TIP3055 (NPN), TIP2955 (PNP)

Complementary Silicon Power Transistors

Designed for general−purpose switching and amplifier applications.

Features

- DC Current Gain −
  h_{FE} = 20−70 @ I_C
  = 4.0 Adc
- Collector−Emitter Saturation Voltage −
  $V_{CE(sat)}$ = 1.1 Vdc (Max) @ I_C
  = 4.0 Adc
- Excellent Safe Operating Area
- Pb−Free Packages are Available*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector − Emitter Voltage	V_{CEO}	60	Vdc
Collector − Emitter Voltage	V_{CER}	70	Vdc
Collector − Base Voltage	V_{CB}	100	Vdc
Emitter − Base Voltage	V_{EB}	7.0	Vdc
Collector Current − Continuous	I_C	1 5	Adc
Base Current	I_B	7.0	Adc
Total Power Dissipation @ T_C = 25°C Derate above 25°C	P_D	90 0.72	W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	1.39	°C/W
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	35.7	°C/W

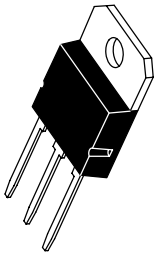
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

*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

15 AMPERE
POWER TRANSISTORS
COMPLEMENTARY SILICON
60 VOLTS, 90 WATTS



SOT−93 (TO−218)
CASE 340D
STYLE 1

MARKING DIAGRAM

A	= Assembly Location
Y	= Year
WW	= Work Week
TIPxx55	= Device Code
xx	= 30 or 29
G	= Pb−Free Package

ORDERING INFORMATION

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

ORDERING INFORMATION

Device	Package	Shipping
TIP3055	SOT−93 (TO−218)	30 Units / Rail
TIP3055G	SOT−93 (TO−218) (Pb−Free)	30 Units / Rail
TIP2955	SOT−93 (TO−218)	30 Units / Rail
TIP2955G	SOT−93 (TO−218) (Pb−Free)	30 Units / Rail

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector−Emitter Sustaining Voltage (Note 1) (I_C = 30 mAdc, I_B = 0)	$V_{CEO(sus)}$	60	−	Vdc
Collector Cutoff Current (V_{CE} = 70 Vdc, R_{BE} = 100 Ohms)	I_{CER}	−	1.0	mAdc
Collector Cutoff Current (V_{CE} = 30 Vdc, I_B = 0)	I_{CEO}	−	0.7	mAdc
Collector Cutoff Current (V_{CE} = 100 Vdc, $V_{BE(off)}$ = 1.5 Vdc)	I_{CEV}	−	5.0	mAdc
Emitter Cutoff Current (V_{BE} = 7.0 Vdc, I_C = 0)	I_{EBO}	−	5.0	mAdc
ON CHARACTERISTICS (Note 1)				
DC Current Gain (I_C = 4.0 Adc, V_{CE} = 4.0 Vdc) (I_C = 10 Adc, V_{CE} = 4.0 Vdc)	h_{FE}	 20 5.0	 70 −	−
Collector−Emitter Saturation Voltage (I_C = 4.0 Adc, I_B = 400 mAdc) (I_C = 10 Adc, I_B = 3.3 Adc)	$V_{CE(sat)}$	 − −	 1.1 3.0	Vdc
Base−Emitter On Voltage (I_C = 4.0 Adc, V_{CE} = 4.0 Vdc)	$V_{BE(on)}$	−	1.8	Vdc
SECOND BREAKDOWN				
Second Breakdown Collector Current with Base Forward Biased (V_{CE} = 30 Vdc, t = 1.0 s; Nonrepetitive)	$I_{s/b}$	3.0	−	Adc
DYNAMIC CHARACTERISTICS				
Current Gain — Bandwidth Product (I_C = 0.5 Adc, V_{CE} = 10 Vdc, f = 1.0 MHz)	f_T	2.5	−	MHz
Small−Signal Current Gain (V_{CE} = 4.0 Vdc, I_C = 1.0 Adc, f = 1.0 kHz)	h_{fe}	15	−	kHz

1. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

NOTE: For additional design curves, refer to electrical characteristics curves of 2N3055.

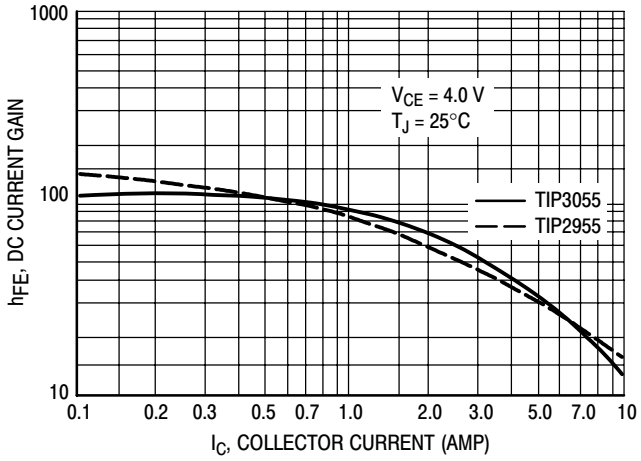


Figure 1. DC Current Gain

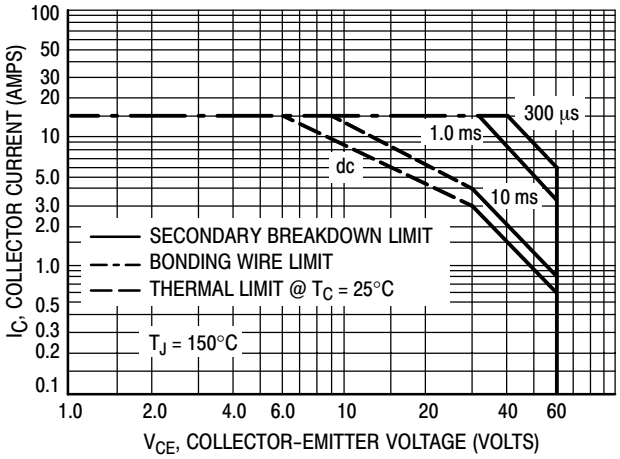


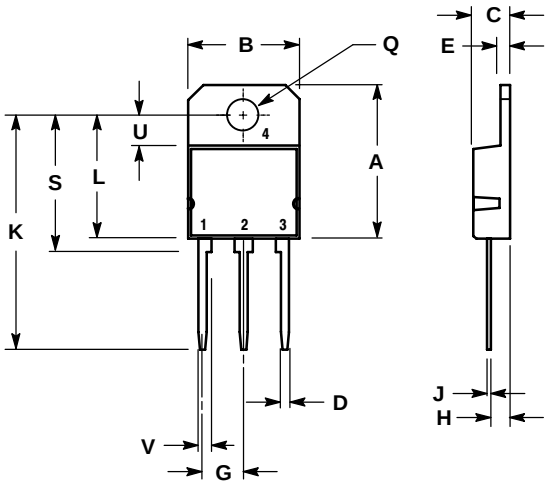
Figure 2. Maximum Rated Forward Bias Safe Operating Area

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.

The data of Figure 2 is based on T_C = 25°C; $T_{J(pk)}$ is variable depending on power level. Second breakdown pulse limits are valid for duty cycles to 10% but must be derated for temperature.

PACKAGE DIMENSIONS

SOT−93 (TO−218)
CASE 340D−02
ISSUE E



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	---	20.35	---	0.801
B	14.70	15.20	0.579	0.598
C	4.70	4.90	0.185	0.193
D	1.10	1.30	0.043	0.051
E	1.17	1.37	0.046	0.054
G	5.40	5.55	0.213	0.219
H	2.00	3.00	0.079	0.118
J	0.50	0.78	0.020	0.031
K	31.00 REF		1.220 REF	
L	---	16.20	---	0.638
Q	4.00	4.10	0.158	0.161
S	17.80	18.20	0.701	0.717
U	4.00 REF		0.157 REF	
V	1.75 REF		0.069	

STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 61312, Phoenix, Arizona 85082−1312 USA
Phone: 480−829−7710 or 800−344−3860 Toll Free USA/Canada
Fax: 480−829−7709 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada

Japan: ON Semiconductor, Japan Customer Focus Center
2−9−1 Kamimeguro, Meguro−ku, Tokyo, Japan 153−0051
Phone: 81−3−5773−3850

ON Semiconductor Website: http://onsemi.com

Order Literature: http://www.onsemi.com/litorder

For additional information, please contact your local Sales Representative.

TIP3055/D