Ordering number : EN686K

2SD1060

Bipolar Transistor
50V, 5A, Low V_{CE}(sat) NPN TO-220-3L

ON Semiconductor®
http://onsemi.com

Applications

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

Features

- Low collector-to-emitter saturation voltage : V_{CE}(sat)=0.3V max / I_C=3A, I_B= 0.3A

Specifications

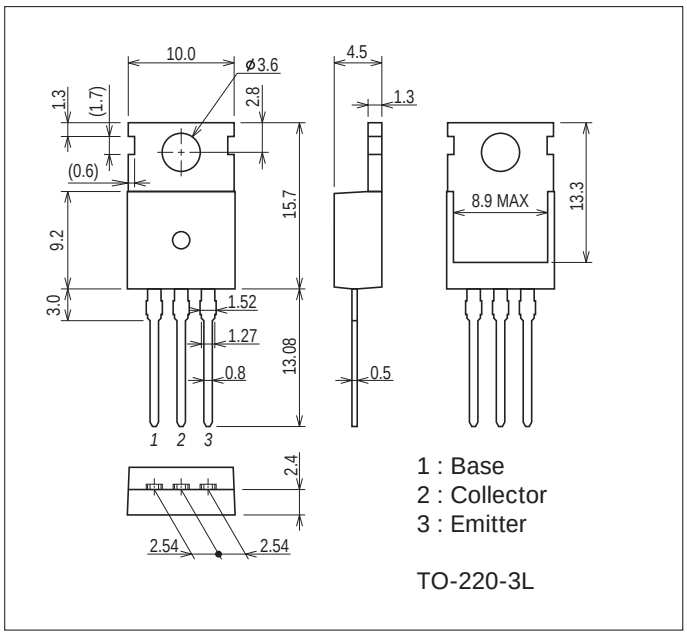
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		60	V
Collector-to-Emitter Voltage	V_{CEO}		50	V
Emitter-to-Base Voltage	V_{EBO}		6	V
Collector Current	I_C		5	A
Collector Current (Pulse)	I_{CP}		9	A
Collector Dissipation	P_C		1.75	W
		Tc=25°C	30	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Package Dimensions

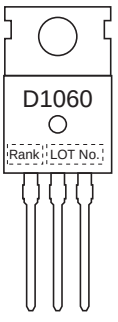
unit : mm (typ)
7536-002



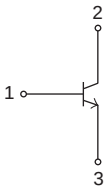
Product & Package Information

- Package : TO-220-3L
- JEITA, JEDEC : SC-46, TO-220AB
- Minimum Packing Quantity : 50 pcs./magazine

Marking



Electrical Connection



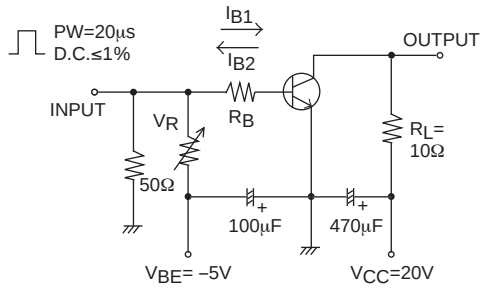
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=40V, I_E=0A			0.1	mA
Emitter Cutoff Current	I_{EBO}	V_{EB}=4V, I_C=0A			0.1	mA
DC Current Gain	$h_{FE}1$	V_{CE}=2V, I_C=1A	100*		280*	
	$h_{FE}2$	V_{CE}=2V, I_C=2A	80			
Gain-Bandwidth Product	f_T	V_{CE}=5V, I_C=1A		30		MHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		100		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=3A, I_B=0.3A			0.3	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=1mA, I_E=0A	60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=1mA, R_{BE}=∞	50			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=1mA, I_C=0A	6			V
Turn-On Time	t_{on}	See specified Test Circuit		0.1		μs
Storage Time	t_{stg}			1.4		μs
Fall Time	t_f			0.2		μs

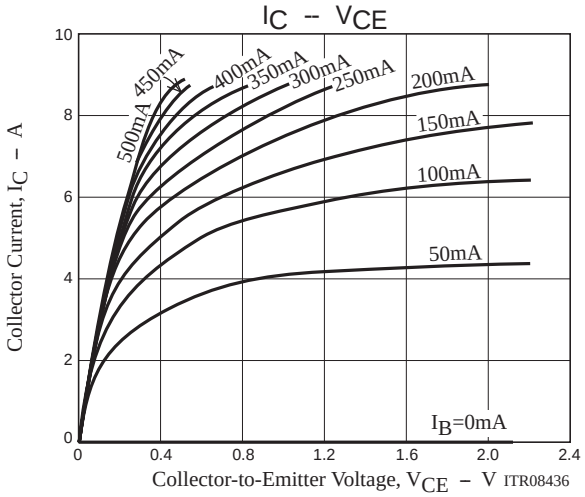
* : The 2SD1060 is classified by 1A h_{FE} as follows

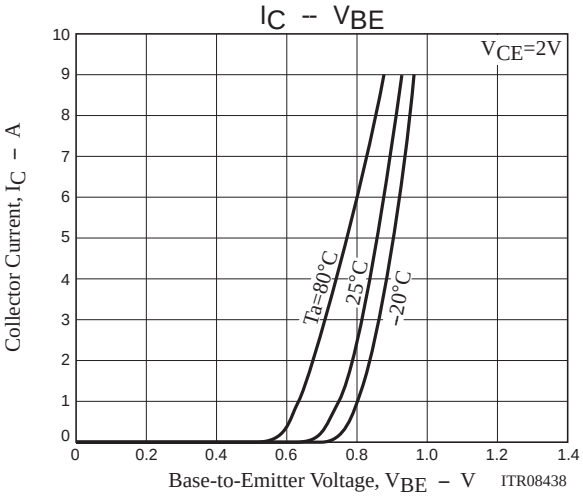
Rank	R	S
h_{FE}	100 to 200	140 to 280

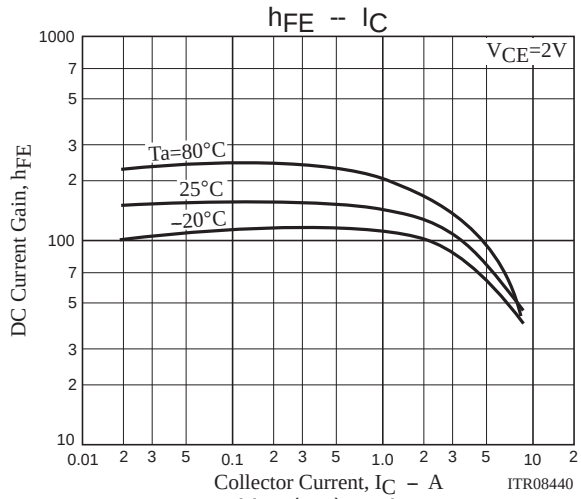
Switching Time Test Circuit

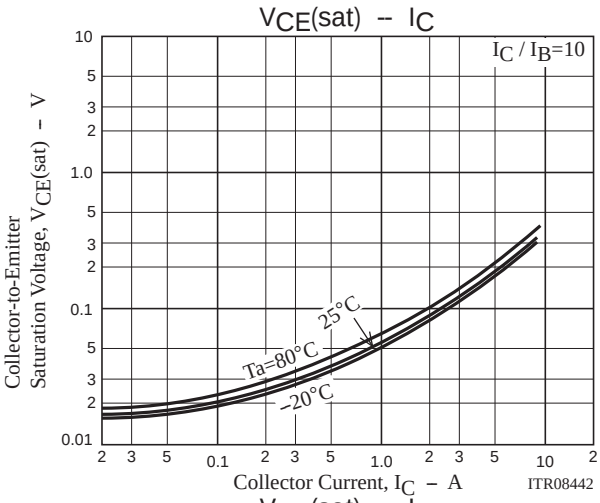


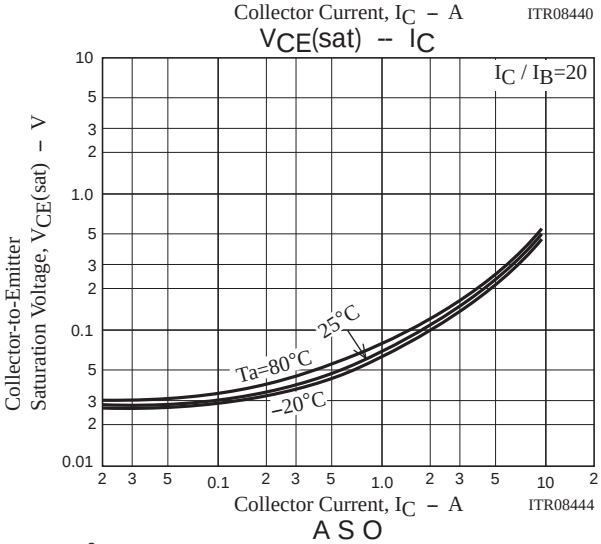
I_C=10I_{B1}= −10I_{B2}=2A

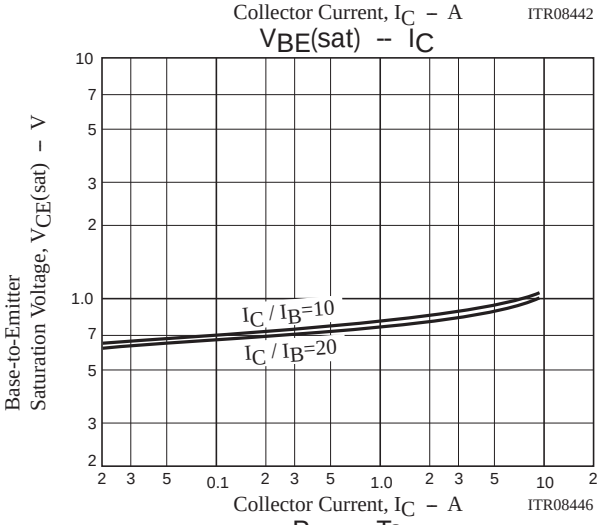


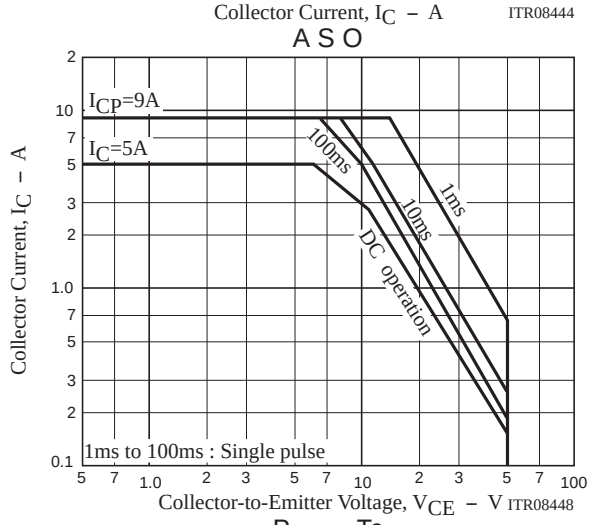


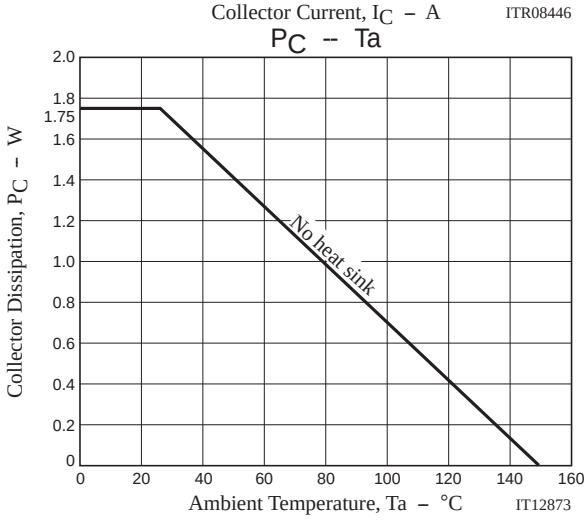

hFE -- IC
VCE=2V
Ta=80°C
25°C
–20°C
DC Current Gain, hFE
Collector Current, IC – A
ITR08440

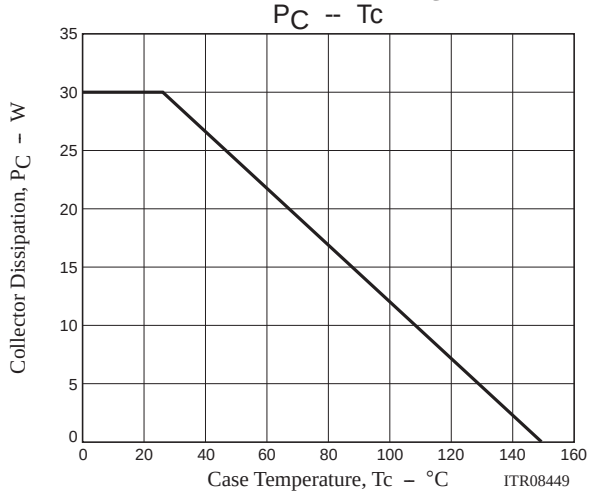

VCE(sat) -- IC
IC / IB=10
25°C
Ta=80°C
–20°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
ITR08442


VCE(sat) -- IC
IC / IB=20
25°C
Ta=80°C
–20°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
ITR08444


VBE(sat) -- IC
IC / IB=10
IC / IB=20
Base-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
ITR08446


A S O
ICP=9A
IC=5A
100ms
10ms
1ms
DC operation
1ms to 100ms : Single pulse
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR08448


PC -- Ta
No heat sink
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
IT12873


PC -- Tc
Collector Dissipation, PC – W
Case Temperature, Tc – °C
ITR08449

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