2SA1012 TRANSISTOR (PNP)

TO-220C

1.BASE
2.COLLECTOR
3.EMITTER

FEATURES

- High Current Switching Applications
- Low Collector Saturation Voltage
- High Speed Swithing Time

MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	-60	V
V_{CEO}	Collector-Emitter Voltage	-50	V
V_{EBO}	Emitter-Base Voltage	-5	V
I_C	Collector Current -Continuous	-5	A
P_C	Collector Power Dissipation	2	W
$R_{\theta JA}$	ThermaltoAmbientResistance	62.5	℃/W
T_J,T_{stg}	Operation Junction and Storage Temperature Range	-55~+150	℃

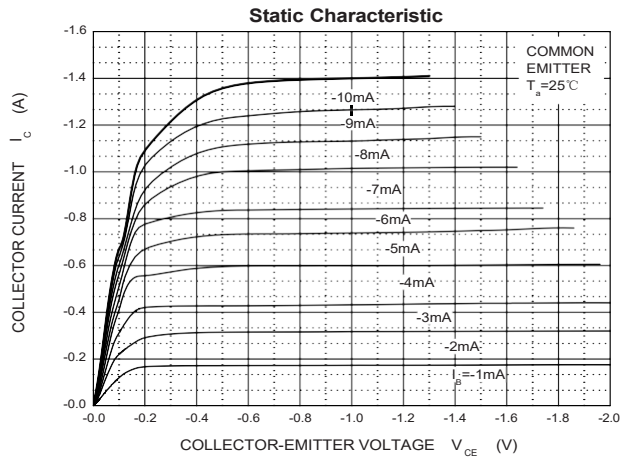
ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise specified)

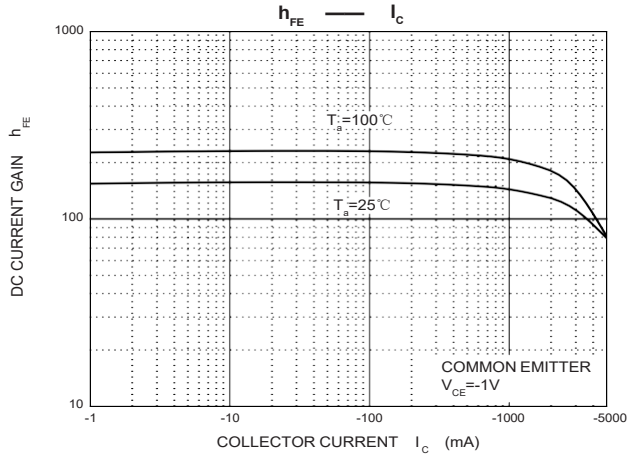
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C =-0.1mA, I_E=0	-60			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$*	I_C =-10mA, I_B=0	-50			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E=-100μA, I_C=0	-5			V
Collector cut-off current	I_{CBO}	V_{CB}=-50V, I_E=0			-1	μA
Emitter cut-off current	I_{EBO}	V_{EB}=-5V, I_C=0			-1	μA
DC current gain	$h_{FE(1)}$	V_{CE}=-1V, I_C=-1A	70		240	
	$h_{FE(2)}$*	V_{CE}=-1V, I_C=-3A	30			
Collector-emitter saturation voltage	$V_{CE(sat)}$*	I_C=-3A, I_B=-150mA			-0.4	V
Base-emitter saturation voltage	$V_{BE(sat)}$*	I_C=-3A, I_B=-150mA			-1.2	V
Transition frequency	f_T	V_{CE}=-4V, I_C=-1A		60		MHz
Collector output capacitance	C_{ob}	V_{CB}=-10V, I_E=0, f=1MHz		170		pF
Turn-on Time	t_{on}	V_{CC}=-30V,I_C=-3A, I_{B1}=-I_{B2}=-0.15A		0.1		μs
Storage Time	t_s			1.0		
Fall Time	t_f			0.1		

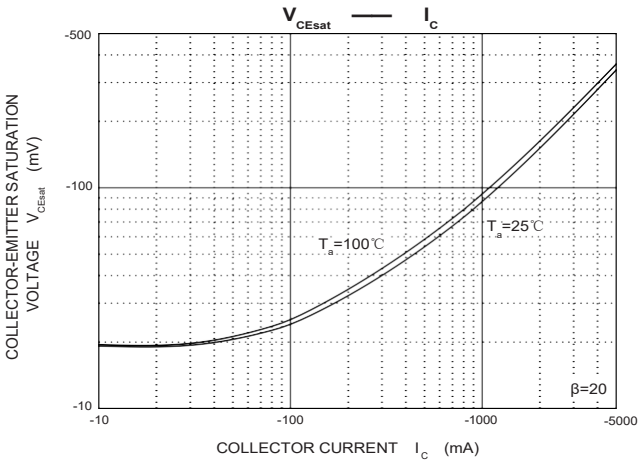
*Pulse test: t_p≤300μs, δ≤0.02.

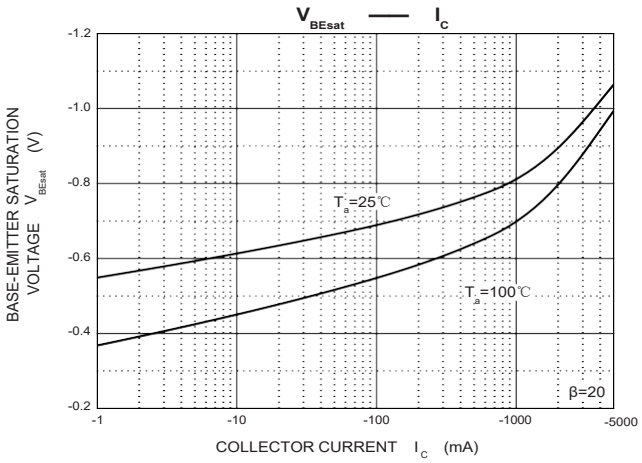
CLASSIFICATION of $h_{FE(1)}$

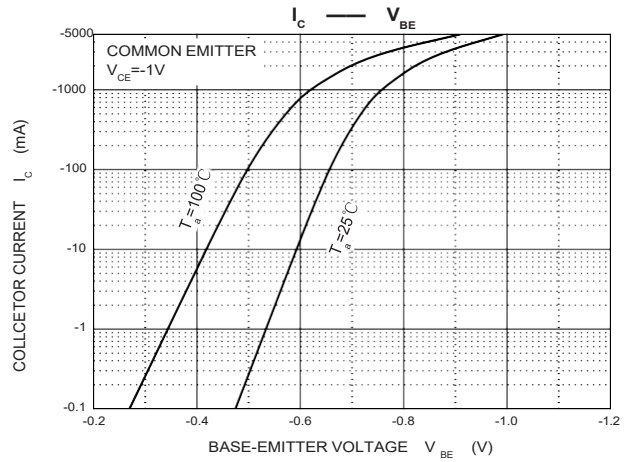
Rank	O	Y
Range	70-140	120-240

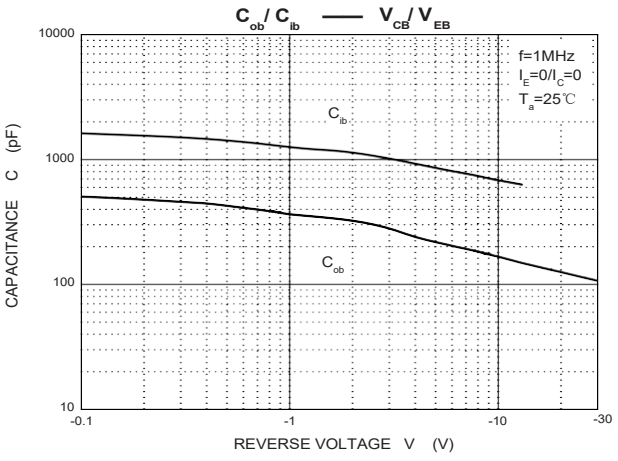

Static Characteristic
COMMON EMITTER
T_a=25℃
-10mA
-9mA
-8mA
-7mA
-6mA
-5mA
-4mA
-3mA
-2mA
I_B=-1mA
COLLECTOR CURRENT I_C (A)
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)

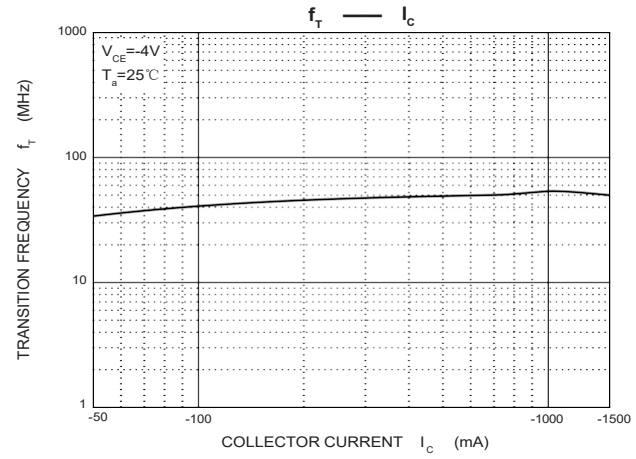

h_{FE} — I_C
T_a=100℃
T_a=25℃
COMMON EMITTER
V_{CE}=-1V
DC CURRENT GAIN h_{FE}
COLLECTOR CURRENT I_C (mA)

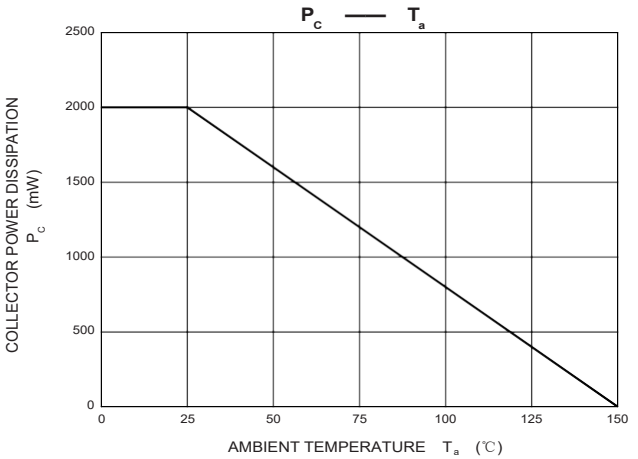

V_{CEsat} — I_C
T_a=100℃
T_a=25℃
β=20
COLLECTOR-EMITTER SATURATION VOLTAGE V_{CEsat} (mV)
COLLECTOR CURRENT I_C (mA)


V_{BEsat} — I_C
T_a=25℃
T_a=100℃
β=20
BASE-EMITTER SATURATION VOLTAGE V_{BEsat} (V)
COLLECTOR CURRENT I_C (mA)


I_C — V_{BE}
COMMON EMITTER
V_{CE}=-1V
T_a=100℃
T_a=25℃
COLLCETOR CURRENT I_C (mA)
BASE-EMITTER VOLTAGE V_{BE} (V)


C_{ob} / C_{ib} — V_{CB} / V_{EB}
f=1MHz
I_E=0/I_C=0
T_a=25℃
C_{ib}
C_{ob}
CAPACITANCE C (pF)
REVERSE VOLTAGE V (V)


f_T — I_C
V_{CE}=-4V
T_a=25℃
TRANSITION FREQUENCY f_T (MHz)
COLLECTOR CURRENT I_C (mA)


P_C — T_a
COLLECTOR POWER DISSIPATION P_C (mW)
AMBIENT TEMPERATURE T_a (℃)