Ordering number:ENN2826

NPN Triple Diffused Planar Silicon Composite Transistor

HPA100R

Ultrahigh-Definition CRT Display Horizontal Deflection Output Applications

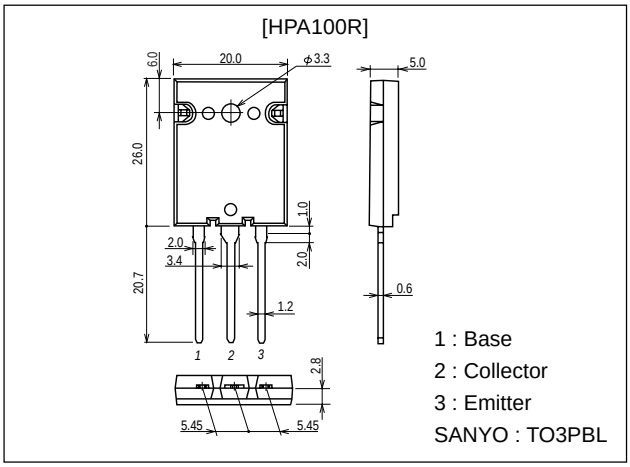
Features

- High speed (t_f typ=100ns).
- High breakdown voltage (V_{CBO}=1500V).
- High-speed damper diode placed in one package (t_{fr}=0.2μs max).
- Adoption of MBIT process.
- High reliability (adoption of HVP process).

Package Dimensions

unit:mm

2048B



Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		1500	V
Collector-to-Emitter Voltage	V_{CEO}		800	V
Emitter-to-Base Voltage	V_{EBO}		6	V
Collector Current	I_C		10	A
Collector Current (Pulse)	I_{CP}		25	A
Diode Forward Current	I_O		6	A
Diode Forward Current (Pulse)	I_{OP}	PW≤100μs, duty≤50%	10	A
Total Power Dissipation	P_T	Tc=25°C	150	W
Junction Temperature	Tj		150	˚C
Storage Temperature	Tstg		–55 to +150	˚C

Electrical Characteristics at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=1500V, I_E=0			5	mA
Collector Sustain Voltage	$V_{CEO(sus)}$	I_C=100mA, I_B=0	800			V
Emitter Cutoff Current	I_{EBO}	V_{EB}=4V, I_C=0			1.0	mA
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=6A, I_B=1.5A			5	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=6A, I_B=1.5A			1.5	V

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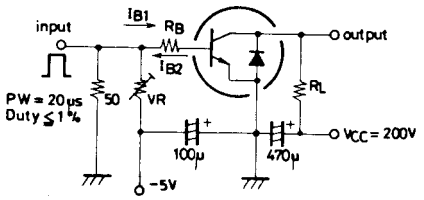
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	$h_{FE}(1)$	V_{CE}=5V, I_C=1.0A	8			
	$h_{FE}(2)$	V_{CE}=5V, I_C=6.0A	4*		10*	
Storage Time	t_{stg}	I_C=6A, I_{B1}=1.2A, I_{B2}=–2.4A			3.0	μs
Fall Time	t_f	I_C=6A, I_{B1}=1.2A, I_{B2}=–2.4A		0.1	0.2	μs
Diode Forward Voltage	$V_F(1)$	I_F=6A			3	V
	$V_F(2)$	I_F=10A			5	V
Diode Reverse Recovery Time	t_{rr}	I_F=–I_R=100mA			1	μs
Diode Forward Recovery Time	t_{fr}	I_F=100mA		0.1	0.2	μs

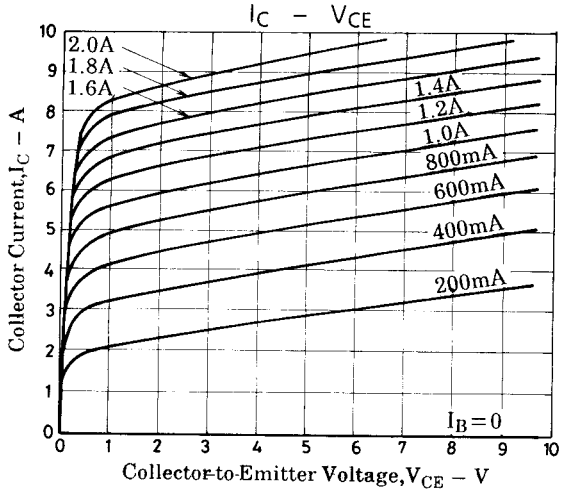
* The HPA100R is classified by 6A h_{FE} as follows :

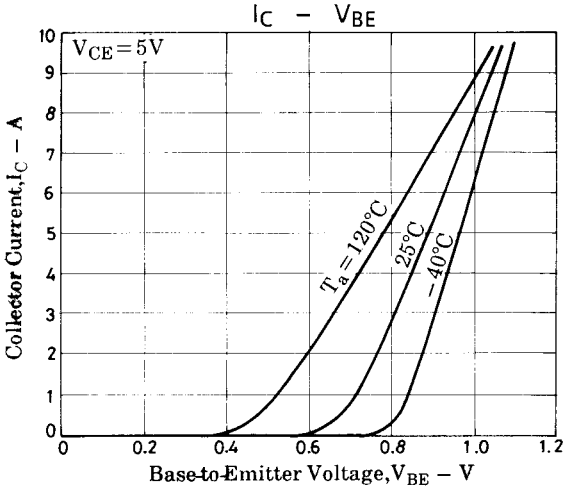
h_{FE}	4 to 6	5 to 8	7 to 10
Rank	2	3	4

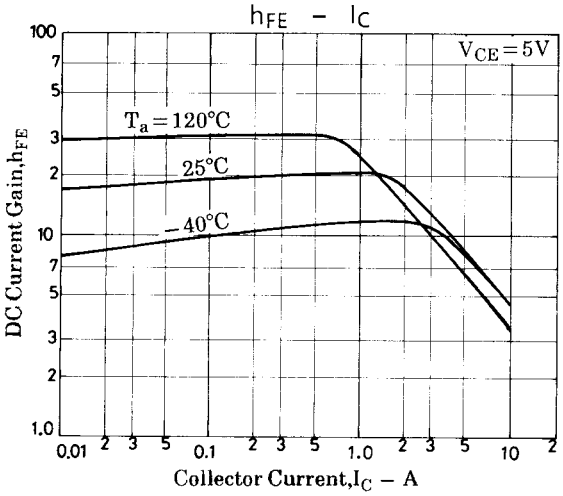
Switching Time Test Circuit

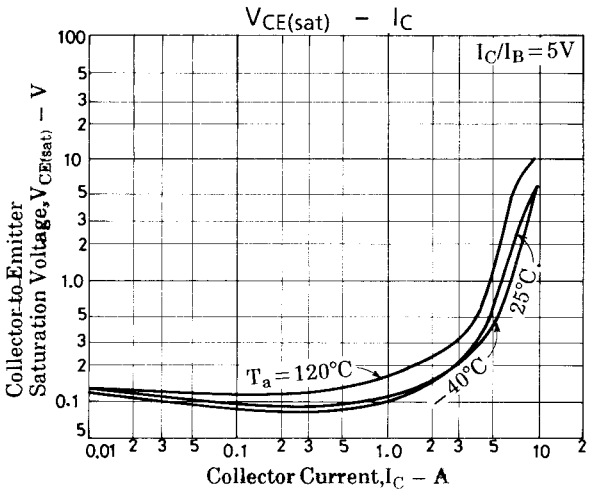


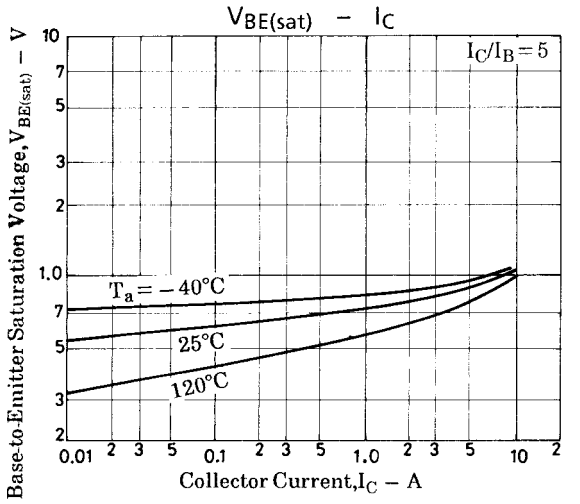
Unit (resistance:Ω, capacitance:F)

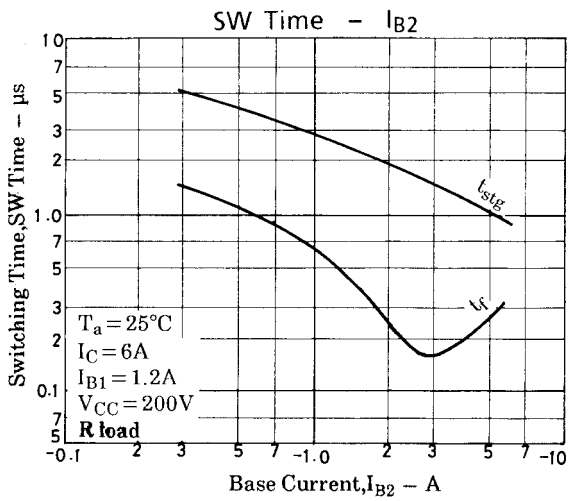


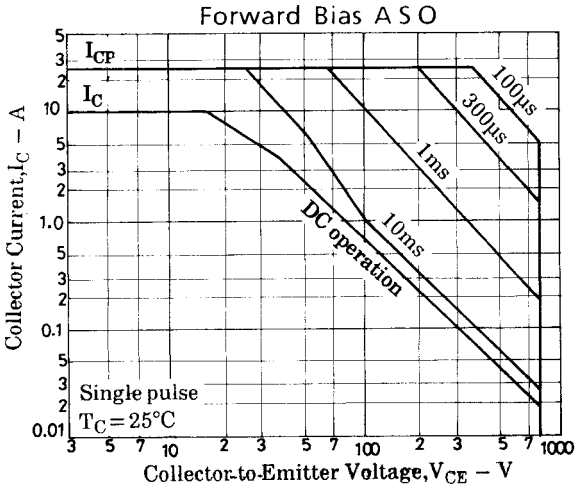


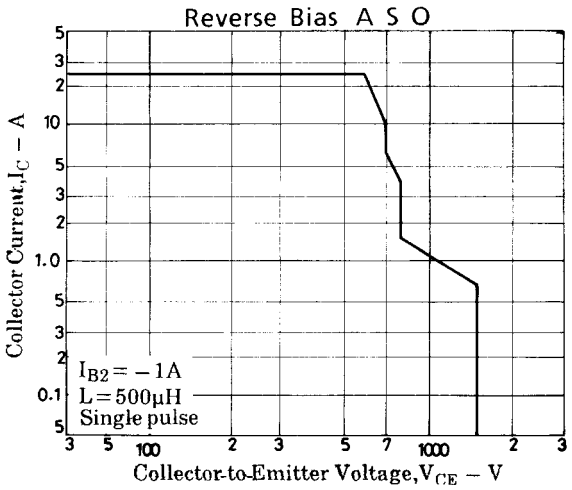


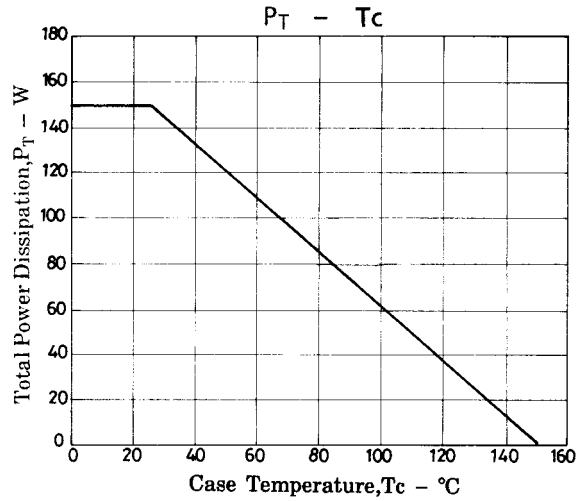


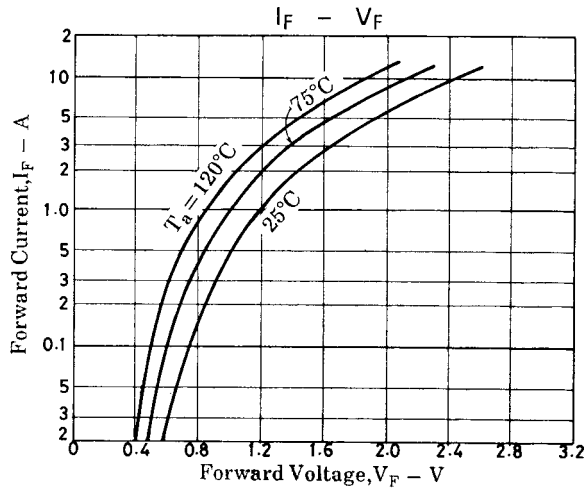

$V_{BE(sat)}$ – I_C
$I_C/I_B = 5$
$T_a = -40°C$
25°C
120°C
Base-to-Emitter Saturation Voltage, $V_{BE(sat)}$ – V
Collector Current, I_C – A


SW Time – I_{B2}
t_{stg}
t_f
$T_a = 25°C$
$I_C = 6A$
$I_{B1} = 1.2A$
$V_{CC} = 200V$
R load
Switching Time, SW Time – µs
Base Current, I_{B2} – A


Forward Bias A S O
I_{CP}
I_C
100µs
300µs
1ms
10ms
DC operation
Single pulse
$T_C = 25°C$
Collector Current, I_C – A
Collector-to-Emitter Voltage, V_{CE} – V


Reverse Bias A S O
$I_{B2} = -1A$
$L = 500µH$
Single pulse
Collector Current, I_C – A
Collector-to-Emitter Voltage, V_{CE} – V


P_T – Tc
Total Power Dissipation, P_T – W
Case Temperature, Tc – °C


I_F – V_F
75°C
$T_a = 120°C$
25°C
Forward Current, I_F – A
Forward Voltage, V_F – V