

Silicon NPN Power Transistors

2SD1238L

DESCRIPTION

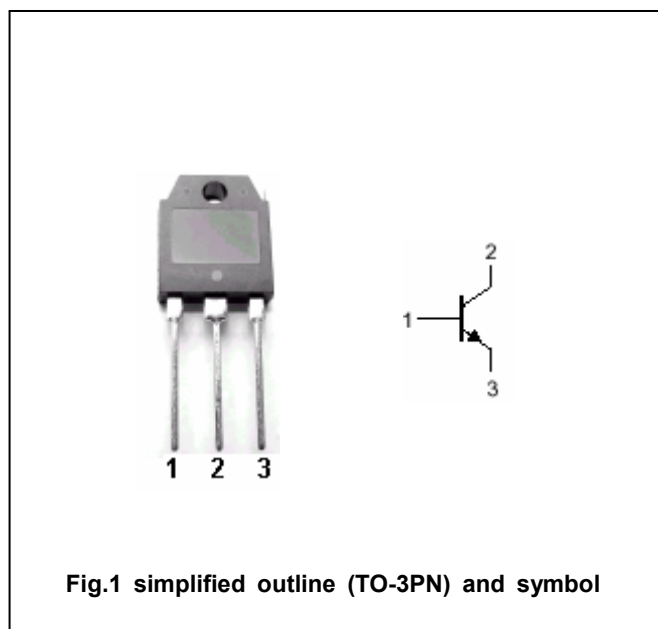
- With TO-3PN package
- Low collector saturation voltage
- Wide area of safe operation
- Complement to type 2SB922L

APPLICATIONS

- Suitable for relay drivers, high-speed inverters, converters, and other large-current switching applications

PINNING

PIN	DESCRIPTION
1	Base
2	Collector; connected to mounting base
3	Emitter

Absolute maximum ratings ($T_a=25^\circ\text{C}$)

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
V_{CBO}	Collector-base voltage	Open emitter	90	V
V_{CEO}	Collector-emitter voltage	Open base	80	V
V_{EBO}	Emitter-base voltage	Open collector	6	V
I_C	Collector current (DC)		12	A
I_{CM}	Collector current-peak		20	A
P_C	Collector power dissipation	$T_C=25^\circ\text{C}$	80	W
T_j	Junction temperature		150	$^\circ\text{C}$
T_{stg}	Storage temperature		-55~150	$^\circ\text{C}$

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CHARACTERISTICS

Tj=25°C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	$I_C=1mA; R_{BE}=\infty$	80			V
$V_{(BR)CBO}$	Collector-base breakdown voltage	$I_C=1mA; I_E=0$	90			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage	$I_E=1mA; I_C=0$	6			V
V_{CEsat}	Collector-emitter saturation voltage	$I_C=6A; I_B=0.6A$			0.4	V
I_{CBO}	Collector cut-off current	$V_{CB}=80V; I_E=0$			0.1	mA
I_{EBO}	Emitter cut-off current	$V_{EB}=4V; I_C=0$			0.1	mA
h_{FE-1}	DC current gain	$I_C=1A; V_{CE}=2V$	70		280	
h_{FE-2}	DC current gain	$I_C=6A; V_{CE}=2V$	30			
f_T	Transition frequency	$I_C=1A; V_{CE}=5V$		20		MHz

Switching times

t_{on}	Turn-on time	$I_C=5A; I_{B1}=-I_{B2}=-0.5A$ $V_{CC}=50V; R_L=10\Omega$		0.2		μs
t_s	Storage time			1.7		μs
t_f	Fall time			0.2		μs

◆ h_{FE-1} Classifications

Q	R	S
70-140	100-200	140-280

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[illegible]

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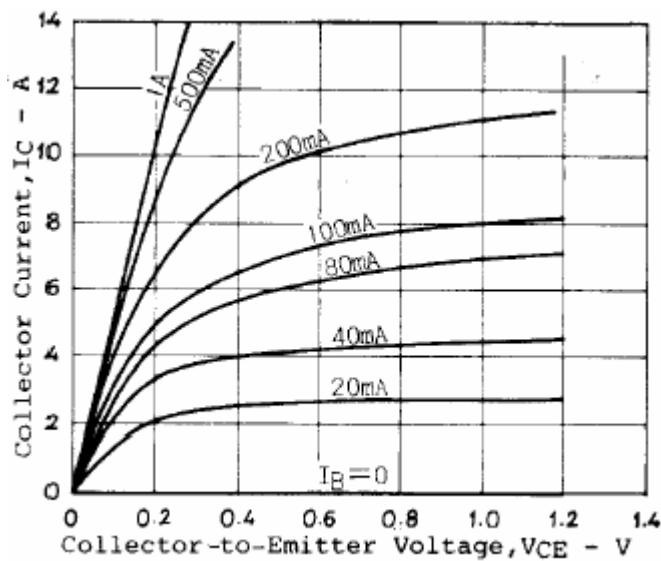


Fig.3 Static Characteristic

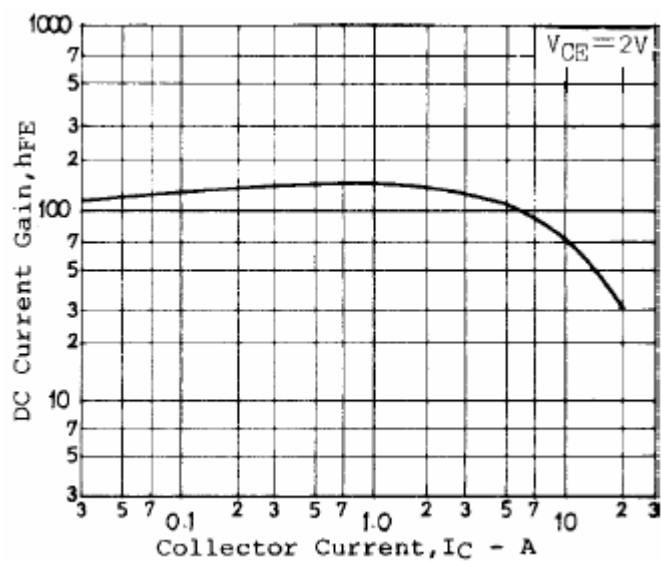


Fig.4 DC current Gain

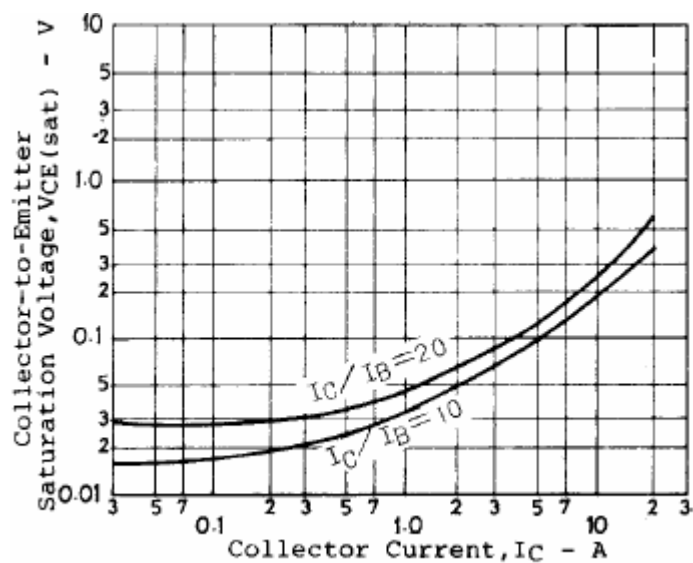


Fig.5 Collector-Emitter Saturation Voltage

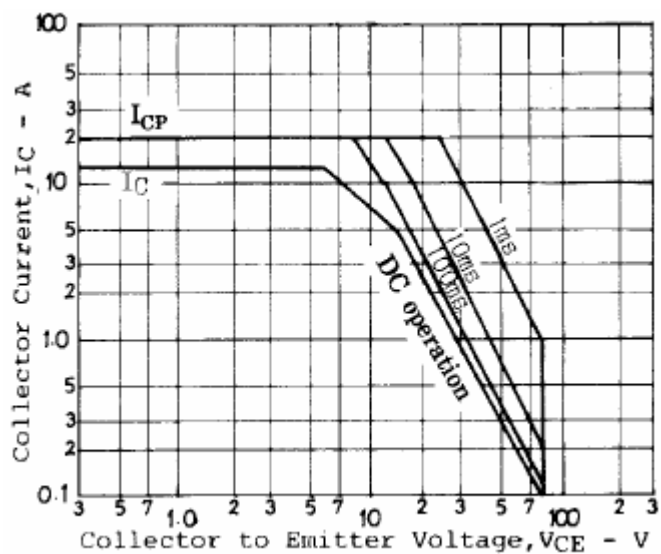


Fig.6 Safe Operating Area