

2N5038

NPN Silicon Transistors

Fast switching speeds and high current capacity ideally suit these parts for use in switching regulators, inverters, wide-band amplifiers and power oscillators in industrial and commercial applications.

Features

- High Speed - $t_f = 0.5 \mu s$ (Max)
- High Current - $I_{C(max)} = 30$ Amps
- Low Saturation - $V_{CE(sat)} = 2.5$ V (Max) @ $I_C = 20$ Amps
- Pb-Free Package is Available*

MAXIMUM RATINGS (Note 1)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	90	Vdc
Collector-Base Voltage	V_{CBO}	150	Vdc
Collector-Emitter Voltage	V_{CEV}	150	Vdc
Emitter-Base Voltage	V_{EBO}	7	Vdc
Collector Current - Continuous Peak (Note 2)	I_C I_{CM}	20 30	Adc
Base Current - Continuous	I_B	5	Adc
Total Device Dissipation @ $T_C = 25^\circ C$ Derate above $25^\circ C$	P_D	140 0.8	W W/ $^\circ C$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ C$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.25	$^\circ C/W$

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.

1. Indicates JEDEC Registered Data.
2. Pulse Test: Pulse Width ≤ 10 ms, Duty Cycle $\leq 50\%$.

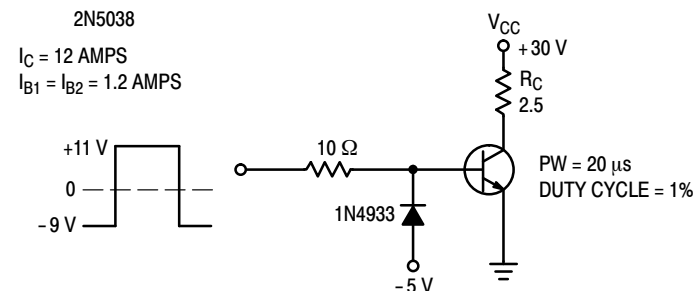


Figure 1. Switching Time Test Circuit

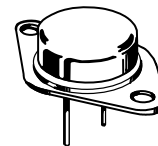
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



ON Semiconductor®

<http://onsemi.com>

20 AMPERE
NPN SILICON
POWER TRANSISTORS
90 VOLTS - 140 WATTS



TO-204AA (TO-3)
CASE 1-07
STYLE 1

MARKING DIAGRAMS



G = Pb-Free Package
A = Assembly Location
YY = Year
WW = Work Week
MEX = Country of Origin

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted) (Note 3)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage (Note 4) ($I_C = 200\text{ mAdc}$, $I_B = 0$)	$V_{CEO(sus)}$	90	-	Vdc
Collector Cutoff Current ($V_{CE} = 140\text{ Vdc}$, $V_{BE(off)} = 1.5\text{ V}$) ($V_{CE} = 100\text{ Vdc}$, $V_{BE(off)} = 1.5\text{ Vdc}$, $T_C = 150^\circ\text{C}$)	I_{CEX}	- -	50 10	mAdc
Emitter Cutoff Current ($V_{EB} = 5\text{ Vdc}$, $I_C = 0$) ($V_{EB} = 7\text{ Vdc}$, $I_C = 0$)	I_{EBO}	- -	5 50	mAdc
ON CHARACTERISTICS (Note 4)				
DC Current Gain ($I_C = 12\text{ Adc}$, $V_{CE} = 5\text{ Vdc}$)	h_{FE}	20	100	-
Collector-Emitter Saturation Voltage ($I_C = 20\text{ Adc}$, $I_B = 5\text{ Adc}$)	$V_{CE(sat)}$	-	2.5	Vdc
Base-Emitter Saturation Voltage ($I_C = 20\text{ Adc}$, $I_B = 5\text{ Adc}$)	$V_{BE(sat)}$	-	3.3	Vdc
DYNAMIC CHARACTERISTICS				
Magnitude of Common-Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio ($I_C = 2\text{ Adc}$, $V_{CE} = 10\text{ Vdc}$, $f = 5\text{ MHz}$)	$ h_{fe} $	12	-	-

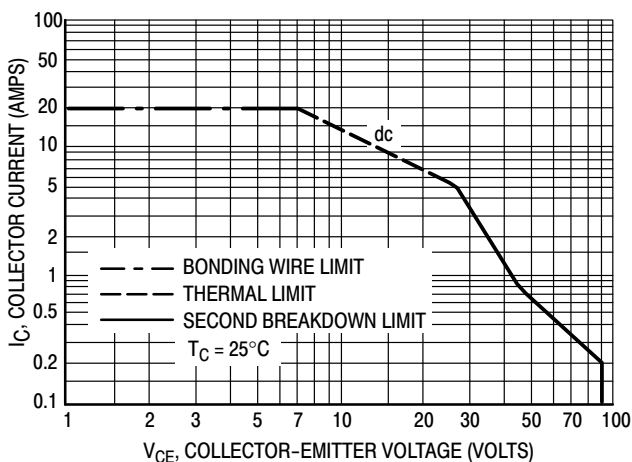
SWITCHING CHARACTERISTICS

RESISTIVE LOAD					
Rise Time	($V_{CC} = 30\text{ Vdc}$) ($I_C = 12\text{ Adc}$, $I_{B1} = I_{B2} = 1.2\text{ Adc}$)	t_r	-	0.5	μs
Storage Time		t_s	-	1.5	μs

3. Indicates JEDEC Registered Data.

4. Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2\%$.**ORDERING INFORMATION**

Device	Package	Shipping
2N5038	TO-204	100 Units / Tray
2N5038G	TO-204 (Pb-Free)	

**Figure 2. Forward Bias Safe Operating Area**

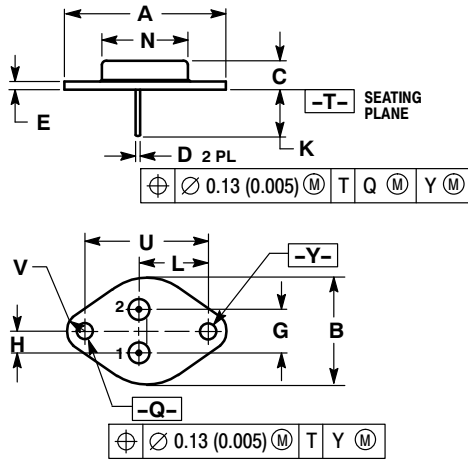
There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

Second breakdown pulse limits are valid for duty cycles to 10%. At high case temperatures, thermal limitations may reduce the power that can be handled to values less than the limitations imposed by second breakdown.

2N5038

PACKAGE DIMENSIONS

CASE 1-07 TO-204AA (TO-3) ISSUE Z



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. ALL RULES AND NOTES ASSOCIATED WITH REFERENCED TO-204AA OUTLINE SHALL APPLY.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.550 REF		39.37 REF	
B	---	1.050	---	26.67
C	0.250	0.335	6.35	8.51
D	0.038	0.043	0.97	1.09
E	0.055	0.070	1.40	1.77
G	0.430 BSC		10.92 BSC	
H	0.215 BSC		5.46 BSC	
K	0.440	0.480	11.18	12.19
L	0.665 BSC		16.89 BSC	
N	---	0.830	---	21.08
Q	0.151	0.165	3.84	4.19
U	1.187 BSC		30.15 BSC	
V	0.131	0.188	3.33	4.77

STYLE 1:
PIN 1. BASE
2. EMITTER
CASE: COLLECTOR

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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