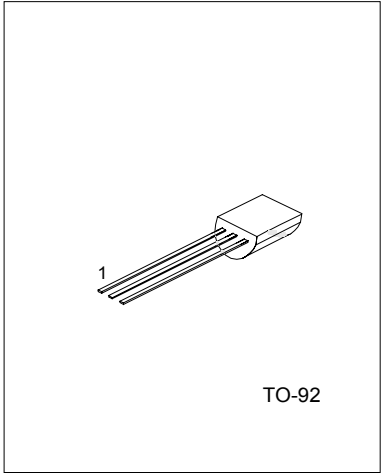


UTC PN2222A NPN EPITAXIAL SILICON TRANSISTOR

NPN GENERAL PURPOSE AMPLIFIER

FEATURES

*This device is for use as a medium power amplifier and switch requiring collector currents up to 500mA. Sourced from Process 19.



1:EMITTER 2:BASE 3:COLLECTOR

ABSOLUTE MAXIMUM RATINGS (Ta=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATING	UNIT
Collector-base voltage	V _{CB0}	75	V
Collector-emitter voltage	V _{CEO}	40	V
Emitter-base voltage	V _{EB0}	6	V
Collector current	I _c	1	A
Collector dissipation	P _c	625	mW
Junction Temperature	T _j	150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Note: These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Collector-base breakdown voltage	V _{(BR)CBO}	I _c =10μA, I _E =0	75			V
Collector-emitter breakdown voltage	V _{(BR)CEO}	I _c =10mA, I _B =0	40			V
Emitter-base breakdown voltage	V _{(BR)EBO}	I _E =10μA, I _c =0	6			V
Collector cutoff current	I _{CEX}	V _{CE} =60V, V _{EB} (OFF)=3.0V			10	nA
Collector cutoff current	I _{CBO}	V _{CB} =60V, I _E =0			0.01	μA
		V _{CB} =60V, I _E =0, T _A =150°C			10	μA
Emitter cutoff current	I _{EBO}	V _{EB} =3.0V, I _c =0			10	nA
Base cutoff current	I _{BL}	V _{CE} =60V, V _{EB} (OFF)=3.0V			20	nA

UTC PN2222A NPN EPITAXIAL SILICON TRANSISTOR

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
ON CHARACTERISTICS						
DC current gain	h_{FE}	$I_C=0.1\text{mA}, V_{CE}=10\text{V}$ $I_C=1.0\text{mA}, V_{CE}=10\text{V}$ $I_C=10\text{mA}, V_{CE}=10\text{V}$ $I_C=10\text{mA}, V_{CE}=10\text{V}, T_A=-55^\circ\text{C}$ $I_C=150\text{mA}, V_{CE}=10\text{V}^*$ $I_C=150\text{mA}, V_{CE}=1.0\text{V}^*$ $I_C=500\text{mA}, V_{CE}=10\text{V}^*$	35 50 75 35 100 50 40		300	
Collector-emitter saturation voltage*	$V_{CE(sat)}$	$I_C=150\text{mA}, I_B=15\text{mA}$ $I_C=500\text{mA}, I_B=50\text{mA}$			0.3 1.0	V V
Base-emitter saturation voltage*	$V_{BE(sat)}$	$I_C=150\text{mA}, I_B=15\text{mA}$ $I_C=500\text{mA}, I_B=50\text{mA}$	0.6		1.2 2.0	V V
SMALL SIGNAL CHARACTERISTICS						
Current gain-Bandwidth product	f_T	$I_C=20\text{mA}, V_{CE}=20\text{V}, f=100\text{MHz}$	300			MHz
Output capacitance	C_{obo}	$V_{CB}=10\text{V}, I_E=0, f=100\text{kHz}$			8.0	pF
Input capacitance	C_{ibo}	$V_{EB}=0.5\text{V}, I_C=0, f=100\text{kHz}$			25	pF
Collector base time constant	$r_b'C_c$	$I_C=20\text{mA}, V_{CB}=20\text{V}, f=31.8\text{MHz}$			150	pS
Noise figure	NF	$I_C=100\mu\text{A}, V_{CE}=10\text{V}, R_s=1.0\text{k}\Omega, f=1.0\text{kHz}$			4.0	dB
Real part of common-emitter high frequency input impedance	$Re(h_{ie})$	$I_C=20\text{mA}, V_{CB}=20\text{V}, f=300\text{MHz}$			60	Ω
SWITCHING CHARACTERISTICS						
Delay time	t_d	$V_{CC}=30\text{V}, V_{BE(OFF)}=0.5\text{V}, I_C=150\text{mA}, I_{B1}=15\text{mA}$			10	ns
Rise time	t_r				25	ns
Storage time	t_s	$V_{CC}=30\text{V}, I_C=150\text{mA}, I_{B1}=I_{B2}=15\text{mA}$			225	ns
Fall time	t_f				60	ns
THERMAL CHARACTERISTICS (TA=25°C, unless otherwise noted)						
Total Device Dissipation Derate above 25°C	P_D				625 5.0	mW mW/°C
Thermal resistance, junction to Case	$R_{\theta JC}$				83.3	°C/W
Thermal resistance, junction to Ambient	$R_{\theta JA}$				200	°C/W

*Pulse test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$

TEST CIRCUITS

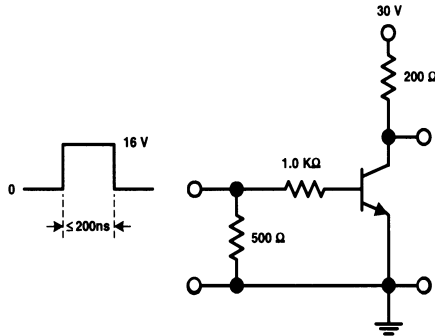


FIG.1 Saturated Turn-On Switching Time

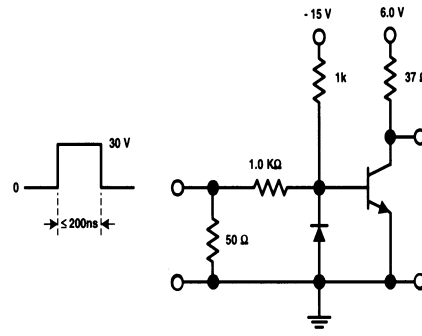
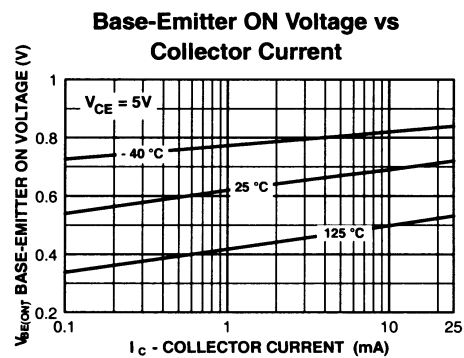
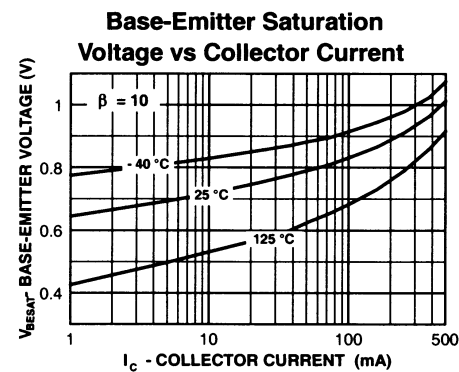
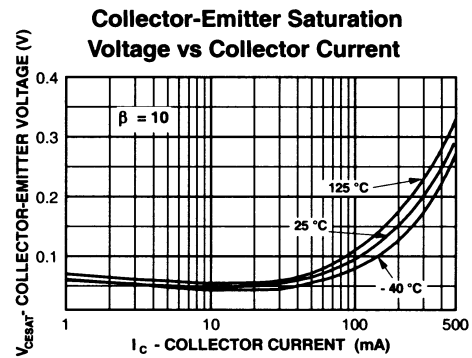
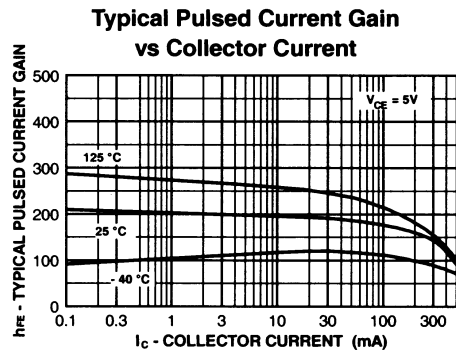


FIG.2 Saturated Turn-Off Switching Time

TYPICAL CHARACTERISTICS



UTC PN2222A NPN EPITAXIAL SILICON TRANSISTOR

