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
- These are Pb−Free Devices*

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

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.

ON Semiconductor®

15 AMPERE POWER TRANSISTORS COMPLEMENTARY SILICON 60 VOLTS, 90 WATTS
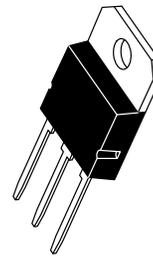
SOT−93 (TO−218)
CASE 340D
STYLE 1
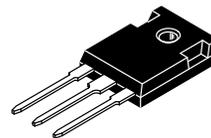
TO−247
CASE 340L
STYLE 3

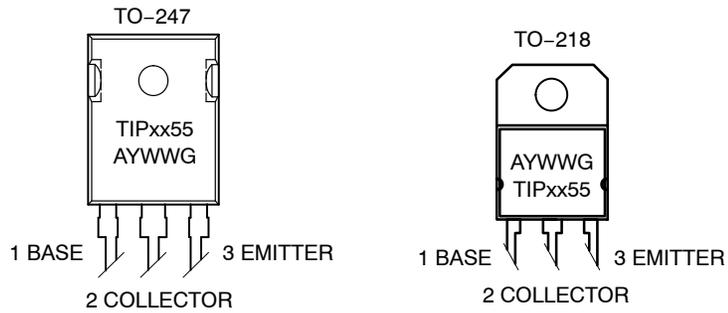**NOTE: Effective June 2012 this device will be available only in the TO−247 package. Reference FPCN# 16827.**

ORDERING INFORMATION

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

TIP3055 (NPN), TIP2955 (PNP)

MARKING DIAGRAMS

TO−247

TIPxx55
AYWWG

1 BASE 3 EMITTER

2 COLLECTOR

TO−218

AYWWG
TIPxx55

1 BASE 3 EMITTER

2 COLLECTOR

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

ORDERING INFORMATION

Device	Package	Shipping
TIP3055G	SOT−93 (TO−218) (Pb−Free)	30 Units / Rail
TIP2955G	SOT−93 (TO−218) (Pb−Free)	30 Units / Rail
TIP3055G	TO−247 (Pb−Free)	30 Units / Rail
TIP2955G	TO−247 (Pb−Free)	30 Units / Rail

TIP3055 (NPN), TIP2955 (PNP)

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

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

1. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.
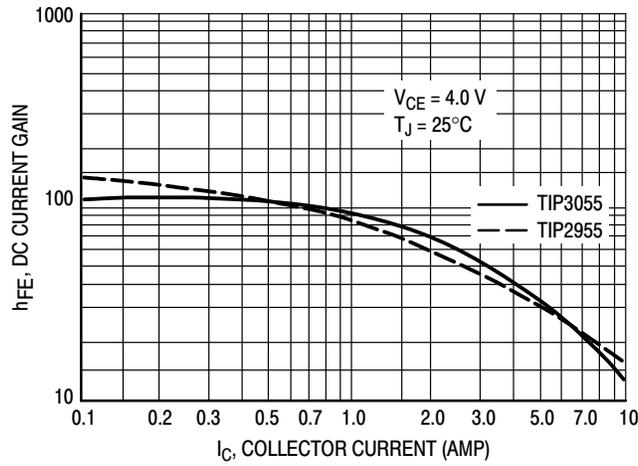
TIP3055 (NPN), TIP2955 (PNP)
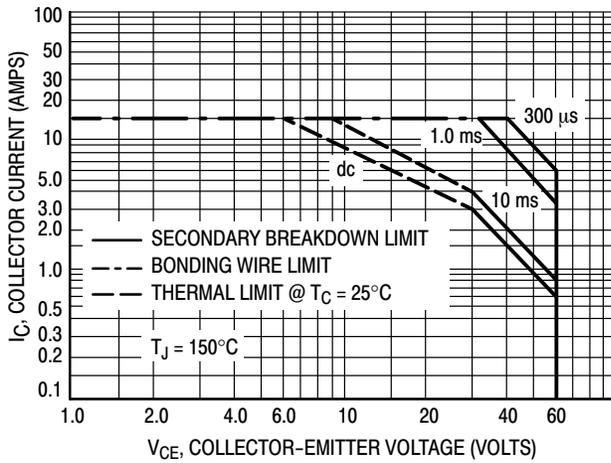

Figure 1. DC Current Gain

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.

TIP3055 (NPN), TIP2955 (PNP)

PACKAGE DIMENSIONS
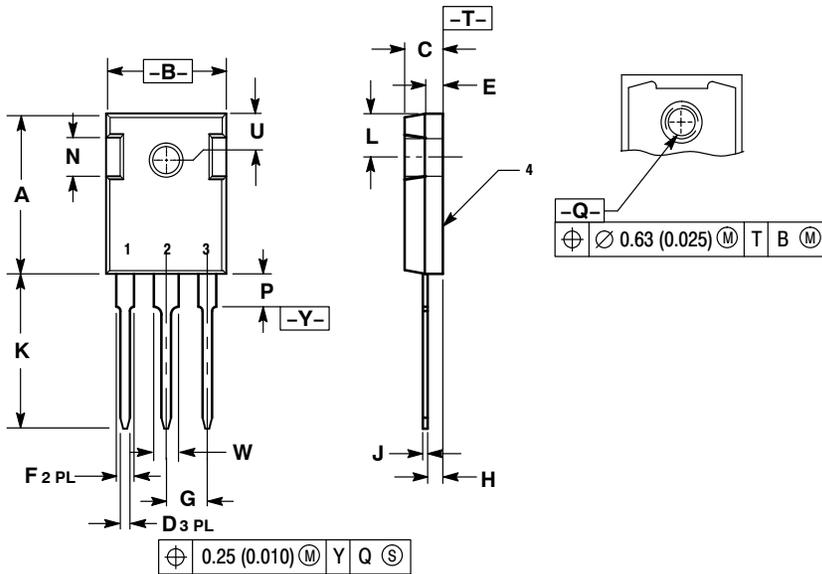
SOT−93 (TO−218)
CASE 340D−02
ISSUE E
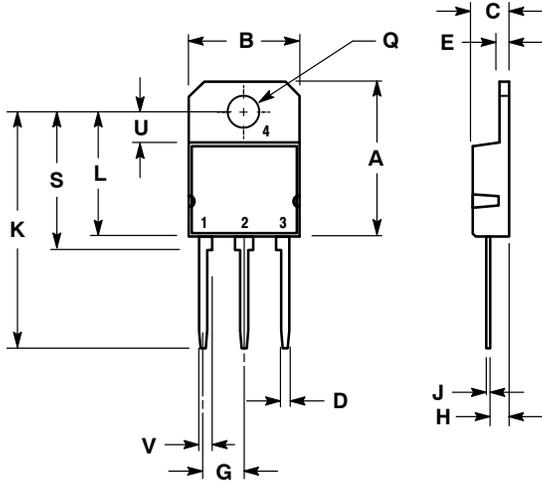
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.

DIM	MILLIMETERS		INCHES	
	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

TO−247
CASE 340L−02
ISSUE F

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

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	20.32	21.08	0.800	8.30
B	15.75	16.26	0.620	0.640
C	4.70	5.30	0.185	0.209
D	1.00	1.40	0.040	0.055
E	1.90	2.60	0.075	0.102
F	1.65	2.13	0.065	0.084
G	5.45 BSC		0.215 BSC	
H	1.50	2.49	0.059	0.098
J	0.40	0.80	0.016	0.031
K	19.81	20.83	0.780	0.820
L	5.40	6.20	0.212	0.244
N	4.32	5.49	0.170	0.216
P	---	4.50	---	0.177
Q	3.55	3.65	0.140	0.144
U	6.15 BSC		0.242 BSC	
W	2.87	3.12	0.113	0.123

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