

## SEMICONDUCTOR TECHNICAL DATA

## KTN2222/A EPITAXIAL PLANAR NPN TRANSISTOR

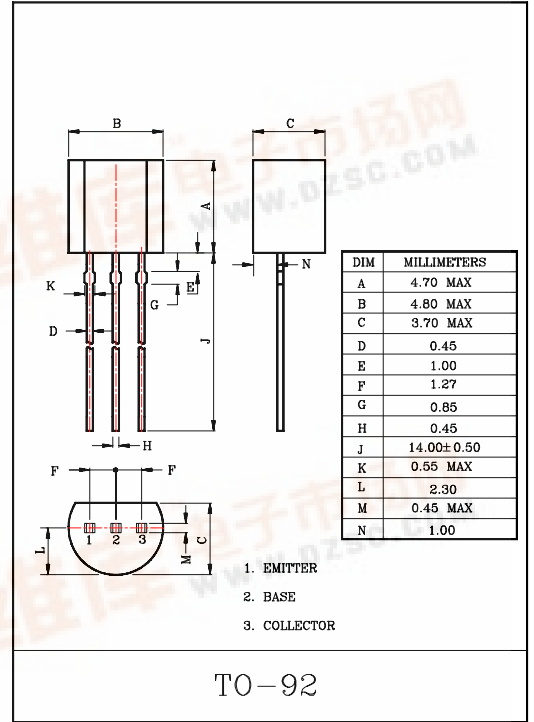
GENERAL PURPOSE APPLICATION,  
SWITCHING APPLICATION.

### FEATURES

- Low Leakage Current  
:  $I_{CEX}=10nA(\text{Max.})$ ;  $V_{CE}=60V$ ,  $V_{EB(\text{OFF})}=3V$ .
- Low Saturation Voltage  
:  $V_{CE(\text{sat})}=0.3V(\text{Max.})$ ;  $I_C=150mA$ ,  $I_B=15mA$ .
- Complementary to the KTN2907/2907A.
- KTN2222/2222A Electrically Similar to 2N2222/2222A.

### MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	RATING		UNIT
		KTN2222	KTN2222A	
Collector-Base Voltage	$V_{CBO}$	60	75	V
Collector-Emitter Voltage	$V_{CEO}$	30	40	V
Emitter-Base Voltage	$V_{EBO}$	5	6	V
Collector Current	$I_C$	600		mA
Collector Power Dissipation ( $T_a=25^\circ\text{C}$ )	$P_C$	625		mW
Junction Temperature	$T_j$	150		$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55~150		$^\circ\text{C}$



# KTN2222/A

## ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	KTN2222A	$I_{CEX}$	$V_{CE}=60V, V_{EB(OFF)}=3V$	-	-	10	nA
Collector Cut-off Current	KTN2222	$I_{CBO}$	$V_{CB}=50V, I_E=0$	-	-	0.01	$\mu A$
	KTN2222A		$V_{CB}=60V, I_E=0$	-	-	0.01	
Emitter Cut-off Current	KTN2222A	$I_{EBO}$	$V_{EB}=3V, I_C=0$	-	-	10	nA
Collector-Base Breakdown Voltage	KTN2222	$V_{(BR)CBO}$	$I_C=10\mu A, I_E=0$	60	-	-	V
	KTN2222A			75	-	-	
Collector-Emitter Breakdown Voltage *	KTN2222	$V_{(BR)CEO}$	$I_E=10mA, I_B=0$	30	-	-	V
	KTN2222A			40	-	-	
Emitter-Base Breakdown Voltage	KTN2222	$V_{(BR)EBO}$	$I_E=10\mu A, I_C=0$	5	-	-	V
	KTN2222A			6	-	-	
DC Current Gain *	KTN2222 KTN2222A	$h_{FE(1)}$	$I_C=0.1mA, V_{CE}=10V$	35	-	-	
		$h_{FE(2)}$	$I_C=1mA, V_{CE}=10V$	50	-	-	
		$h_{FE(3)}$	$I_C=10mA, V_{CE}=10V$	75	-	-	
		$h_{FE(4)}$	$I_C=150mA, V_{CE}=10V$	100	-	300	
	KTN2222	$h_{FE(5)}$	$I_C=500mA, V_{CE}=10V$	30	-	-	
	KTN2222A			40	-	-	
Collector-Emitter Saturation Voltage *	KTN2222	$V_{CE(sat)1}$	$I_C=150mA, I_B=15mA$	-	-	0.4	V
	KTN2222A			-	-	0.3	
	KTN2222	$V_{CE(sat)2}$	$I_C=500mA, I_B=50mA$	-	-	1.6	
	KTN2222A			-	-	1	
Base-Emitter Saturation Voltage *	KTN2222	$V_{BE(sat)1}$	$I_C=150mA, I_B=15mA$	-	-	1.3	V
	KTN2222A			0.6	-	1.2	
	KTN2222	$V_{BE(sat)2}$	$I_C=500mA, I_B=50mA$	-	-	2.6	
	KTN2222A			-	-	2.0	
Transition Frequency	KTN2222	$f_T$	$I_C=20mA, V_{CE}=20V, f=100MHz$	250	-	-	MHz
	KTN2222A			300	-	-	
Collector Output Capacitance		$C_{ob}$	$V_{CB}=10V, I_E=0, f=1.0MHz$	-	-	8	pF
Input Capacitance	KTN2222	$C_{ib}$	$V_{EB}=0.5V, I_C=0, f=1.0MHz$	-	-	30	pF
	KTN2222A			-	-	25	

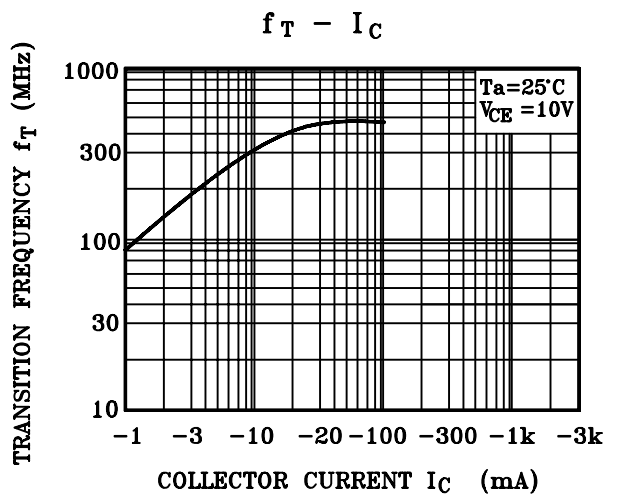
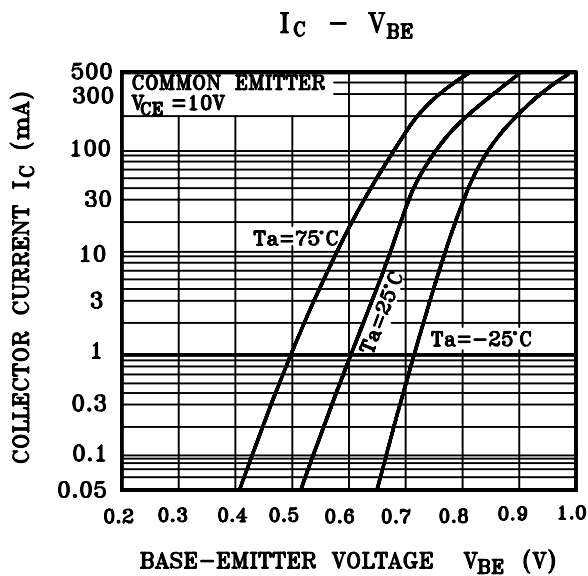
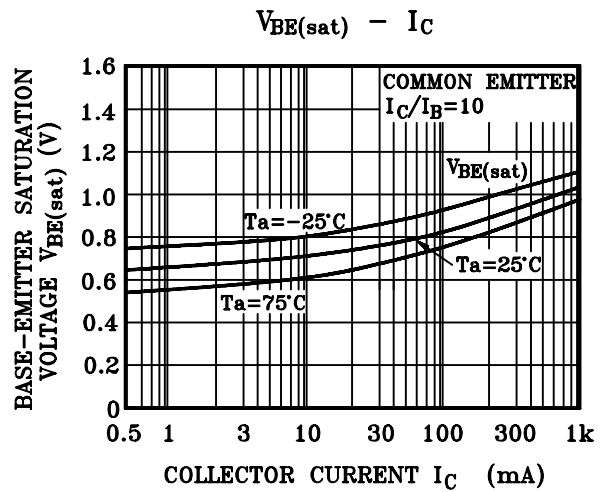
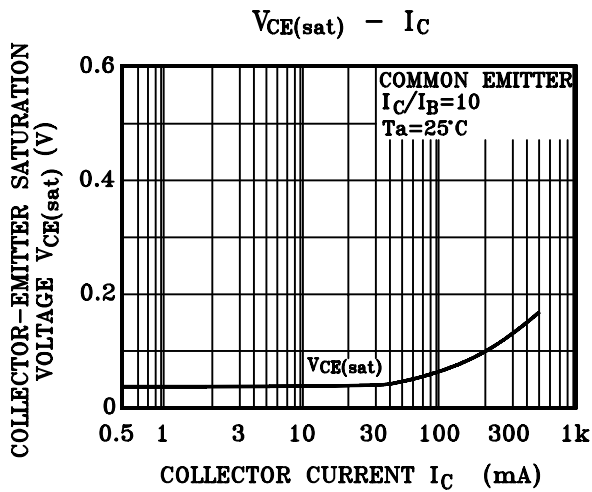
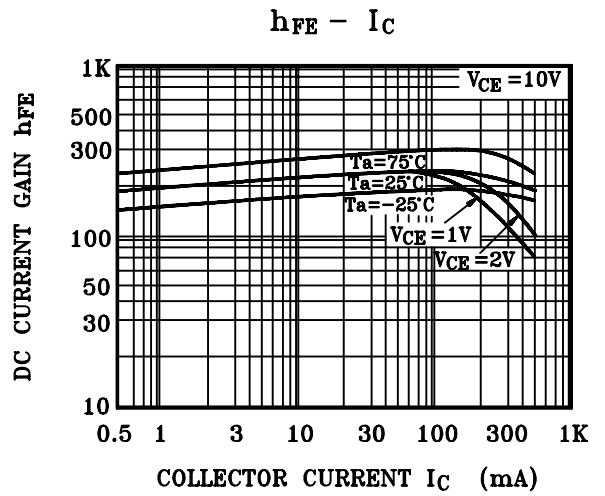
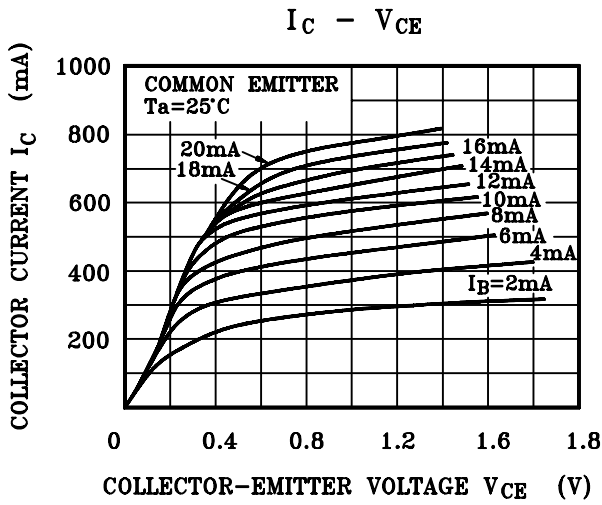
\*Pulse Test : Pulse Width  $\leq 300\mu S$ , Duty Cycle  $\leq 2.0\%$

# KTN2222/A

## ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Impedance	KTN2222A	$h_{ie}$	$I_C=1\text{mA}, V_{CE}=10\text{V}, f=1\text{kHz}$	2	-	8	k $\Omega$
			$I_C=10\text{mA}, V_{CE}=10\text{V}, f=1\text{kHz}$	0.25	-	1.25	
Voltage Feedback Ratio	KTN2222A	$h_{re}$	$I_C=1\text{mA}, V_{CE}=10\text{V}, f=1\text{kHz}$	-	-	8	$\times 10^{-4}$
			$I_C=10\text{mA}, V_{CE}=10\text{V}, f=1\text{kHz}$	-	-	4	
Small-Signal Current Gain	KTN2222A	$h_{fe}$	$I_C=1\text{mA}, V_{CE}=10\text{V}, f=1\text{kHz}$	50	-	300	
			$I_C=10\text{mA}, V_{CE}=10\text{V}, f=1\text{kHz}$	75	-	375	
Collector Output Admittance	KTN2222A	$h_{oe}$	$I_C=1\text{mA}, V_{CE}=10\text{V}, f=1\text{kHz}$	5	-	35	$\mu\text{S}$
			$I_C=10\text{mA}, V_{CE}=10\text{V}, f=1\text{kHz}$	25	-	200	
Collector-Base Time Constant	KTN2222A	$C_c \cdot r_{bb'}$	$I_E=20\text{mA}, V_{CB}=20\text{V}, f=31.8\text{MHz}$	-	-	150	pS
Noise Figure	KTN2222A	NF	$I_C=100\mu\text{A}, V_{CE}=10\text{V}, R_g=1\text{k}\Omega, f=1\text{kHz}$	-	-	4	dB
Switching Time	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	
	Storage Time	$t_{stg}$	$V_{CC}=30\text{V}, I_C=150\text{mA}$ $I_{B1}=-I_{B2}=15\text{mA}$	-	-	225	
	Fall Time	$t_f$		-	-	60	

# KTN2222/A



# KTN2222/A

