BD241C (NPN), BD242B (PNP), BD242C (PNP)

BD241C and BD242C are Preferred Devices

Complementary Silicon Plastic Power Transistors

Designed for use in general purpose amplifier and switching applications.

Features

- Collector−Emitter Saturation Voltage − V_{CE} = 1.2 Vdc (Max) @ I_C = 3.0 Adc
- Collector−Emitter Sustaining Voltage − $V_{CEO(sus)}$ = 100 Vdc (Min) BD241C, BD242C
- High Current Gain − Bandwidth Product f_T = 3.0 MHz (Min) @ I_C = 500 mAdc
- Compact TO−220 AB Package
- Epoxy Meets UL94 V−0 @ 0.125 in
- ESD Ratings: Human Body Model, 3B > 8000 V; Machine Model, C > 400 V
- Pb−Free Packages are Available*

MAXIMUM RATINGS

Rating	Symbol	BD242B	BD241C BD242C	Unit
Collector−Emitter Voltage	V_{CEO}	80	100	Vdc
Collector−Emitter Voltage	V_{CES}	90	115	Vdc
Emitter−Base Voltage	V_{EB}	5.0		Vdc
Collector Current Continuous Peak	I_C	3.0 5.0		Adc
Base Current	I_B	1.0		Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	40 0.32		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−Ambient	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	3.125	°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.

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

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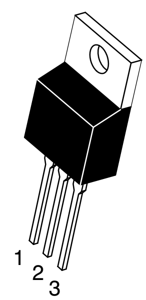
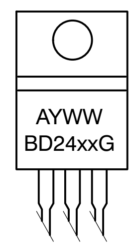
http://onsemi.com

POWER TRANSISTORS COMPLEMENTARY SILICON 3 AMP 80−100 VOLTS 40 WATTS



TO−220AB CASE 221A−09 STYLE 1

MARKING DIAGRAM



BD24xx	=	Device Code xx = 1C, 2B, or 2C
A	=	Assembly Location
Y	=	Year
WW	=	Work Week
G	=	Pb−Free Package

ORDERING INFORMATION

Device	Package	Shipping
BD241C	TO−220AB	50 Units/Rail
BD241CG	TO−220AB (Pb−Free)	50 Units/Rail
BD242B	TO−220AB	50 Units/Rail
BD242BG	TO−220AB (Pb−Free)	50 Units/Rail
BD242C	TO−220AB	50 Units/Rail
BD242CG	TO−220AB (Pb−Free)	50 Units/Rail

Preferred devices are recommended choices for future use and best overall value.

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)	 BD242B BD241C, BD242C	V_{CEO}	 80 100		Vdc
Collector Cutoff Current (V_{CE} = 50 Vdc, I_B = 0) (V_{CE} = 60 Vdc, I_B = 0)	 BD242B BD241C, BD242C	I_{CEO}		0.3	mAdc
Collector Cutoff Current (V_{CE} = 80 Vdc, V_{EB} = 0) (V_{CE} = 100 Vdc, V_{EB} = 0)	 BD242B BD241C, BD242C	I_{CES}		200	μAdc
Emitter Cutoff Current (V_{BE} = 5.0 Vdc, I_C = 0)		I_{EBO}		1.0	mAdc
ON CHARACTERISTICS (Note 1)					
DC Current Gain (I_C = 1.0 Adc, V_{CE} = 4.0 Vdc) (I_C = 3.0 Adc, V_{CE} = 4.0 Vdc)		h_{FE}	 25 10		
Collector−Emitter Saturation Voltage (I_C = 3.0 Adc, I_B = 0.6 Adc)		$V_{CE(sat)}$		1.2	Vdc
Base−Emitter On Voltage (I_C = 3.0 Adc, V_{CE} = 4.0 Vdc)		$V_{BE(on)}$		1.8	Vdc
DYNAMIC CHARACTERISTICS					
Current Gain − Bandwidth Product (Note 2) (I_C = 500 mAdc, V_{CE} = 10 Vdc, f_{test} = 1.0 MHz)		f_T	3.0		MHz
Small−Signal Current Gain (I_C = 0.5 Adc, V_{CE} = 10 Vdc, f = 1.0 kHz)		h_{fe}	20		

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
2. $f_T = |h_{fe}| \bullet f_{test}$.

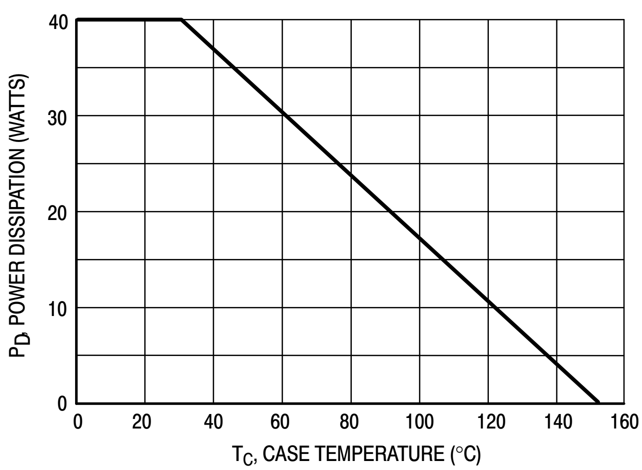


Figure 1. Power Derating

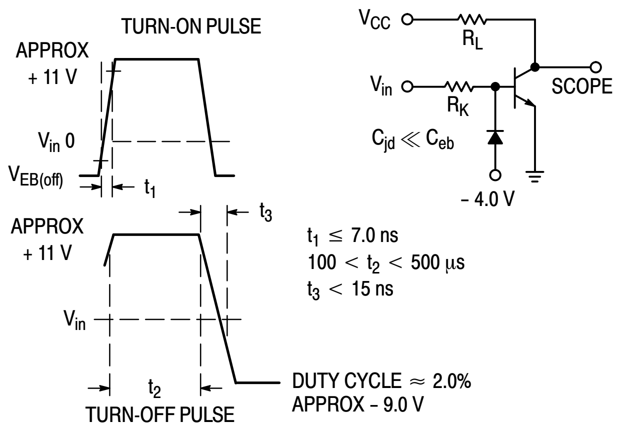


Figure 2. Switching Time Equivalent Circuit

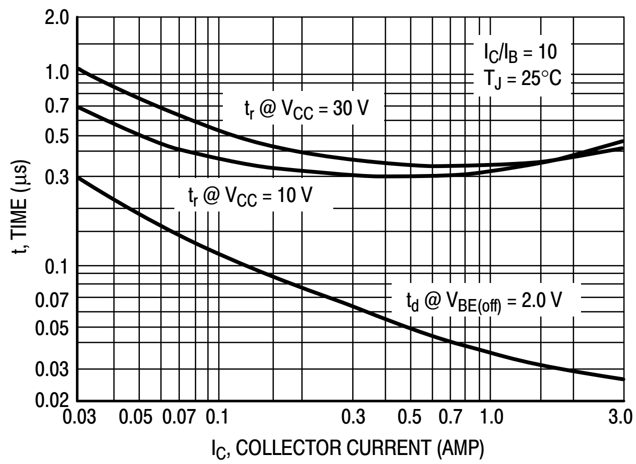


Figure 3. Turn−On Time

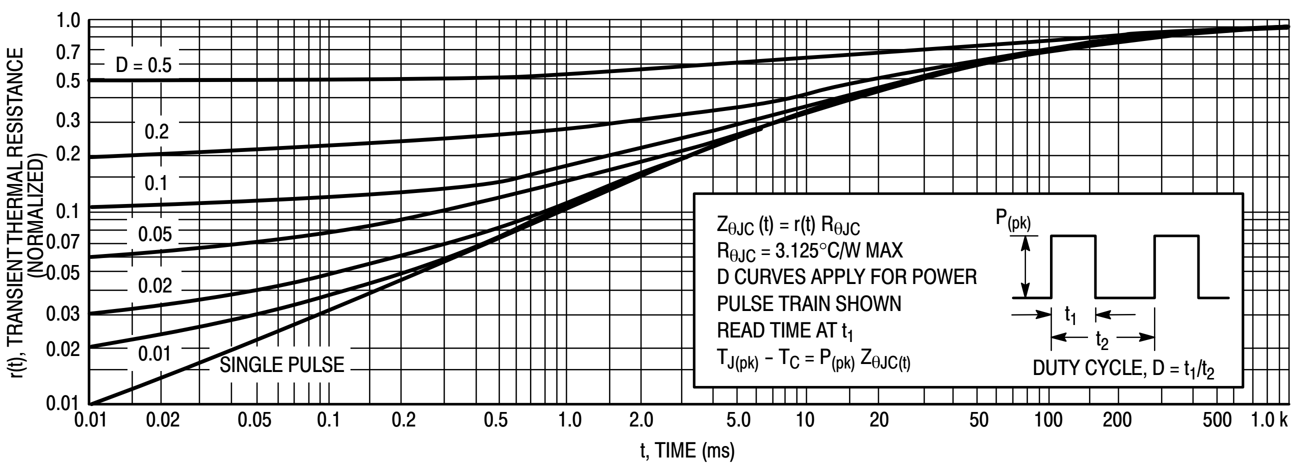


Figure 4. Thermal Response

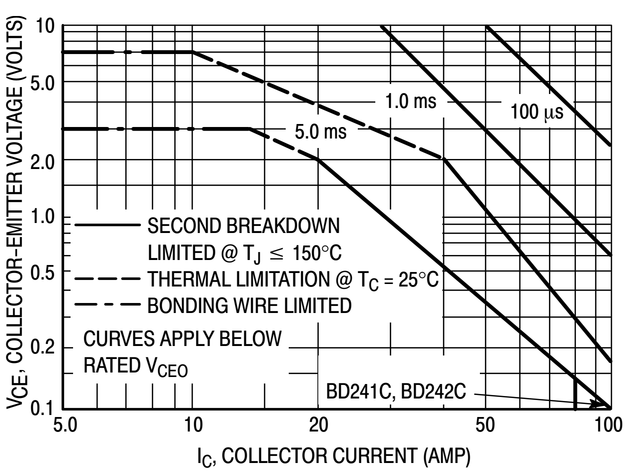


Figure 5. Active Region Safe Operating Area

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 5 is based on $T_{J(pk)} = 150°C$; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150°C$, $T_{J(pk)}$ may be calculated from the data in Figure 4. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

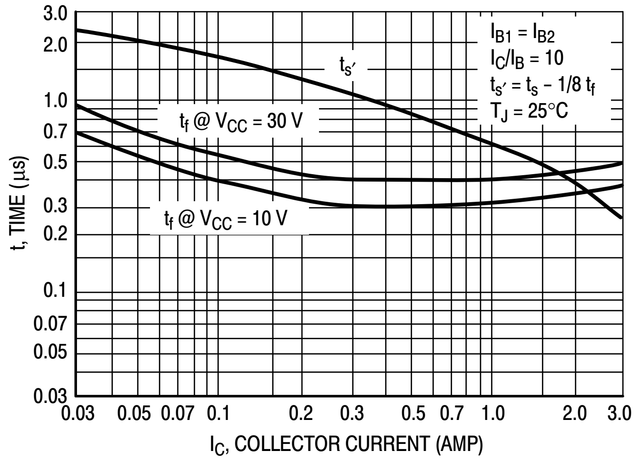


Figure 6. Turn−Off Time

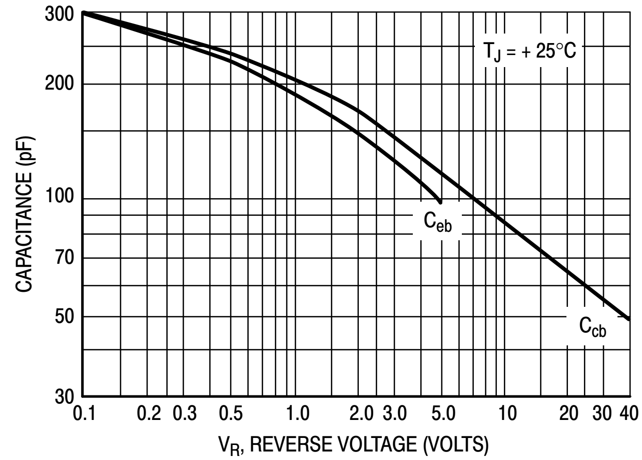


Figure 7. Capacitance

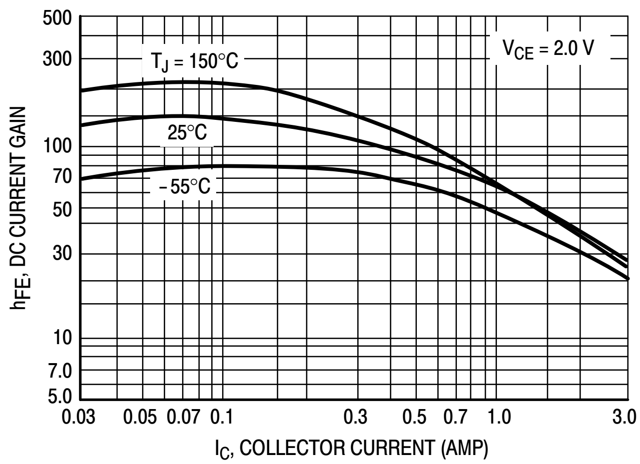


Figure 8. DC Current Gain

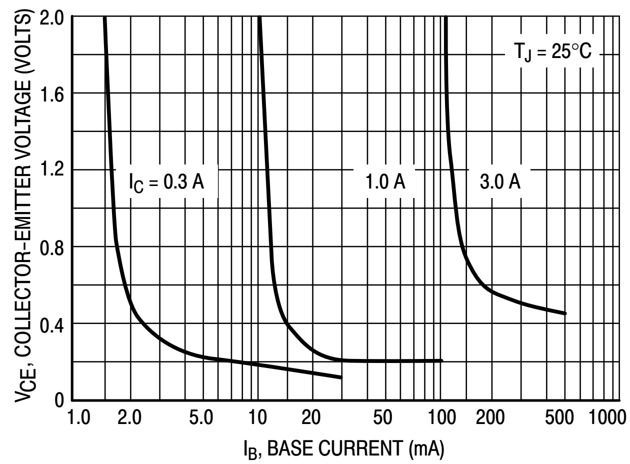


Figure 9. Collector Saturation Region

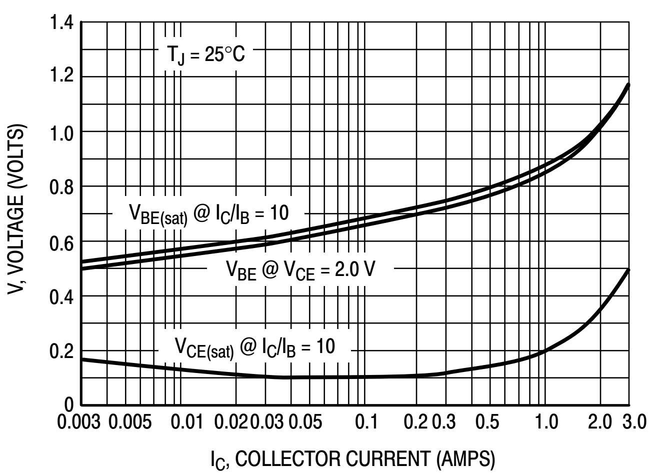


Figure 10. “On” Voltages

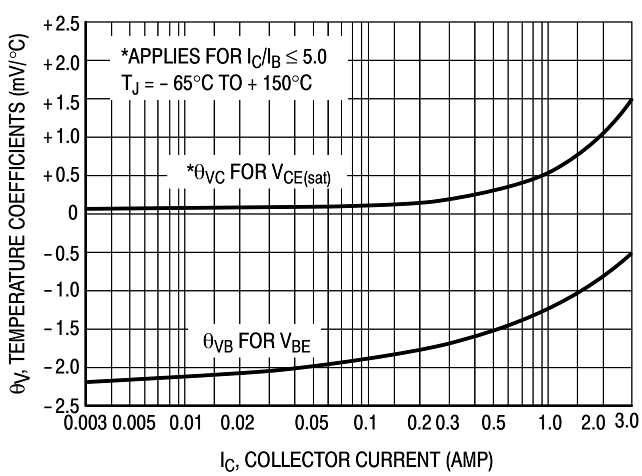


Figure 11. Temperature Coefficients

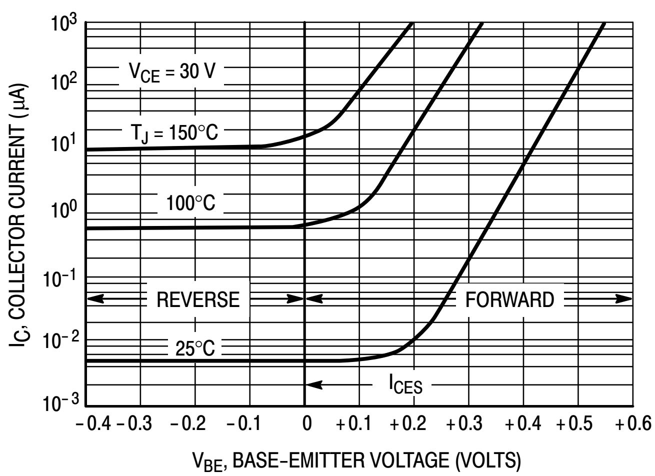


Figure 12. Collector Cut−Off Region

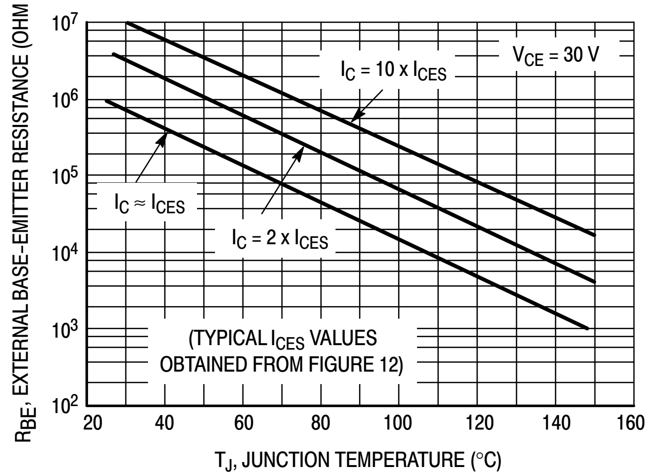
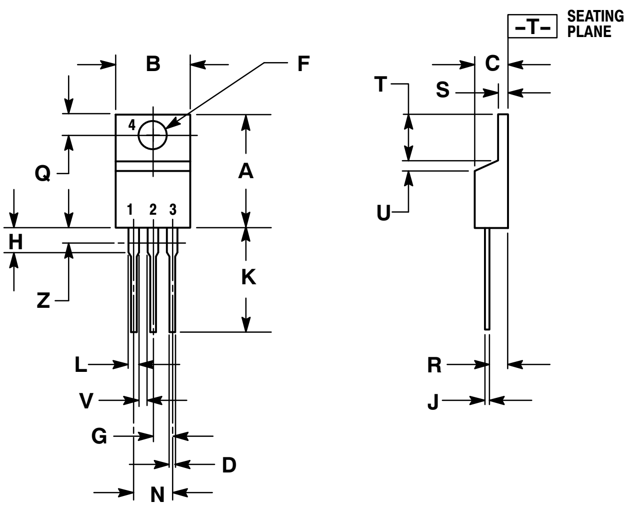


Figure 13. Effects of Base−Emitter Resistance

PACKAGE DIMENSIONS

TO−220
CASE 221A−09
ISSUE AE



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.

	INCHES		MILLIMETERS	
DIM	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	0.161	3.61	4.09
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.014	0.025	0.36	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

PUBLICATION ORDERING INFORMATION

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