Ordering number:ENN2827

NPN Triple Diffused Planar Silicon Composite Transistor

HPA150R

Ultrahigh-Definition CRT Display Horizontal Deflection Output Applications

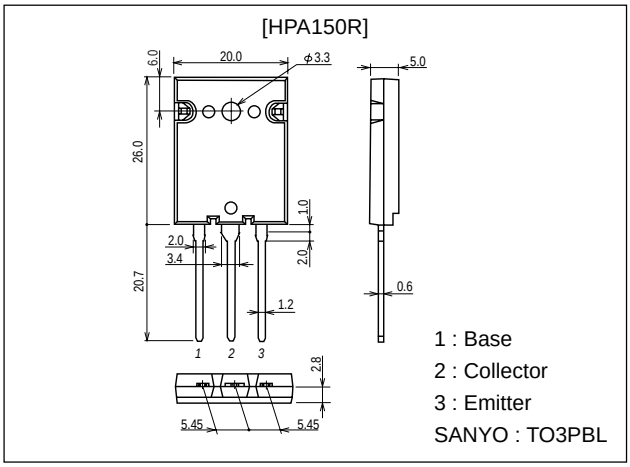
Features

- 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		15	A
Collector Current (Pulse)	I_{CP}		35	A
Diode Forward Current	I_O		10	A
Diode Forward Current (Pulse)	I_{OP}	PW≤100μs, duty≤50%	15	A
Total Power Dissipation	P_T	Tc=25°C	180	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=10A, I_B=2.5A			5	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=10A, I_B=2.5A			1.5	V

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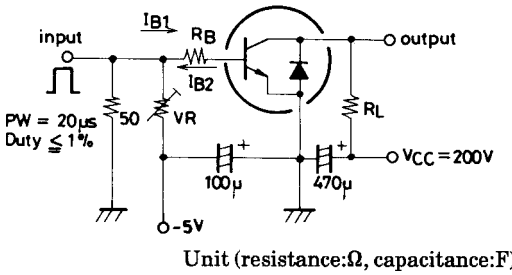
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	$h_{FE}(1)$	V_{CE}=5V, I_C=1.0A	8			
	$h_{FE}(2)$	V_{CE}=5V, I_C=10A	4*		10*	
Storage Time	t_{stg}	I_C=8A, I_{B1}=1.6A, I_{B2}=–3.2A			3.0	μs
Fall Time	t_f	I_C=8A, I_{B1}=1.6A, I_{B2}=–3.2A		0.1	0.2	μs
Diode Forward Voltage	$V_F(1)$	I_F=10A			3	V
	$V_F(2)$	I_F=15A			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

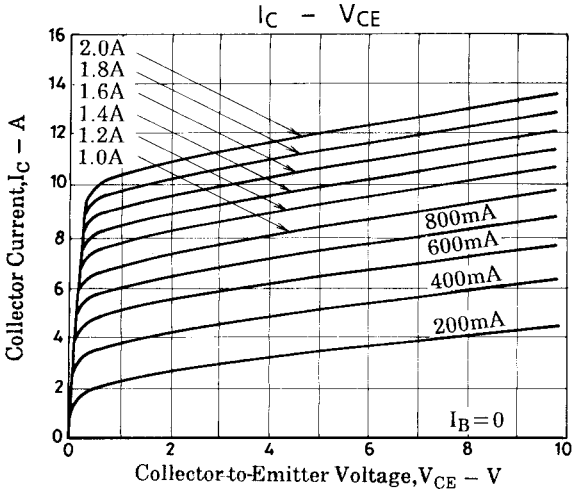
* The HPA150R is classified by 10A h_{FE} as follows :

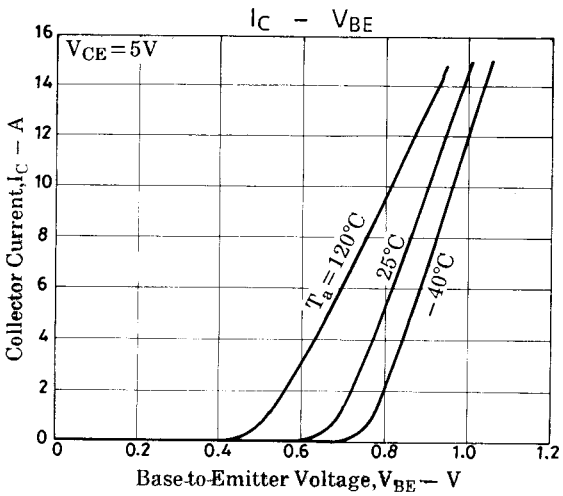
h_{FE}	4 to 6	5 to 8	7 to 10
Rank	2	3	4

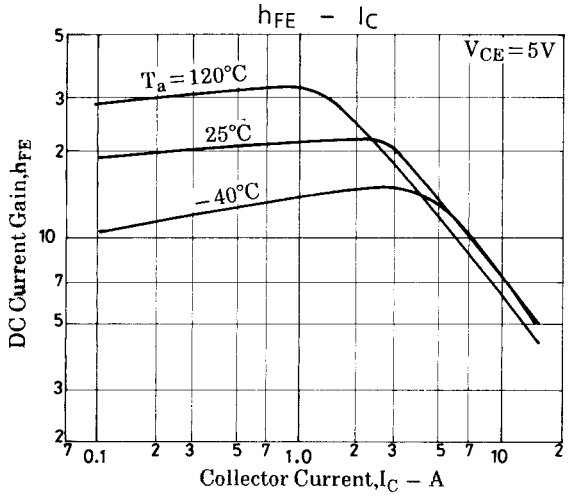
Switching Time Test Circuit

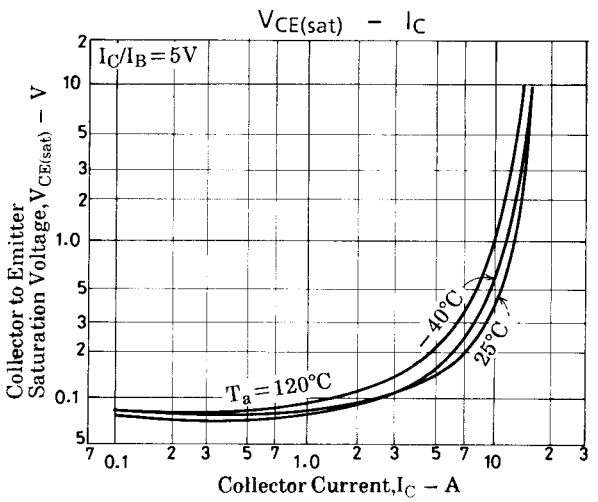


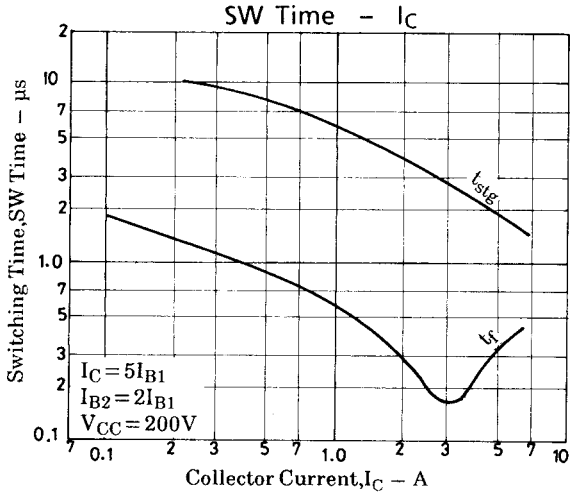
Unit (resistance:Ω, capacitance:F)

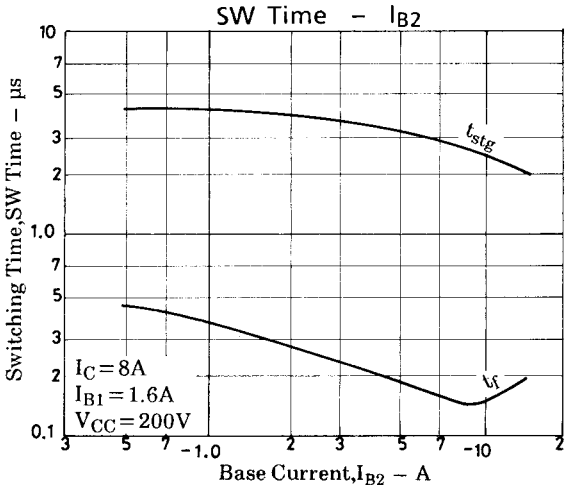


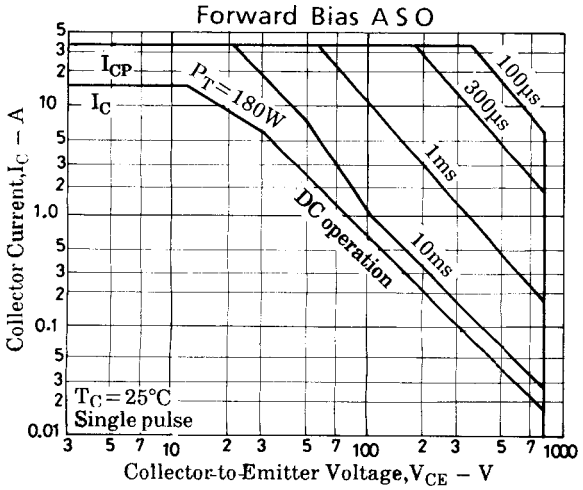


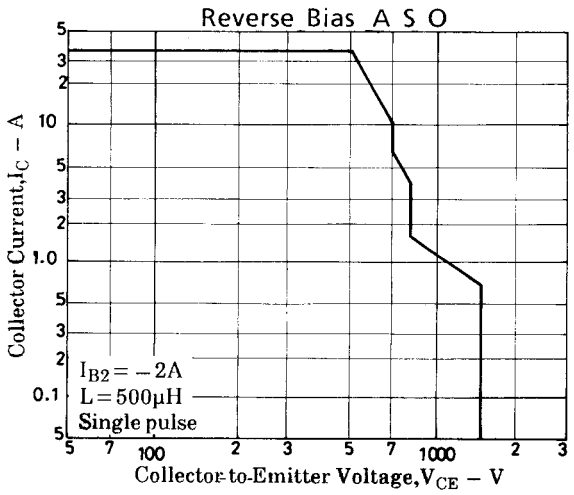


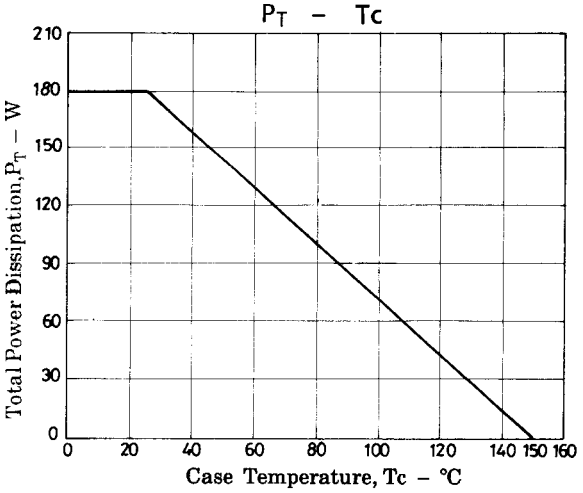


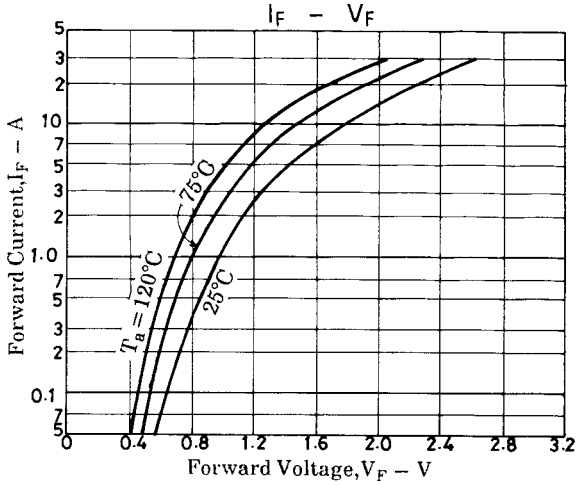

SW Time – I_C
Switching Time,SW Time – μs
t_{stg}
t_f
$I_C = 5I_{B1}$
$I_{B2} = 2I_{B1}$
$V_{CC} = 200V$
Collector Current,I_C – A


SW Time – I_{B2}
Switching Time,SW Time – μs
t_{stg}
t_f
$I_C = 8A$
$I_{B1} = 1.6A$
$V_{CC} = 200V$
Base Current,I_{B2} – A


Forward Bias A S O
I_{CP}
I_C
$P_T = 180W$
100μs
300μs
1ms
DC operation
10ms
$T_C = 25°C$
Single pulse
Collector Current,I_C – A
Collector-to-Emitter Voltage,V_{CE} – V


Reverse Bias A S O
$I_{B2} = -2A$
$L = 500\mu H$
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