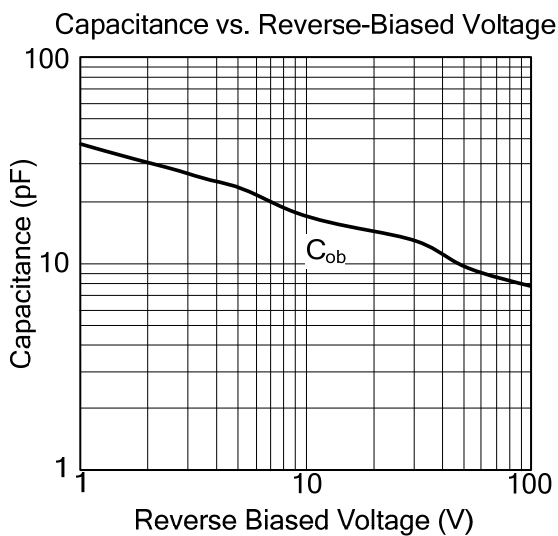
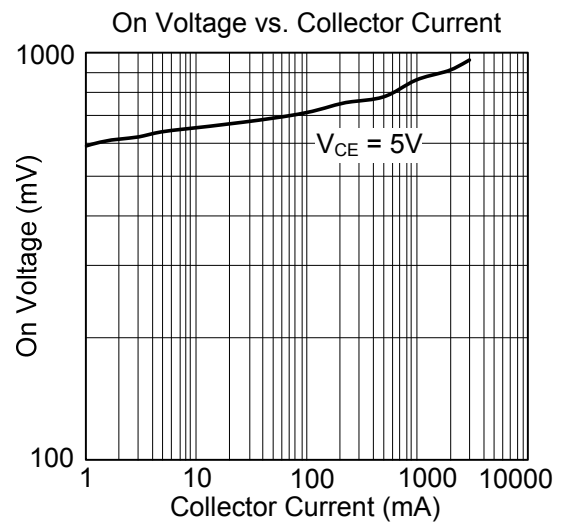
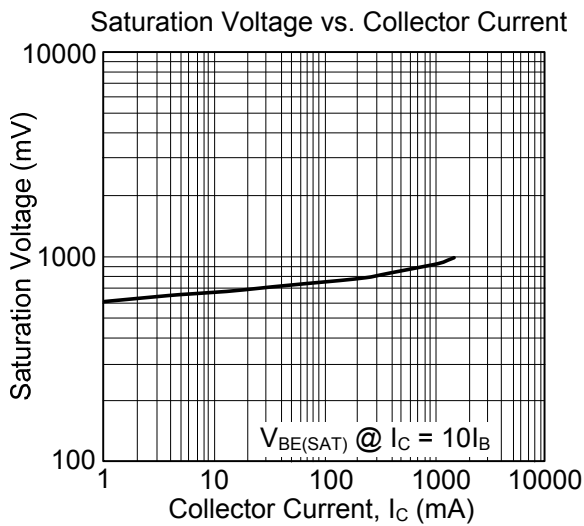
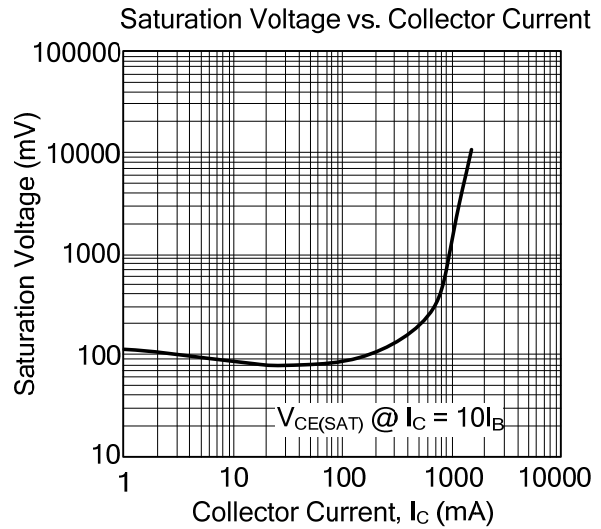
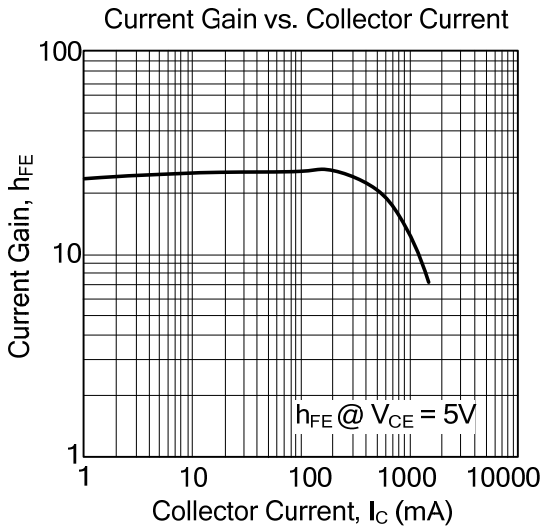
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	$BV_{CBO}$	$I_C=1\text{mA}$	600			V
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	$I_C=10\text{mA}$	400			V
Emitter-Base Breakdown Voltage	$BV_{EBO}$	$I_E=1\text{mA}$	8			V
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=600\text{V}$			10	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=9\text{V}, I_C=0$			10	$\mu\text{A}$
<b>ON CHARACTERISTICS</b>						
DC Current Gain(Note)	$h_{FE1}$	$V_{CE}=5\text{V}, I_C=0.3\text{A}$	10		40	
	$h_{FE2}$	$V_{CE}=5\text{V}, I_C=0.5\text{A}$	10			
	$h_{FE3}$	$V_{CE}=5\text{V}, I_C=1\text{A}$	6			
Collector-Emitter Saturation Voltage (Note)	$V_{CE(SAT)}$	$I_C=0.1\text{A}, I_B=10\text{mA}$			0.3	V
		$I_C=0.3\text{A}, I_B=30\text{mA}$			0.8	
Base-Emitter Saturation Voltage (Note)	$V_{BE(SAT)}$	$I_C=0.1\text{A}, I_B=10\text{mA}$			0.9	V
		$I_C=0.3\text{A}, I_B=30\text{mA}$			1.2	
<b>SWITCHING CHARACTERISTICS</b>						
Gain-Bandwidth Product	$f_T$	$V_{CE}=10\text{V}, I_C=0.3\text{A}, f=1\text{MHz}$	15			MHz

Note: Pulse Test : Pulse Width  $\leq 380\mu\text{s}$ , Duty Cycle  $\leq 2\%$

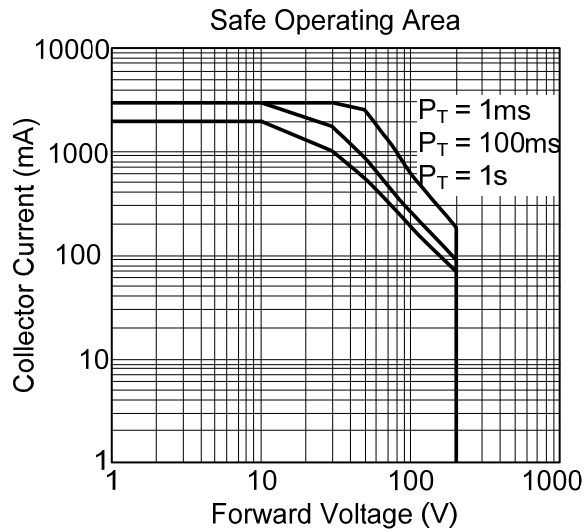
■ CLASSIFICATION OF  $h_{FE1}$

RANK	B1	B2	B3	B4	B5	B6
Range	10 ~ 17	13 ~ 22	18 ~ 27	23 ~ 32	28 ~ 37	33 ~ 40

### TYPICAL CHARACTERISTICS



### ■ TYPICAL CHARACTERISTICS(Cont.)



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