

Features

- Epitaxial Planar Die Construction
- Ultra-Small Surface Mount Package
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

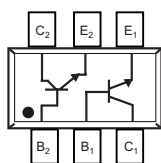
Maximum Ratings @ 25°C Unless Otherwise Specified

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 625°C/W Junction to Ambient

Parameter	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current	I_C	200	mA
Collector Power Dissipation ^(Note1)	P_C	200	mW

Note: 1. Valid provided that terminals are kept at ambient temperature.

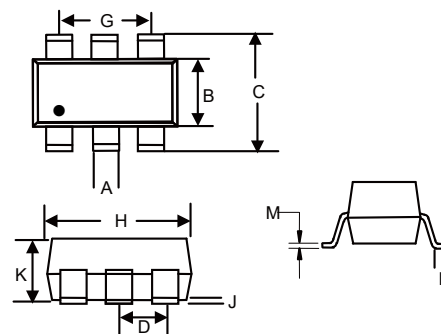
Internal Structure



Marking: K4A

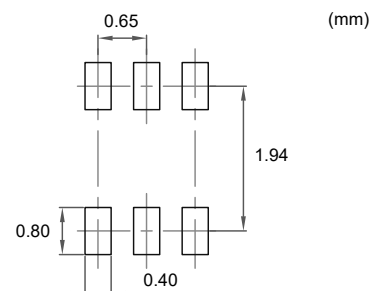
NPN Small Signal Transistors

SOT-363



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.006	0.014	0.15	0.35	
B	0.045	0.053	1.15	1.35	
C	0.079	0.096	2.00	2.45	
D	0.026		0.65		TYP.
G	0.047	0.055	1.20	1.40	
H	0.071	0.087	1.80	2.20	
J	-----	0.004	-----	0.10	
K	0.031	0.043	0.80	1.10	
L	0.010	0.018	0.26	0.46	
M	0.003	0.006	0.08	0.15	

Suggested Solder Pad Layout



Electrical Characteristics @ 25°C Unless Otherwise Specified

Parameter	Symbol	Min	Typ	Max	Units	Conditions
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	60			V	$I_C=10\mu A, I_E=0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	40			V	$I_C=1mA, I_B=0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5			V	$I_E=10\mu A, I_C=0$
Base Cutoff Current	I_{BL}			50	nA	$V_{CE}=30V, V_{EB(OFF)}=3V$
Collector Cutoff Current	I_{CEX}			50	nA	$V_{CE}=30V, V_{EB(OFF)}=3V$
DC Current Gain ^(Note2)	$h_{FE(1)}$	40				$V_{CE}=1V, I_C=0.1mA$
	$h_{FE(2)}$	70				$V_{CE}=1V, I_C=1mA$
	$h_{FE(3)}$	100		300		$V_{CE}=1V, I_C=10mA$
	$h_{FE(4)}$	60				$V_{CE}=1V, I_C=50mA$
	$h_{FE(5)}$	30				$V_{CE}=1V, I_C=100mA$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			0.2	V	$I_C=10mA, I_B=1mA$
				0.3	V	$I_C=50mA, I_B=5mA$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	0.65		0.85	V	$I_C=10mA, I_B=1mA$
				0.95	V	$I_C=50mA, I_B=5mA$
Transition Frequency	f_T	300			MHz	$V_{CE}=20V, I_C=10mA, f=100MHz$
Output Capacitance	C_{obo}			4.0	pF	$V_{CB}=5V, I_E=0, f=1MHz$
Delay Time	t_d			35	ns	$V_{CC}=3V, I_C=10mA$
Rise Time	t_r			35	ns	$V_{BE(OFF)}=-0.5V, I_{B1}=1mA$
Storage Time	t_s			200	ns	$V_{CC}=3V, I_C=10mA$
Fall Time	t_f			50	ns	$I_{B1}=I_{B2}=1mA$

Note: 2. Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2.0\%$

Curve Characteristics

Fig. 1 - Static Characteristics

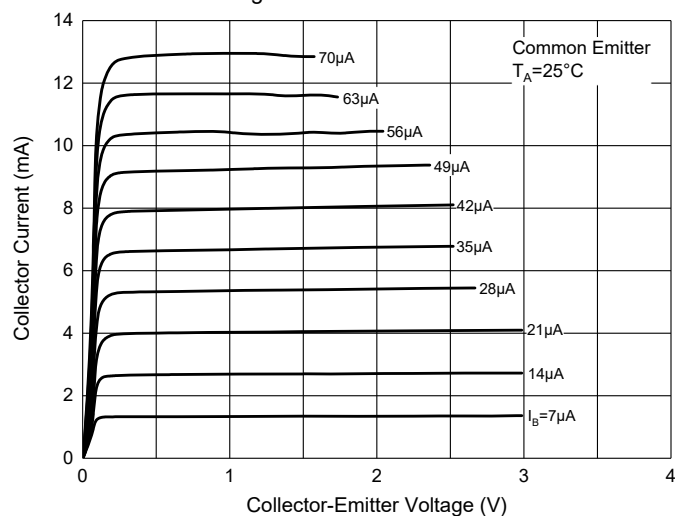


Fig. 2 - DC Current Gain Characteristics

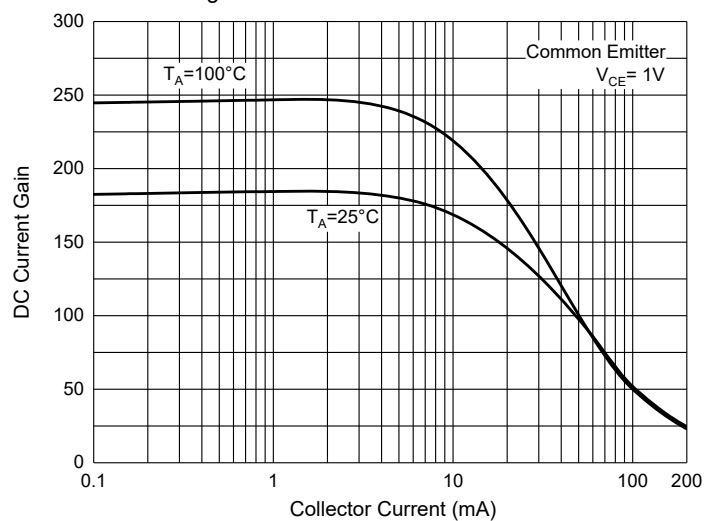


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

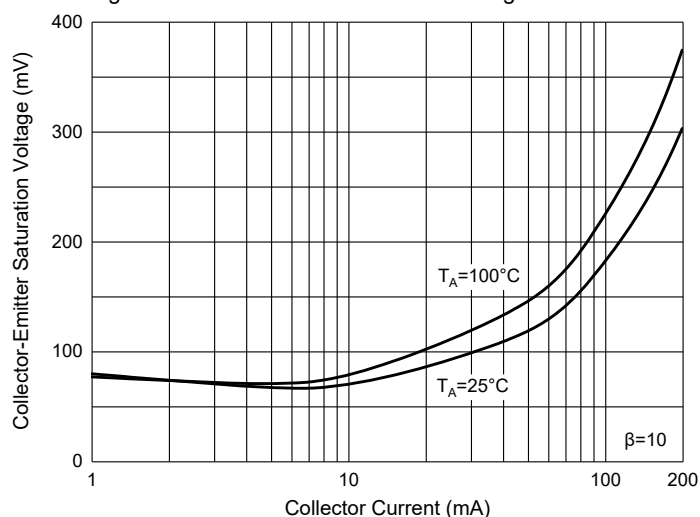


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

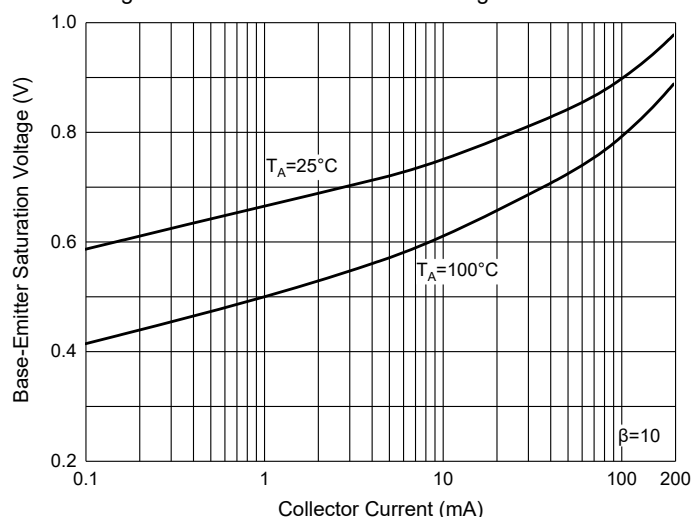


Fig. 5 - Base-Emitter Voltage Characteristics

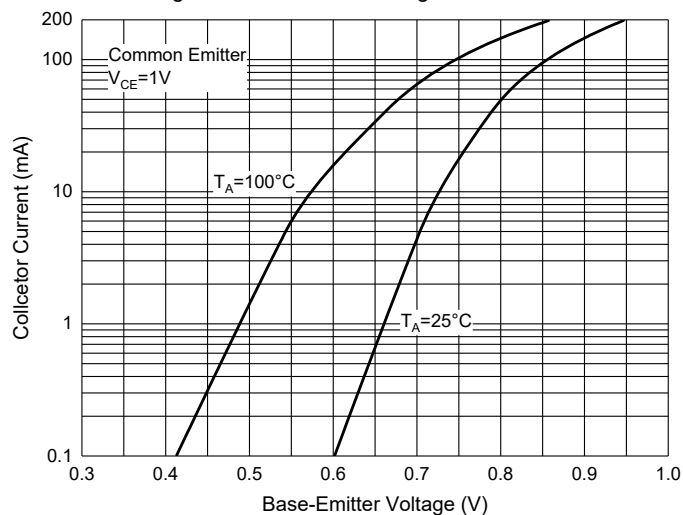
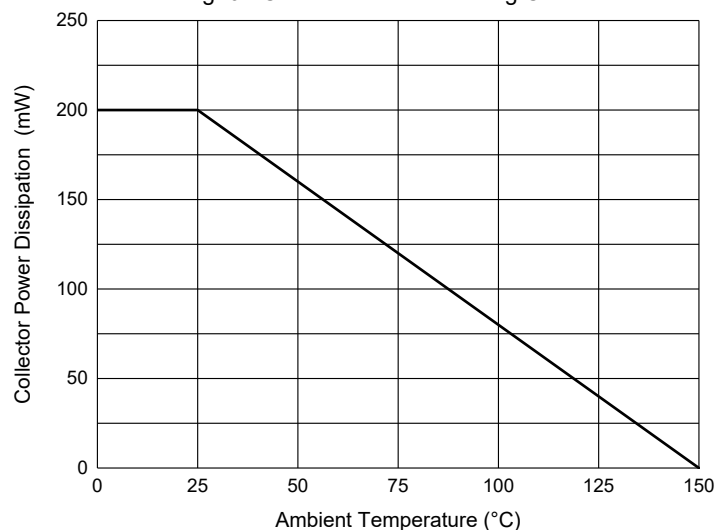


Fig. 6 - Collector Power Derating Curve



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 3Kpcs/Reel

Note : Adding "-HF" Suffix For Halogen Free, eg. Part Number-TP-HF

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