

No.751C

2SD1111

NPN Epitaxial Planar Silicon Darlington Transistor

Driver Applications

Applications

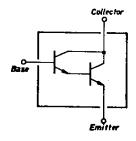
. Motor drivers, printer hammer drivers, relay drivers, voltage regulator control

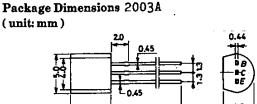
Features

- . High DC current gain (5000 or greater).
- . Large current capacity and wide ASO.
- . Low saturation voltage ($V_{CE(sat)}=0.8V$ typ).

Collector to Base Voltage VCBO $0.00000000000000000000000000000000000$	Absolute Maximum Ratings at Ta=25°C					υ	ınit
Emitter to Base Voltage VEBO 10 V Emitter to Base Voltage VCEO VEBO 10 V Collector Current IC 0.7 A Collector Dissipation PC 600 mW Junction Temperature Tj 150 °C Storage Temperature Tstg -55 to +150 °C Electrical Characteristics at Ta=25°C min typ max unit Collector Cutoff Current ICBO VCB=40V, IE=0 0.1 μ A Emitter Cutoff Current ICBO VCB=8V, IC=0 0.1 μ A Emitter Cutoff Current ICBO VCB=8V, IC=0 0.1 μ A Current Gain hFE(1) VCE=2V, IC=50mA 5000 hFE(2) VCE=2V, IC=50mA 4000 Gain-Bandwidth Product fT VCE=5V, IC=50mA 4000 Gain-Bandwidth Product fT VCE=5V, IC=50mA 200 MHz Output Capacitance cob VCB=10V, f=1MHz 10 pF C-E Saturation Voltage VCE(sat) IC=100mA, IB=0.1mA 0.8 1.2 V B-E Saturation Voltage VBE(sat) IC=100mA, IB=0.1mA 0.8 1.2 V C-B Breakdown Voltage VCB(Sat) IC=100mA, IB=0.1mA 1.3 2.0 V C-E Breakdown Voltage VCBR) CBO IC=1mA, RBE=00 50 V					8	0	V
Collector Current I_{C} 0.7 A Collector Current(Pulse) I_{CP} 2 A Collector Dissipation P_{C} 600 mW Junction Temperature T_{J} 150 °C Storage Temperature T_{J} 150 °C Storage Temperature I_{CBO} $V_{CB}=40$ V, $I_{E}=0$ 0.1 μ A Emitter Cutoff Current I_{EBO} $V_{CE}=8$ V, $I_{C}=0$ 0.1 μ A DC Current Gain I_{EE}	Collector to Emitter Voltage VOEO				5	0	V
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Emitter to Base Voltage	_ AGE	0		1	0	V
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Collector Current		.0		0.	7	A
Collector Dissipation Junction Temperature Tj 150 °C Storage Temperature Tstg 150 °C Storage Temperature Tstg 150 °C -55 to $+150$ °C -55 to -150 °C	. Collector Current(Pulse)					2	A
Junction Temperature Tj 150 $^{\circ}C$ Storage Temperature $Tstg$ -55 to $+150$ $^{\circ}C$ $^$	Collector Dissipation	Pc			60	0	mW
Storage Temperature Tstg -55 to +150 °C Electrical Characteristics at Ta=25°C		Тj			15	0	ОС
Collector Cutoff Current I_{CBO} $V_{CB}=40V, I_{E}=0$ 0.1 μ A Emitter Cutoff Current I_{EBO} $V_{EB}=8V, I_{C}=0$ 0.1 μ A DC Current Gain $h_{FE}(1)$ $V_{CE}=2V, I_{C}=50m$ A 5000 $h_{FE}(2)$ $V_{CE}=2V, I_{C}=50m$ A 4000 Gain-Bandwidth Product f_T $V_{CE}=5V, I_{C}=50m$ A 200 MHz Output Capacitance c_{ob} $V_{CB}=10V, f=1$ MHz 10 pF C-E Saturation Voltage $v_{CE}(sat)$			g .	-55 t	0 +15	0	O _C
Emitter Cutoff Current I_{EBO} $V_{EB}=8V,I_{C}=0$ 0.1 μA DC Current Gain $h_{FE}(1)$ $V_{CE}=2V,I_{C}=50mA$ 5000 $h_{FE}(2)$ $V_{CE}=2V,I_{C}=50mA$ 4000 Gain-Bandwidth Product f_{T} $V_{CE}=5V,I_{C}=50mA$ 200 MHz Output Capacitance c_{Ob} $V_{CB}=10V,f=1MHz$ 10 pF C-E Saturation Voltage $V_{CE}(sat)$ $I_{C}=100mA,I_{B}=0.1mA$ 0.8 1.2 V B-E Saturation Voltage $V_{BE}(sat)$ $I_{C}=100mA,I_{B}=0.1mA$ 1.3 2.0 V C-B Breakdown Voltage $V_{CB}(sat)$ $I_{C}=10\mu A,I_{CD}(sat)$ I	Electrical Characteristics	at Ta=25	o _C	min	typ	max	unit
Emitter Cutoff Current IEBO $V_{EB}=8V,I_{C}=0$ 0.1 μA DC Current Gain $h_{FE}(1)$ $V_{CE}=2V,I_{C}=50mA$ 5000 $h_{FE}(2)$ $V_{CE}=2V,I_{C}=500mA$ 4000 Gain-Bandwidth Product f_{T} $V_{CE}=5V,I_{C}=50mA$ 200 MHz Output Capacitance c_{ob} $V_{CB}=10V,f=1MHz$ 10 pF C-E Saturation Voltage $V_{CE}(sat)$ $I_{C}=100mA,I_{B}=0.1mA$ 0.8 1.2 V B-E Saturation Voltage $V_{CB}(sat)$ $I_{C}=100mA,I_{B}=0.1mA$ 1.3 2.0 V C-B Breakdown Voltage $V_{CB}(sat)$ $I_{C}=10\mu A,I_{C}=0$ 80 V C-E Breakdown Voltage $V_{CB}(sat)$ $I_{C}=10\mu A,I_{C}=0$ 80 V $V_{CB}(sat)$ $V_{CE}(sat)$ $V_{$	Collector Cutoff Current	ICPO	Vcp=40V.Ip=0			0.1	μA
DC Current Gain $h_{FE}(1)$ $V_{CE}=2V,I_{C}=50mA$ 5000 $h_{FE}(2)$ $V_{CE}=2V,I_{C}=500mA$ 4000 Gain-Bandwidth Product f_{T} $V_{CE}=5V,I_{C}=50mA$ 200 MHz Output Capacitance c_{ob} $V_{CB}=10V,f=1MHz$ 10 pF C-E Saturation Voltage $V_{CE}(sat)$ $I_{C}=100mA,I_{B}=0.1mA$ 0.8 1.2 V BE(sat) $I_{C}=100mA,I_{B}=0.1mA$ 1.3 2.0 V C-B Breakdown Voltage $V_{CB}(sat)$ $I_{C}=10\mu A,I_{CE}(sat)$ 80 V C-E Breakdown Voltage $V_{CB}(sat)$ $V_{CE}(sat)$ V	Emitter Cutoff Current	IEBO				0.1	μΑ
Gain-Bandwidth Product f_T $V_{CE}=2V,I_C=500mA$ 4000 MHz Output Capacitance c_{ob} $V_{CB}=10V,f=1MHz$ 10 pF C-E Saturation Voltage $V_{CE}(sat)$ $I_C=100mA,I_B=0.1mA$ 0.8 1.2 V BE(sat) $I_C=100mA,I_B=0.1mA$ 1.3 2.0 V C-B Breakdown Voltage $V_{CB}(sat)$ $I_C=100mA,I_B=0.1mA$ 1.3 2.0 V C-E Breakdown Voltage $V_{CB}(sat)$ $I_C=100mA,I_C=0$ 80 V C-E Breakdown Voltage $V_{CB}(sat)$ $I_C=100mA,I_C=0$ 80 V $V_{CB}(sat)$	DC Current Gain	$h_{\rm FF}^{\rm ED}(1)$		5000			
Gain-Bandwidth Product f_T $V_{CE}=5V,I_C=50mA$ 200 MHz Output Capacitance c_{ob} $V_{CB}=10V,f=1MHz$ 10 pF C-E Saturation Voltage $V_{CE(sat)}$ $I_C=100mA,I_B=0.1mA$ 0.8 1.2 V B-E Saturation Voltage $V_{BE(sat)}$ $I_C=100mA,I_B=0.1mA$ 1.3 2.0 V C-B Breakdown Voltage $V_{(BR)CBO}$ $I_{C}=10\mu A,I_{E}=0$ 80 V C-E Breakdown Voltage $V_{(BR)CEO}$ $I_{C}=1mA,R_{BE}=\infty$ 50 V		$h_{rr}^{rr}(2)$		4000			
Output Capacitance cob VCB=10V, \tilde{f} =1MHz 10 pF C-E Saturation Voltage VCE(sat) I_C =100mA, I_B =0.1mA 0.8 1.2 V B-E Saturation Voltage VBE(sat) I_C =100mA, I_B =0.1mA 1.3 2.0 V C-B Breakdown Voltage V(BR)CBO I_C =10 μ A, I_E =0 80 V C-E Breakdown Voltage V(BR)CEO I_C =1mA, I_C =0 50 V	Gain-Bandwidth Product				200		MHz
C-E Saturation Voltage $V_{CE(sat)}$ $I_{C}=100mA$, $I_{B}=0.1mA$ 0.8 1.2 V B-E Saturation Voltage $V_{BE(sat)}$ $I_{C}=100mA$, $I_{B}=0.1mA$ 1.3 2.0 V C-B Breakdown Voltage $V_{(BR)CBO}$ $I_{C}=10\mu A$, $I_{E}=0$ 80 V C-E Breakdown Voltage $V_{(BR)CEO}$ $I_{C}=1mA$, $I_{C}=0$ 50 V	Output Capacitance		VCB=10V.f=1MHz		10		pF
B-E Saturation Voltage $V_{BE(sat)}$ $I_{C}=100\text{mA}, I_{B}=0.1\text{mA}$ 1.3 2.0 V C-B Breakdown Voltage $V_{(BR)CBO}$ $I_{C}=10\mu\text{A}, I_{E}=0$ 80 V C-E Breakdown Voltage $V_{(BR)CEO}$ $I_{C}=1\text{mA}, R_{BE}=\infty$ 50 V		VCE(cot)	IC=100mA, ID=0.1mA		0.8	1.2	
C-E Breakdown Voltage $V_{(BR)CEO}$ $I_{C}=10\mu$ A, $I_{E}=0$ 80 V C-E Breakdown Voltage $V_{(BR)CEO}$ $I_{C}=1$ mA, $I_{BE}=\infty$ 50 V	_	VDE(Sat)	IC=100mA, ID=0.1mA		1.3	2.0	v
C-E Breakdown voltage $V_{(BR)CEO} \perp_{C=1mA}, R_{BE}=\infty$ 50 v		Vanyady	IC=104 A, In=0	80			v
E-B Breakdown Voltag Vancer T-10% A.Ta=0 10 V		OEO(AE)	Ic=1mA.Rpp=00	50			V
	E-B Breakdown Voltag	OZJCEO)	I _E =10\(\(\frac{1}{2}\)\(\frac{1}2\)\(\frac{1}{2}\)\(\frac{1}2\)\(\frac{1}2\)\(\frac{1}2\)\(\fr	10			V

Electrical Connection



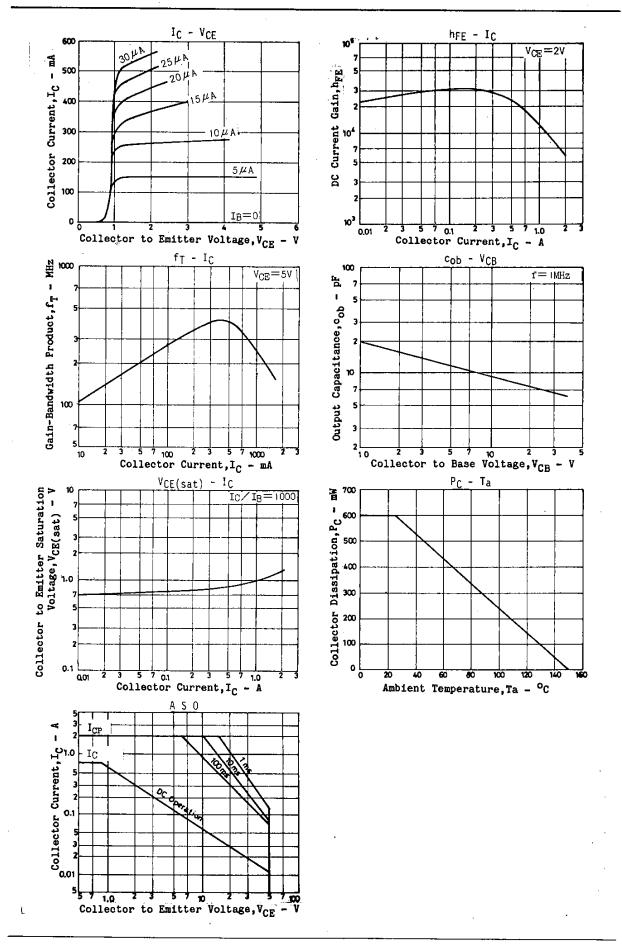


JEDEC: TO-92 EIAJ: SC-43 SANYO: NP

B. Base

C. Collector E. Emitter

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