

BUV27

NPN Silicon Power Transistor

This device is designed for use in switching regulators and motor control.

Features

- Low Collector Emitter Saturation Voltage
- Fast Switching Speed
- Pb-Free Package is Available*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Sustaining Voltage	V_{CEO}	120	Vdc
Collector-Emitter Breakdown Voltage	V_{CBO}	240	Vdc
Emitter-Base Voltage	V_{EBO}	7.0	Vdc
Collector Current – Continuous – Peak (Note 1)	I_C I_{CM}	12 20	Adc
Base Current	I_B	4.0	Adc
Total Device Dissipation ($T_C = 25^\circ\text{C}$) Derate above 25°C	P_D	70 0.56	W W/ $^\circ\text{C}$
Operating and Storage Temperature	T_J, T_{stg}	– 65 to 150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Rating	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case Junction-to-Ambient	$R_{\theta JC}$ $R_{\theta JA}$	1.78 62.5	$^\circ\text{C}/\text{W}$

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.

1. Pulse Test: Pulse Width = 5.0 ms, Duty Cycle \leq 10%.

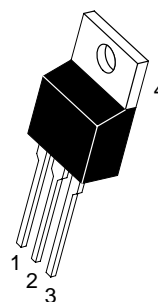


ON Semiconductor®

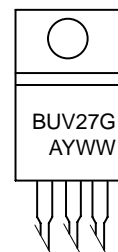
<http://onsemi.com>

POWER TRANSISTOR
12 AMPERES
120 VOLTS
70 WATTS

MARKING DIAGRAM



TO-220AB
CASE 221A
STYLE 1



BUV27 = Device Code
A = Assembly Location
Y = Year
WW = Work Week
G = Pb-Free Package

ORDERING INFORMATION

Device	Package	Shipping
BUV27	TO-220AB	50 per Rail
BUV27G	TO-220AB (Pb-Free)	50 per Rail

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

BUV27

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
I _{CER}	Collector Cut-off Current (R _{BE} = 50 Ω)	V _{CE} = 240 V, T _C = 125°C			3.0	mA
I _{CEX}	Collector Cut-off Current	V _{CE} = 240 V, V _{BE} = -1.5 V, T _C = 125°C			1.0	mA
I _{EBO}	Emitter Cut-off Current (I _C = 0)	V _{BE} = 5 V			1.0	mA
V _{CEO(sus)}	Collector-Emitter Sustaining Voltage	I _C = 0.2 A, L = 25 mH	120			V
V _{EBO}	Emitter-Base Voltage (I _C = 0)	I _E = 50 mA	7.0		30	V
V _{CE(sat)} (Note 2)	Collector-Emitter Saturation Voltage	I _C = 4 A, I _B = 0.4 A I _C = 8 A, I _B = 0.8 A			0.7 1.5	V
V _{BE(sat)} (Note 2)	Base-Emitter Saturation Voltage	I _C = 8 A, I _B = 0.8 A			2.0	V

Resistive Load

t _{on}	Turn-on Time	V _{CC} = 90 V, I _C = 8 A		0.4	0.8	ms
t _s	Storage Time	V _{BE} = -6 V, I _{B1} = 0.8 A		0.5	1.2	μs
t _f	Fall Time	R _{BB} = 3.75 Ω		0.12	0.25	μs

Inductive Load

t _s	Storage Time	V _{CC} = 90 V, I _C = 8 A		0.6		μs
t _f	Fall Time	I _{B1} = 0.8 A, V _{BE} = -5 V L _B = 1 μH		0.04		
t _s	Storage Time	V _{CC} = 90 V, I _C = 8 A			2.0	
t _f	Fall Time	I _{B1} = 0.8 A, V _{BE} = -5 V L _B = 1 μH, T _J = 125°C			0.15	

2. Pulsed: Pulse Duration = 300 μs, Duty Cycle = 2%

BUV27

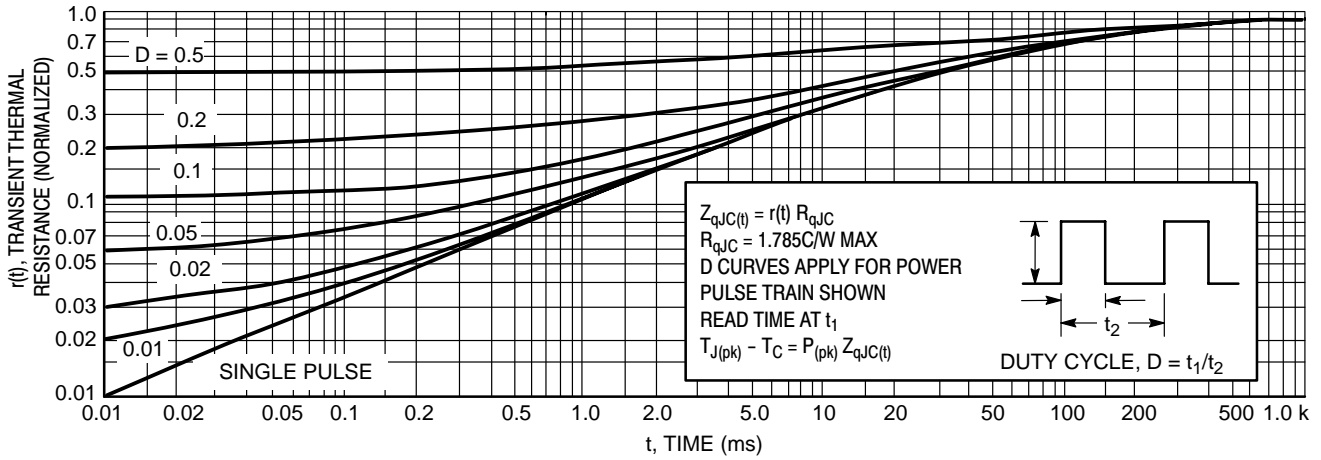


Figure 1. Thermal Response

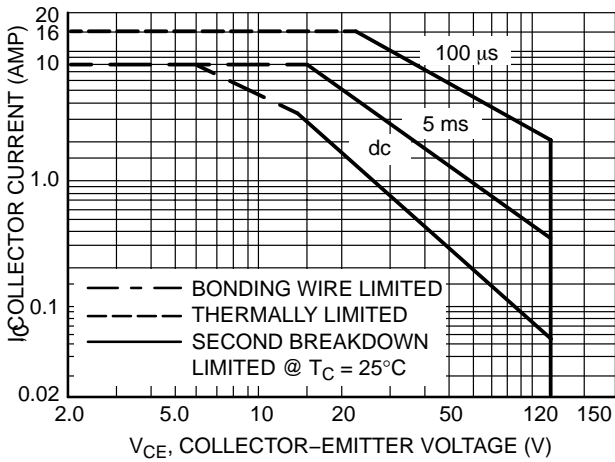


Figure 2. Forward Bias Safe Operating Area

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.

The data of Figures 2 is based on $T_{J(pk)} = 150^\circ C$; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} < 150^\circ C$. $T_{J(pk)}$ may be calculated from the data in Figure 1. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

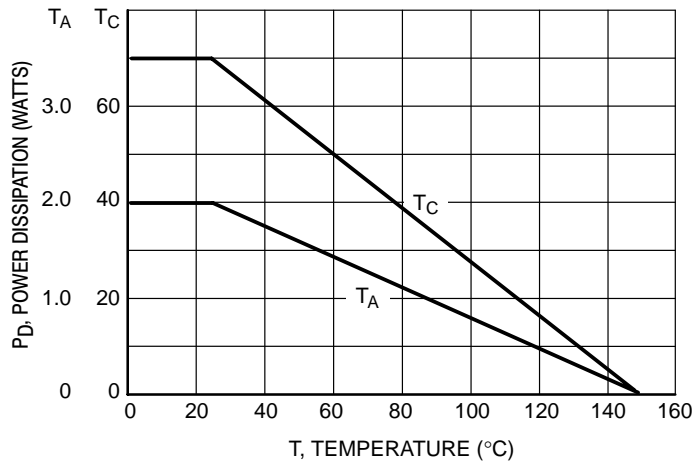
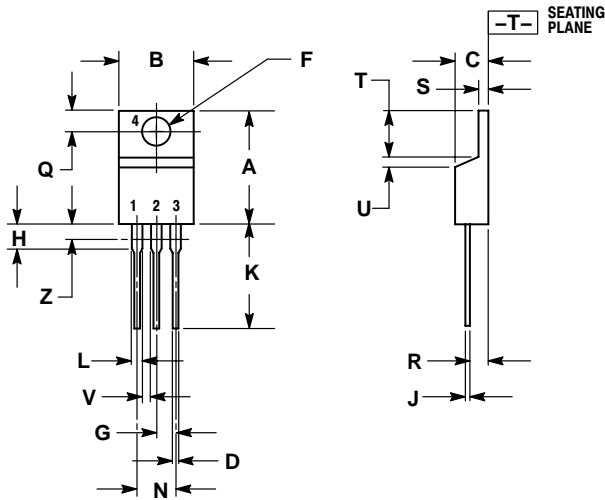


Figure 3. Power Derating

BUV27

PACKAGE DIMENSIONS

TO-220AB CASE 221A-09 ISSUE AA



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	---	1.15	---
Z	---	0.080	---	2.04

STYLE 1:

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

ON Semiconductor and are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

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.