

Features

- High DC Current Gain $H_{fe} = 3500$ (Typ.) @ $I_C = 5.00A$ DC
Collector–Emitter Sustaining Voltage @ 100 mA
 $V_{CEO(SUS)} = 100$ VDC (Min.)--- 2N6052
- Monolithic Construction with Built–In Base–Emitter Shunt Resistors
- This product is available in AEC-Q101 Compliant and PPAP Capable also.

Note: For AEC-Q101 compliant products, please use suffix -AQ in the part number while ordering.

Application: General–purpose amplifier and low frequency switching. switching applications.

Absolute Maximum Ratings ($T_a = 25^\circ C$ Unless otherwise specified)

Description	Symbol	2N6052	Unit
Collector Emitter Voltage	V_{CEO}	100	V
Collector Base Voltage	V_{CB}	100	
Emitter Base Voltage	V_{EB}	5	
Collector Current Continuous	I_C	12	A
Collector Current Peak		20	
Base Current		0.2	
Total Device Dissipation @ $T_c = 25^\circ C$	P_D	150	W
Derate above $25^\circ C$		0.857	mW/ $^\circ C$
Operating and Storage Junction Temperature Range	T_j, T_{stg}	- 65 to +200	$^\circ C$

Thermal Resistance

Description	Symbol	Value	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.17	$^\circ C/W$

Electrical Characteristics

Parameter	Symbol	Test Condition	Min.	Max.	Unit
Collector-Emitter Sustaining Voltage ¹	$V_{CE(sus)}$	$I_C=100mA, I_B=0$	100	--	V
Collector Cut off Current	I_{CEO}	$V_{CE}=50V, I_B=0$	--	1	mA
Collector Cut Off Current	I_{CEX}	$V_{CE} = \text{Rated } V_{CEO}, V_{BE(OFF)}=1.5V$		0.5	
		$V_{CE} = \text{Rated } V_{CEO}, V_{BE(OFF)}=1.5V$ $T_C = 150^\circ C$		5	
Emitter Cut Off Current	I_{EBO}	$V_{BE}=5V, I_C=0$		2	
On Characteristics					
DC Current Gain	h_{FE}	$I_C=6A, V_{CE}=3V$	750	18	
		$I_C=12A, V_{CE}=3V$	100	--	
Collector Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=6A, I_B=24mA$	--	2	V
		$I_C=12A, I_B=120mA$		3	
Base-Emitter Saturation Voltage		$I_C=12A, I_B=120mA$		4	
Base Emitter On Voltage	$V_{BE(on)}$	$I_C=6A, V_{CE}=3V$		2.8	
Dynamic Characteristic					
Magnitude of common Emitter Small - Signal Short Circuit Forward Current Transfer Ratio	$ h_{fe} $	$I_C=5A, V_{CE}=3V, f=1KHz$	4	--	MHz
Output Capacitance	C_{ob}	$V_{CE} = 10V, I_E = 0, f = 1MHz$	--	500	pF
				300	
Small-Signal Current Gain	h_{fe}	$I_C = 5A, V_{CE} = 3V, f = 1MHz$	300	--	

Note:

1. Pulse Test : Pulse width <300ms, Duty Cycle <2%

Recommended Reflow Solder Profiles

The recommended reflow solder profiles for Pb and Pb-free devices are shown below.

Figure 1 shows the recommended solder profile for devices that have Pb-free terminal plating, and where a Pb free solder is used.

Figure 2 shows the recommended solder profile for devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with a leaded solder.

Figure 1

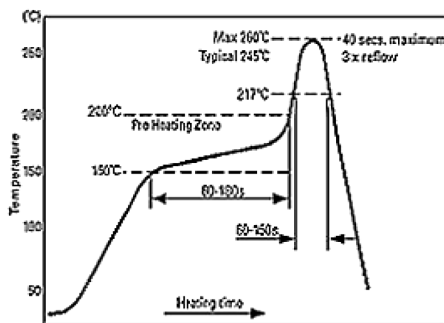
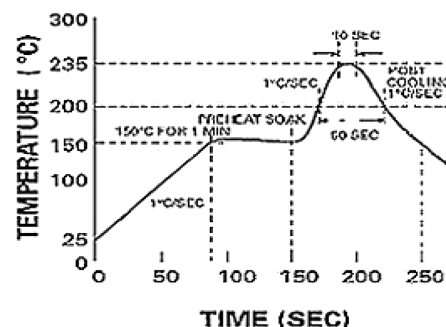


Figure 2

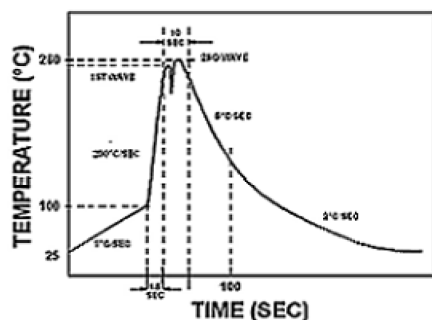


Reflow profiles in tabular form

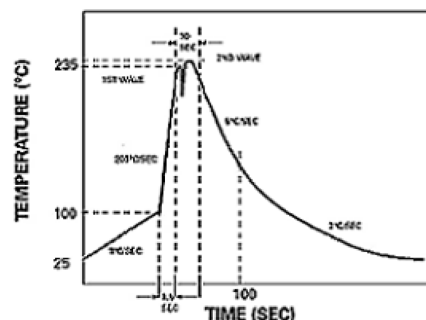
Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~3°C/second	~3°C/second
Preheat – Temperature Range – Time	150-170°C 60-180 seconds	150-200°C 60-180 seconds
Time maintained above: – Temperature – Time	200°C 30-50 seconds	217°C 60-150 seconds
Peak Temperature	235°C	260°C max.
Time within +0 -5°C of actual Peak	10 seconds	40 seconds
Ramp-Down Rate	3°C/second max.	6°C/second max.

Recommended Wave Solder Profiles

The Recommended solder Profile For Devices with Pb-free terminal plating where a Pb-free solder is used



The Recommended solder Profile For Devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with leaded solder



Wave Profiles in Tabular Form

Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~200°C/second	~200°C/second
Heating rate during preheat	Typical 1-2, Max 4°C/sec	Typical 1-2, Max 4°C/Sec
Final preheat Temperature	Within 125°C of Solder Temp	Within 125°C of Solder Temp
Peak Temperature	235°C	260°C max.
Time within +0 -5°C of actual Peak	10 seconds	10 seconds
Ramp-Down Rate	5°C/second max.	5°C/second max.

Typical Characteristics Curves

Fig 1: Power Derating

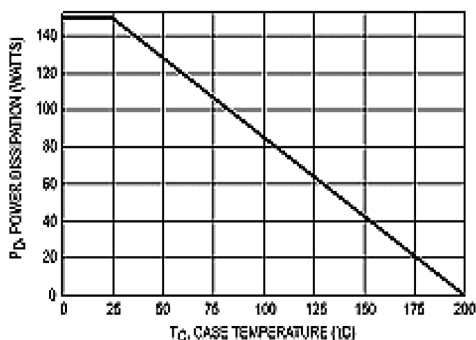


Fig 2: Switching Time

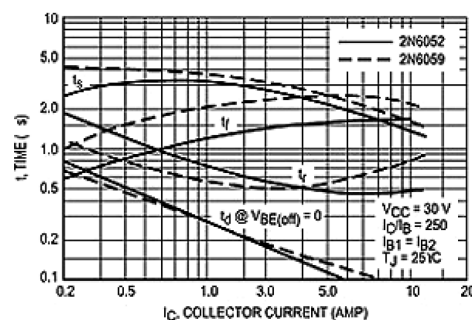


Figure 3. Switching Times

Fig 3: Thermal Response

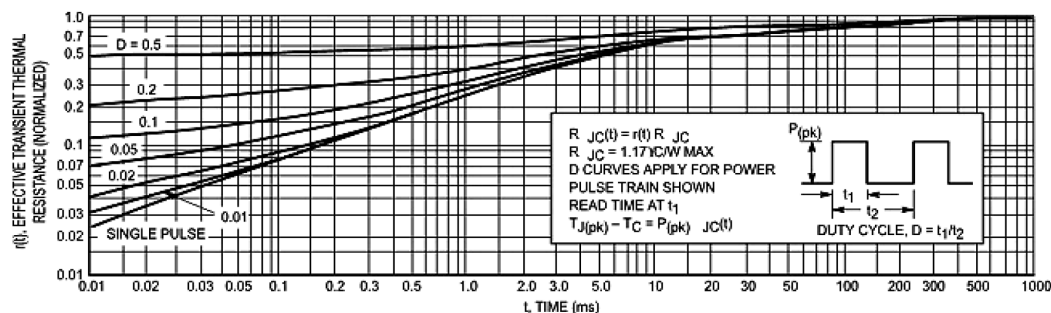


Fig 5: Small Signal Current Gain

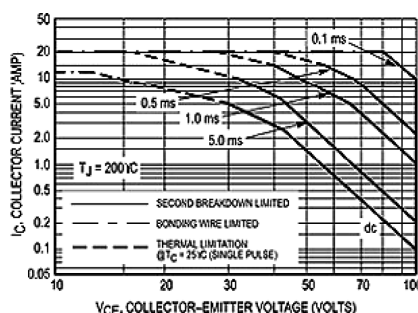
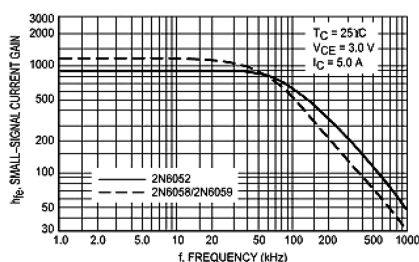


Fig 7: Capacitance

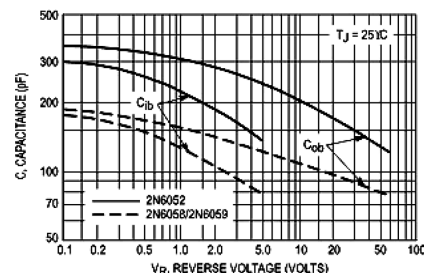


Fig 8: DC Current Gain

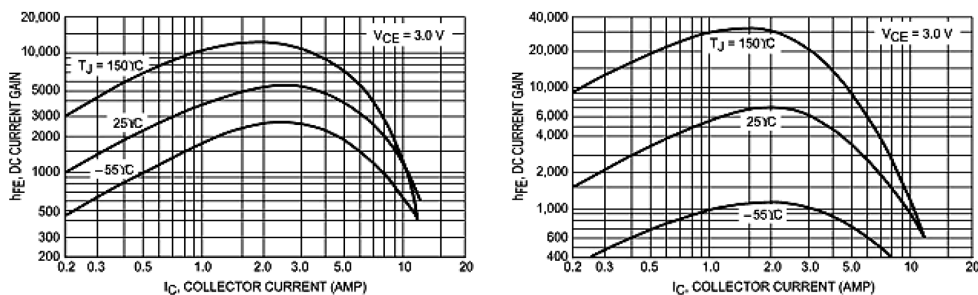


Fig 8: DC Current Gain

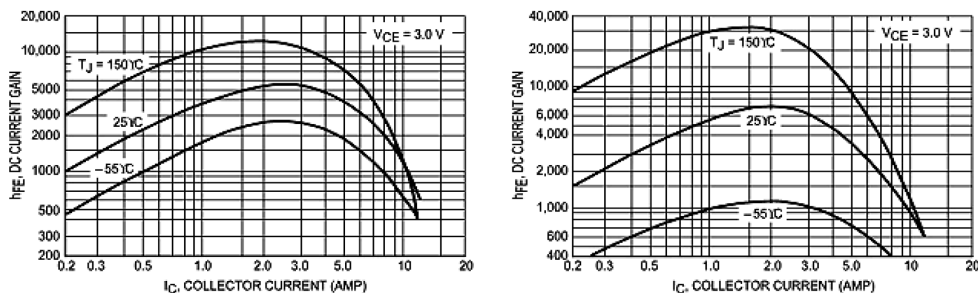
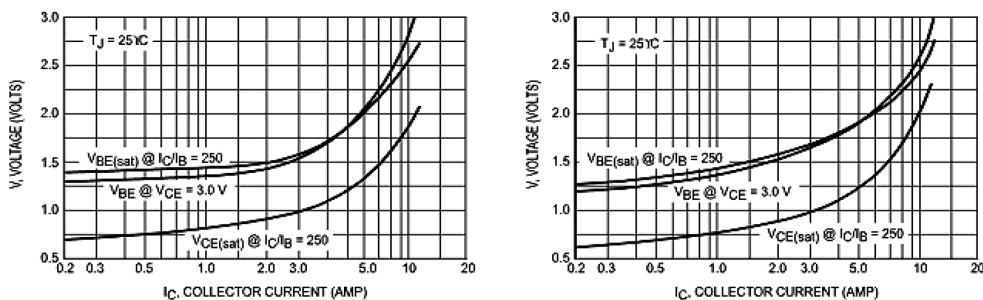
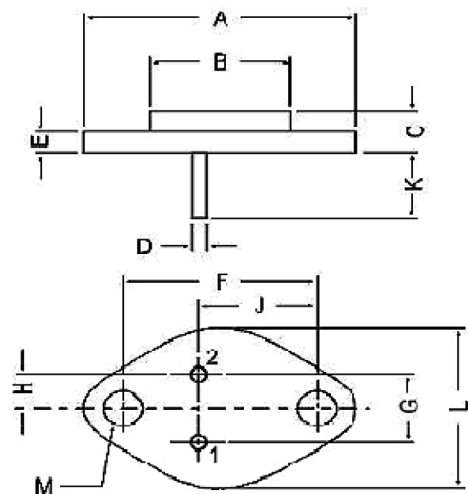


Fig 10: "On" Voltage



Package Details

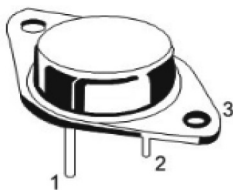
TO-3 Metal Can Package



DIM	MIN	MAX
A	--	39.37
B	--	22.22
C	6.35	8.5
D	0.96	1.09
E	--	1.77
F	29.9	30.4
G	10.69	11.18
H	5.2	5.72
J	16.64	17.15
K	11.15	12.25
L	--	26.67
M	3.84	4.19

PIN CONFIGURATION

- 1. BASE
- 2. EMITTER
- 3. COLLECTOR



Part Number Table

Description	Part Number
Darlington Transistor, PNP, 100V, 12A, TO-3	2N6052

Dimensions : Millimetres

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