

## NPN SILICON POWER TRANSISTOR

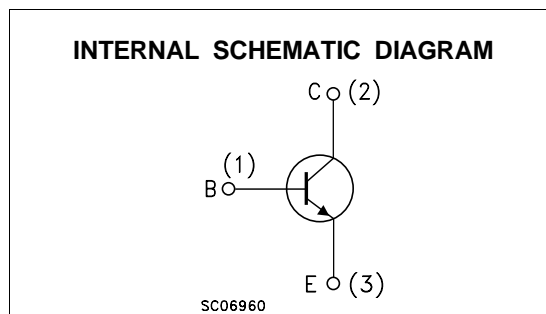
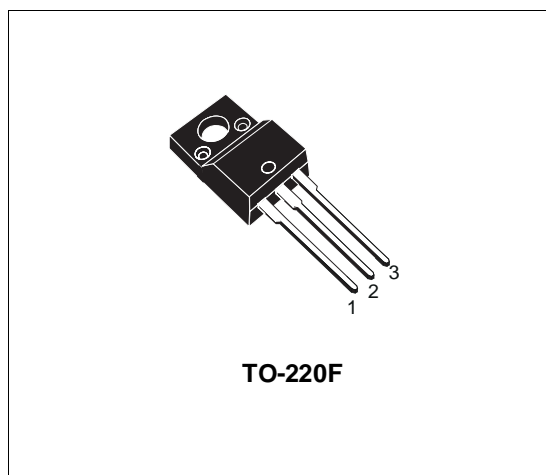
- HIGH DC CURRENT GAIN
- LOW SATURATION VOLTAGE
- INSULATED PACKAGE FOR EASY MOUNTING

### APPLICATIONS

- GENERAL PURPOSE POWER AMPLIFIERS
- GENERAL PURPOSE SWITCHING

### DESCRIPTION

The 2SD2012 is a silicon NPN power transistor housed in TO-220F insulated package. It is intended for power linear and switching applications.



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_{CB0}$	Collector-Base Voltage ( $I_E = 0$ )	60	V
$V_{CE0}$	Collector-Emitter Voltage ( $I_B = 0$ )	60	V
$V_{EB0}$	Emitter-Base Voltage ( $I_C = 0$ )	7	V
$I_C$	Collector Current	3	A
$I_{CM}$	Collector Peak Current ( $t_p < 5$ ms)	6	A
$I_B$	Base Current	0.5	A
$P_{tot}$	Total Dissipation at $T_c \leq 25$ °C	25	W
$V_{isol}$	Insulation Withstand Voltage (RMS) from All Three Leads to External Heatsink	1500	V
$T_{stg}$	Storage Temperature	-65 to 150	°C
$T_j$	Max. Operating Junction Temperature	150	°C

**THERMAL DATA**

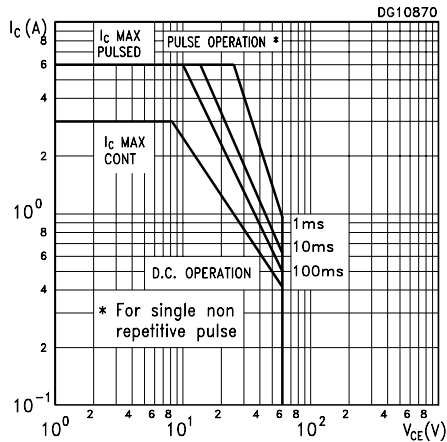
$R_{thj-case}$	Thermal Resistance Junction-case	Max	5	°C/W
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**ELECTRICAL CHARACTERISTICS** ( $T_{case} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)

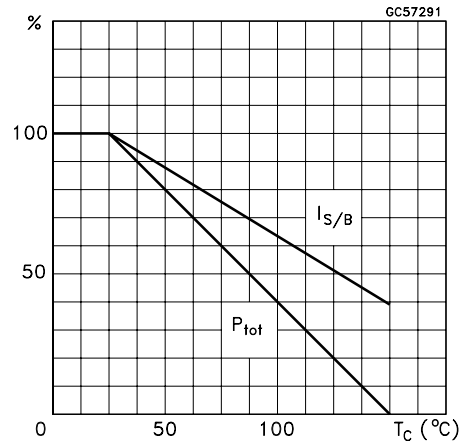
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cut-off Current ( $I_E = 0$ )	$V_{CB} = 60\text{ V}$				100	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = 7\text{ V}$				100	$\mu\text{A}$
$V_{(BR)CEO}^*$	Collector-Emitter Breakdown Voltage ( $I_B = 0$ )	$I_C = 50\text{ mA}$		60			V
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = 2\text{ A}$	$I_B = 0.2\text{ A}$		0.4	1	V
$V_{BE}^*$	Base-Emitter Voltage	$I_C = 0.5\text{ A}$	$V_{CE} = 5\text{ V}$		0.75	1	V
$h_{FE}^*$	DC Current Gain	$I_C = 0.5\text{ A}$ $I_C = 2\text{ A}$	$V_{CE} = 5\text{ V}$ $V_{CE} = 5\text{ V}$	100 20		320	
$f_T$	Transition frequency	$V_{CE} = 5\text{ V}$	$I_C = 0.5\text{ A}$		3		MHz
$C_{CBO}$	Collector-Base Capacitance	$V_{CB} = 10\text{ V}$	$I_E = 0$		35		pF

\* Pulsed: Pulse duration = 300  $\mu\text{s}$ , duty cycle  $\leq 2\%$

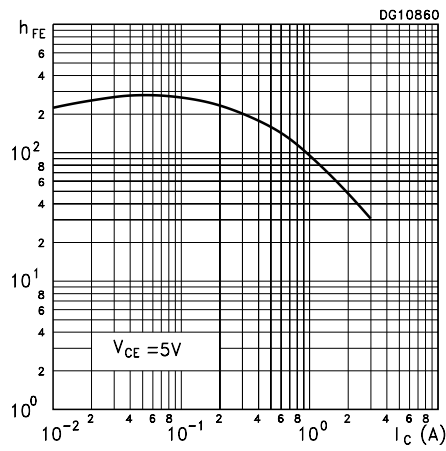
Safe Operating Area



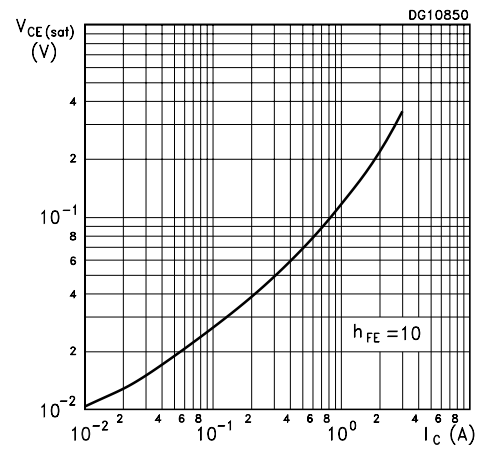
Derating Curve



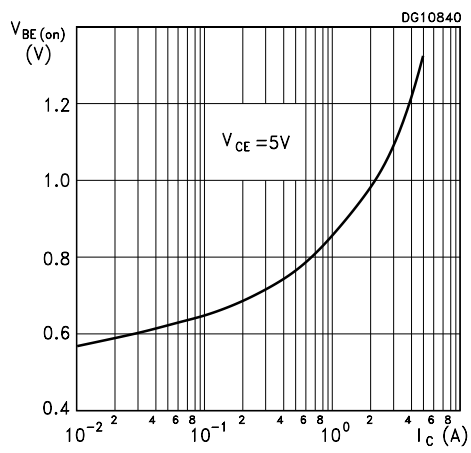
DC Current Gain



Collector Emitter Saturation Voltage

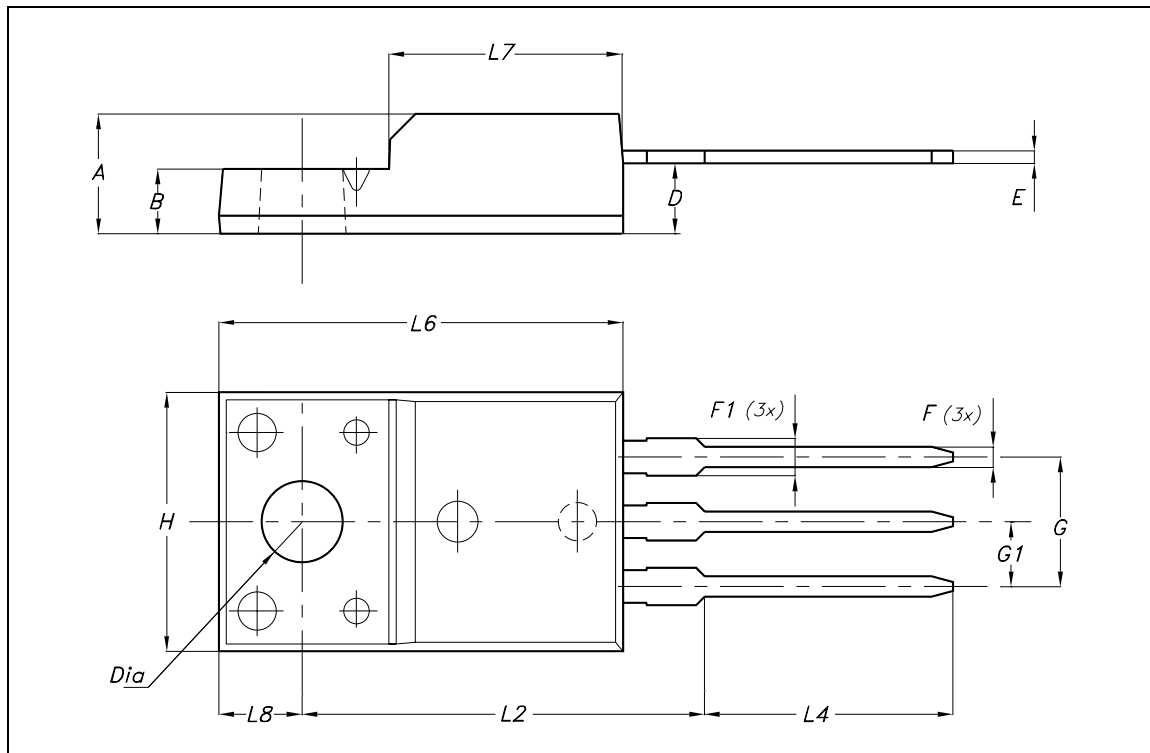


Base Emitter On Voltage



## TO-220F MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.50		4.90	0.177		0.193
B	2.34		2.74	0.092		0.108
D	2.56		2.96	0.101		0.117
E	0.45	0.50	0.60	0.018	0.020	0.024
F	0.70		0.90	0.028		0.035
F1			1.47			0.058
G		5.08			0.200	
G1	2.34	2.54	2.74	0.092	0.100	0.108
H	9.96		10.36	0.392		0.408
L2		15.80			0.622	
L4	9.45		10.05	0.372		0.396
L6	15.67		16.07	0.617		0.633
L7	8.99		9.39	0.354		0.370
L8		3.30			0.130	
Dia	3.08		3.28	0.121		0.129



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