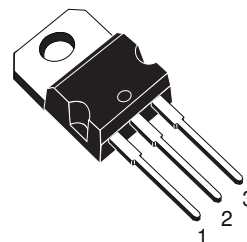


SILICON NPN POWER DARLINGTON TRANSISTOR

- STMicroelectronics PREFERRED SALESTYPE
- NPN DARLINGTON
- HIGH CURRENT CAPABILITY
- INTEGRATED ANTIPARALLEL COLLECTOR-EMITTER DIODE

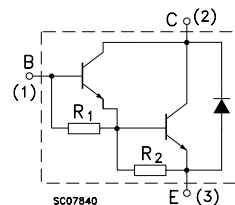
DESCRIPTION

The device is a silicon Epitaxial-Base NPN power transistor in monolithic Darlington configuration mounted in Jedec TO-220 plastic package. It is intended for use in low and medium frequency power applications.



TO-220

INTERNAL SCHEMATIC DIAGRAM



R₁ Typ. = 10 KΩ R₂ Typ. = 160 Ω

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{CBO}	Collector-Base Voltage (I _B = 0)	80	V
V _{CEV}	Collector-Emitter Voltage (V _{BE} = -1.5V)	80	V
V _{CER}	Collector-Emitter Voltage (R _{BE} ≤ 100Ω)	80	V
V _{CEO}	Collector-Emitter Voltage (I _B = 0)	80	V
V _{EBO}	Emitter-Base Voltage (I _C = 0)	5	V
I _C	Collector Current	10	A
I _{CM}	Collector Peak Current	15	A
I _B	Base Current	0.25	A
P _{tot}	Total Dissipation at T _c ≤ 25 °C	65	W
T _{stg}	Storage Temperature	-65 to 150	°C
T _j	Max. Operating Junction Temperature	150	°C

THERMAL DATA

$R_{thj-case}$	Thermal Resistance Junction-case	Max	1.92	$^{\circ}\text{C/W}$
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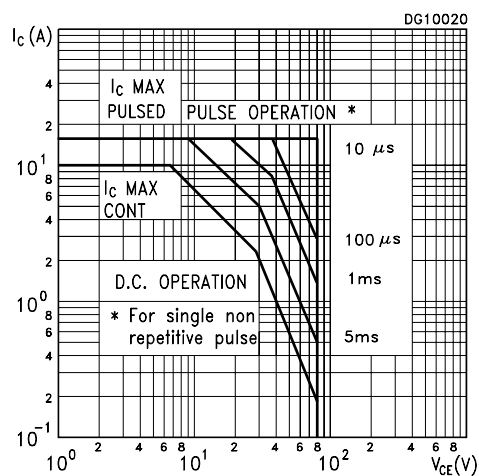
ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEV}	Collector Cut-off Current ($V_{BE} = -1.5\text{V}$)	$V_{CE} = 80\text{ V}$ $V_{CE} = 80\text{ V}$ $T_c = 125^{\circ}\text{C}$			0.3 3	mA mA
I_{CEO}	Collector Cut-off Current ($I_B = 0$)	$V_{CE} = 80\text{ V}$			1	mA
I_{EBO}	Emitter Cut-off Current ($I_C = 0$)	$V_{EB} = 5\text{ V}$			5	mA
$V_{CEO(sus)}^*$	Collector-Emitter Sustaining Voltage ($I_B = 0$)	$I_C = 200\text{ mA}$	80			V
$V_{CER(sus)}^*$	Collector-Emitter Sustaining Voltage	$I_C = 200\text{ mA}$ $R_{BE} = 100\ \Omega$	80			V
$V_{CEV(sus)}^*$	Collector-Emitter Sustaining Voltage	$I_C = 200\text{ mA}$ $V_{BE} = -1.5\text{V}$	80			V
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = 5\text{ A}$ $I_B = 10\text{ mA}$ $I_C = 10\text{ A}$ $I_B = 100\text{ mA}$			2 3	V V
V_{BE}^*	Base-Emitter Voltage	$I_C = 5\text{ A}$ $V_{CE} = 3\text{ V}$ $I_C = 10\text{ A}$ $V_{CE} = 3\text{ V}$			2.8 4.5	V V
h_{FE}^*	DC Current Gain	$I_C = 5\text{ A}$ $V_{CE} = 3\text{ V}$ $I_C = 10\text{ A}$ $V_{CE} = 3\text{ V}$	1000 100		20000	
h_{fe}	Small Signal Current Gain	$I_C = 1\text{ A}$ $V_{CE} = 10\text{ V}$ $f = 1\text{MHz}$ $I_C = 1\text{ A}$ $V_{CE} = 10\text{ V}$ $f = 1\text{KHz}$	20 1000			
V_F^*	Parallel-diode Forward Voltage	$I_F = 10\text{ A}$			4	V
C_{CBO}	Collector Base Capacitance	$I_E = 0$ $V_{CB} = 10\text{ V}$ $f = 1\text{MHz}$			200	pF
$I_{s/b}^{**}$	Second Breakdown Collector Current	$V_{CE} = 25\text{ V}$	2.6			A
$E_{s/b}$	Second Breakdown Energy	$L = 12\text{ mH}$ $R_{BE} = 100\ \Omega$ $V_{BE} = -1.5\text{ V}$ $I_C = 4.5\text{ A}$	120			mJ

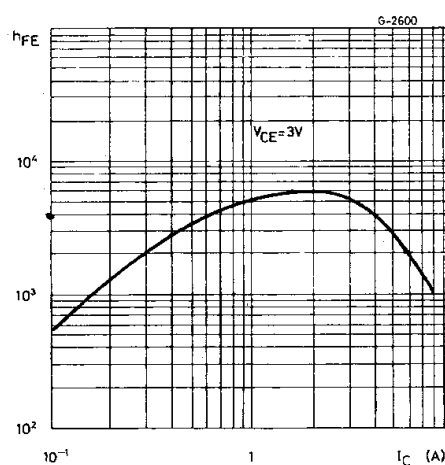
* Pulsed: Pulse duration = 300 μs , duty cycle 1.5 %

** Pulsed: Pulse duration = 100ms non repetitive pulse.

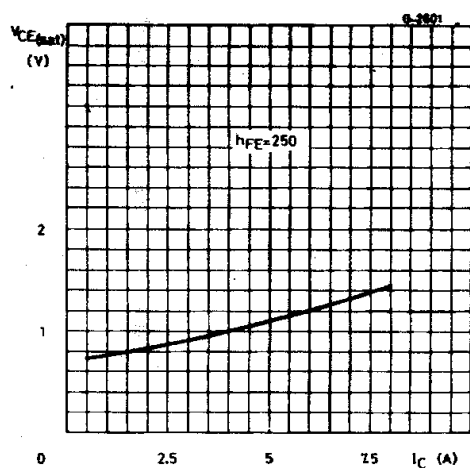
Safe Operating Area



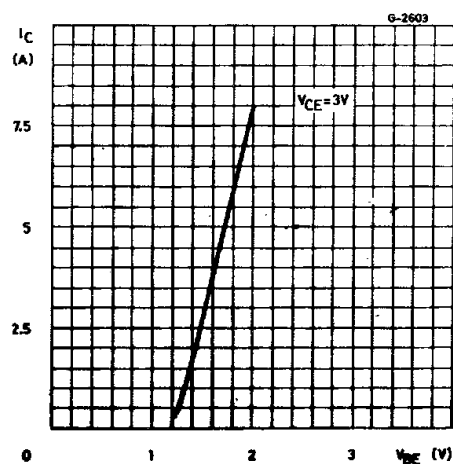
DC Current Gain



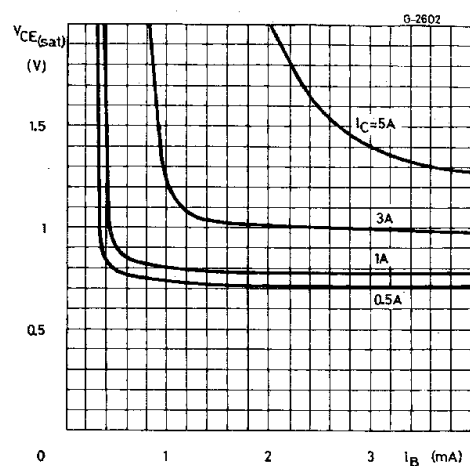
Collector Emitter Saturation Voltage



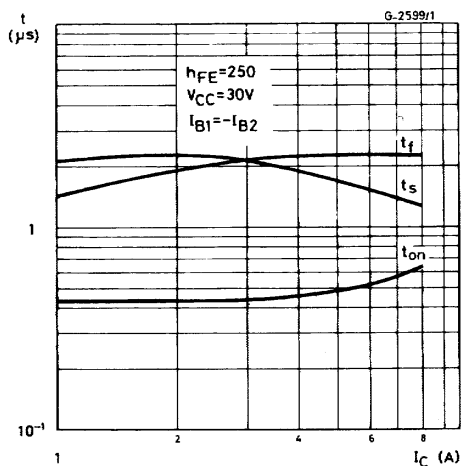
DC Transconductance



Collector Emitter Saturation Voltage

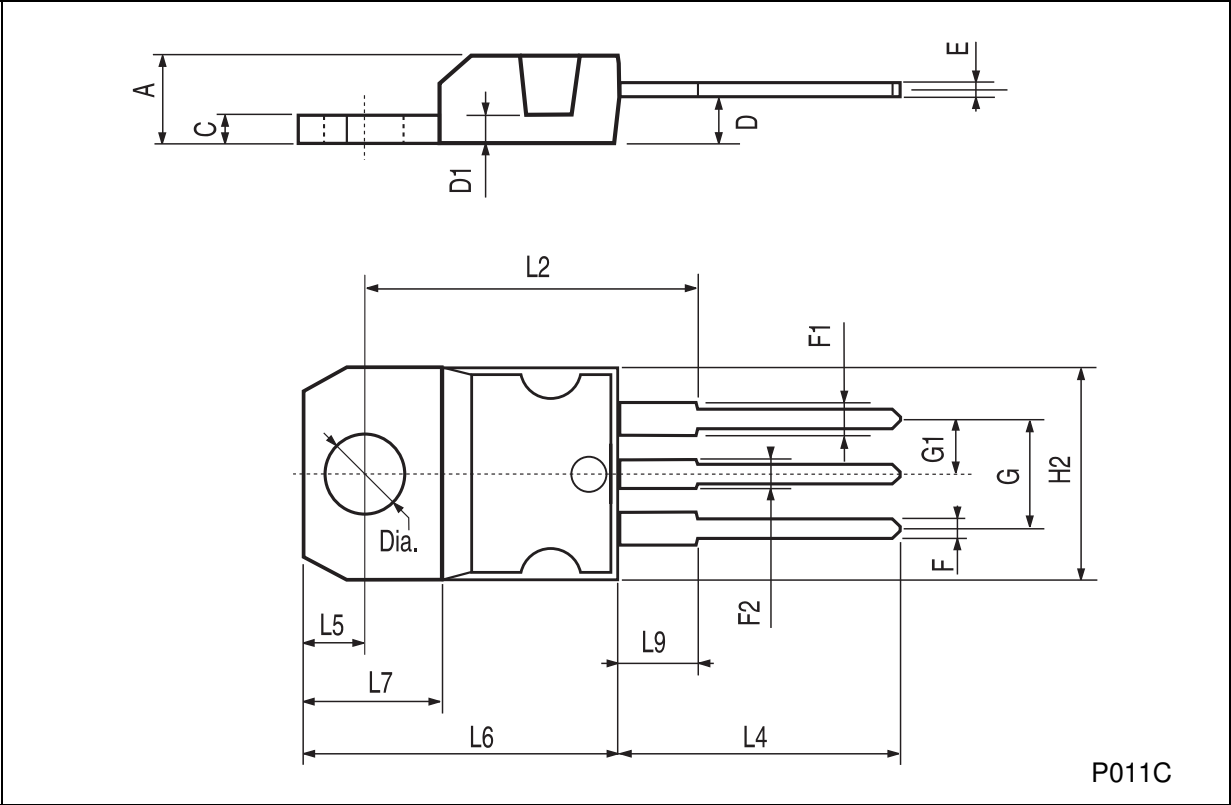


Saturated Switching Characteristics



TO-220 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.40	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151



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