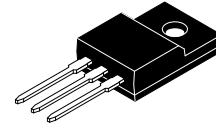


Bipolar Transistor

50 V, 15 A, Low $V_{CE(sat)}$,
 NPN TO-220F-3SG

2SC6082



TO-220 Fullpack, 3-Lead /
 TO-220F-3SG
 CASE 221AT

Features

- Adoption of MBIT Process
- Low Collector-to-Emitter Saturation Voltage
- Large Current Capacitance
- High-Speed Switching
- This is a Pb-Free Device

Applications

- High-Speed Switching Applications (Switching Regulator, Driver Circuit)

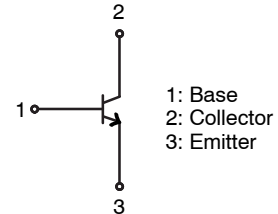
Specifications

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

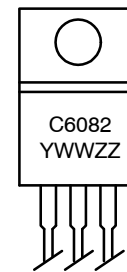
Symbol	Rating	Condition	Value	Unit
V_{CBO}	Collector-to-Base Voltage		60	V
V_{CES}	Collector-to-Emitter Voltage		60	V
V_{CEO}			50	V
V_{EBO}	Emitter-to-Base Voltage		6	V
I_C	Collector Current		15	A
I_{CP}	Collector Current (Pulse)	$PW \leq 10 \mu s$, duty cycle $\leq 1\%$	20	A
I_B	Base Current		3	A
P_C	Collector Dissipation		2	mW
		$T_C = 25^\circ C$	23	mW
T_j	Junction Temperature		150	°C
T_{stg}	Storage Temperature		-55 to +150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

ELECTRICAL CONNECTION



MARKING DIAGRAM



C6082 = Device Code
 YWW = Date Code (Year & Week)
 ZZ = Assembly Lot

ORDERING INFORMATION

Device	Package	Shipping
2SC6082-1E	TO-220F (Pb-Free)	50 / Tube

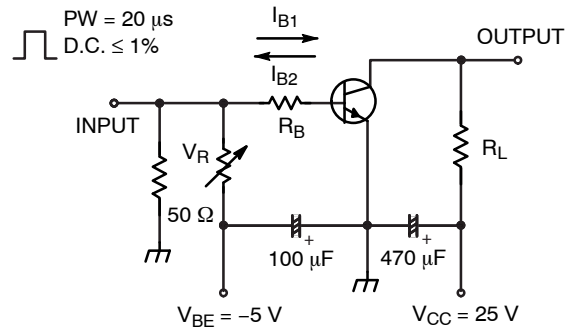
2SC6082

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{CBO}	Collector Cutoff Current	$V_{CB} = 40\text{ V}, I_E = 0\text{ A}$	-	-	10	μA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = 4\text{ V}, I_C = 0\text{ A}$	-	-	10	μA
H_{FE1}	DC Current Gain	$V_{CE} = 2\text{ V}, I_C = 330\text{ mA}$	200	-	560	
H_{FE2}		$V_{CE} = 2\text{ V}, I_C = 10\text{ A}$	50	-	-	
f_T	Gain-Bandwidth Product	$V_{CE} = 10\text{ V}, I_C = 2\text{ A}$	-	195	-	MHz
C_{ob}	Output Capacitance	$V_{CB} = 10\text{ V}, f = 1\text{ MHz}$	-	85	-	pF
$V_{CE(sat)}$	Collector-to-Emitter Saturation Voltage	$I_C = 7.5\text{ mA}, I_B = 375\text{ mA}$	-	200	400	mV
$V_{BE(sat)}$	Base-to-Emitter Saturation Voltage	$I_C = 7.5\text{ mA}, I_B = 375\text{ mA}$	-	-	1.2	V
$V_{(BR)CBO}$	Collector-to-Base Breakdown Voltage	$I_C = 100\ \mu\text{A}, I_E = 0\text{ A}$	60	-	-	V
$V_{(BR)CES}$	Collector-to-Emitter Breakdown Voltage	$I_C = 100\ \mu\text{A}, R_{BE} = 0\ \Omega$	60	-	-	V
$V_{(BR)CEO}$		$I_C = 1\text{ mA}, R_{BE} = \infty$	50	-	-	V
$V_{(BR)EBO}$	Emitter-to-Base Breakdown Voltage	$I_E = 100\ \mu\text{A}, I_C = 0\text{ A}$	5	-	-	V
t_{on}	Turn-On Time	See specified Test Circuit		52	-	ns
t_{stg}	Storage Time			560	-	ns
t_f	Fall Time			37	-	ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

Switching Time Test Circuit



$$I_C = 20I_{B1} = -20I_{B2} = 5\text{ A}$$

Figure 1. Switching Time Test Circuit

TYPICAL CHARACTERISTICS

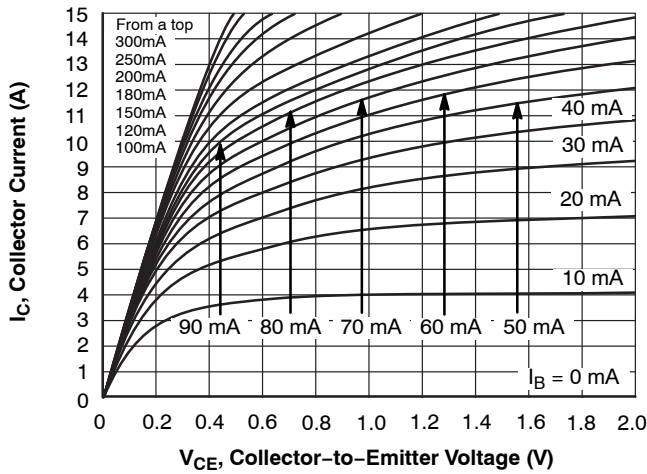


Figure 2. $I_C - V_{CE}$

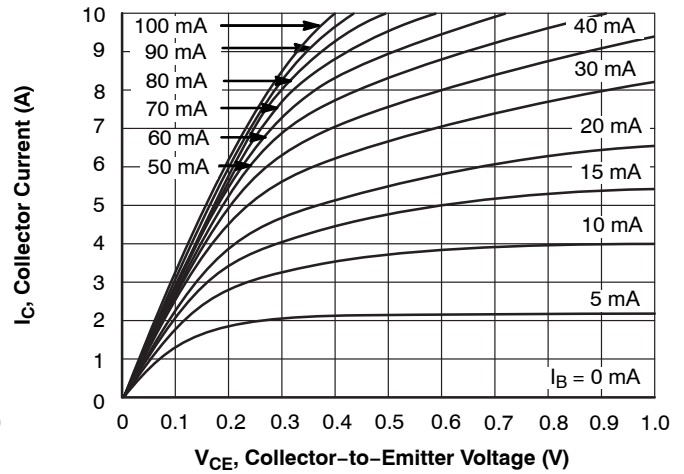


Figure 3. $I_C - V_{CE}$

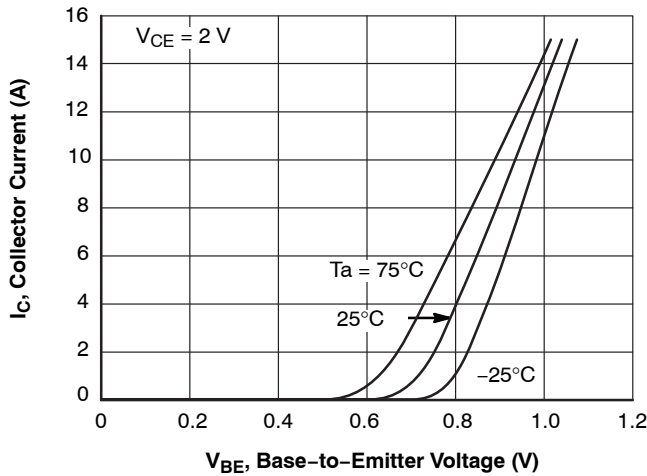


Figure 4. $I_C - V_{BE}$

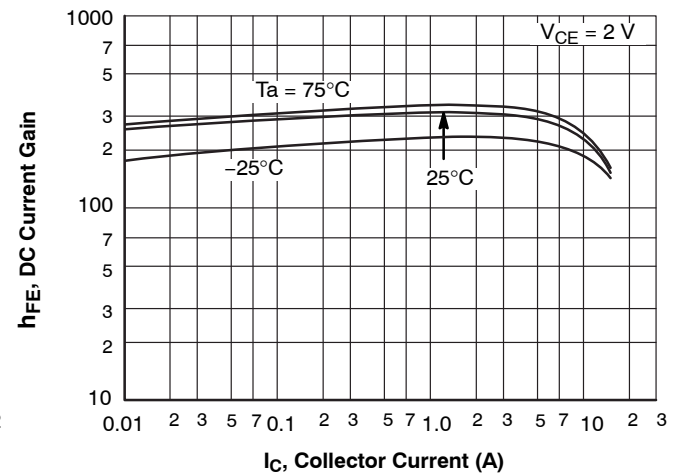


Figure 5. $h_{FE} - I_C$

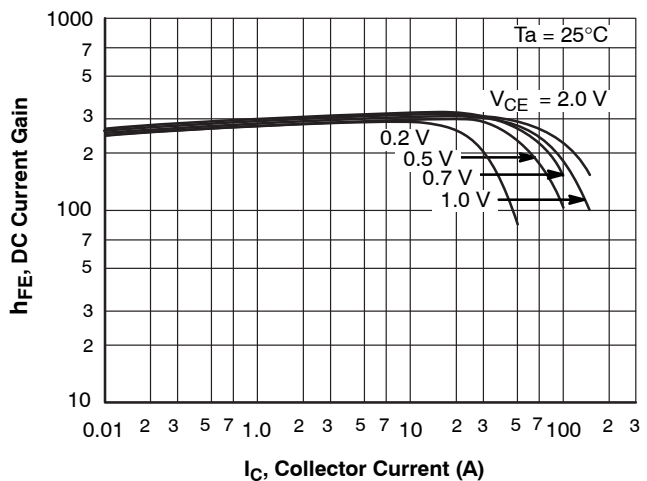


Figure 6. $h_{FE} - I_C$

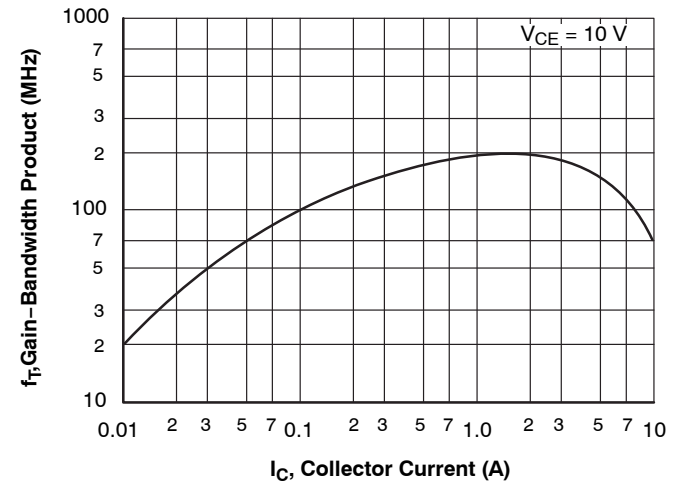


Figure 7. $F_T - I_C$

TYPICAL CHARACTERISTICS (continued)

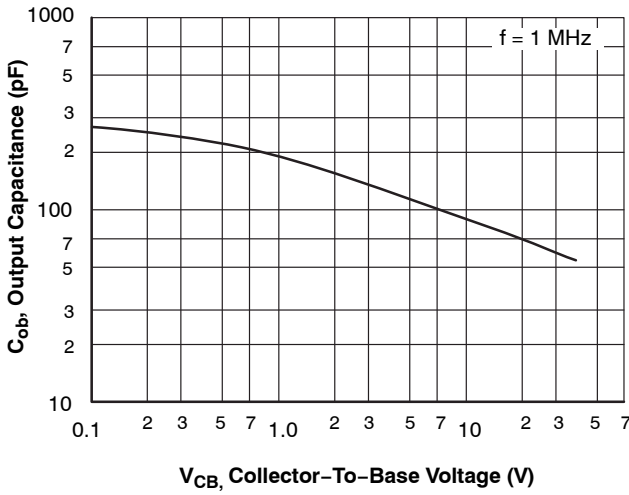


Figure 8. $C_{ob} - V_{CB}$

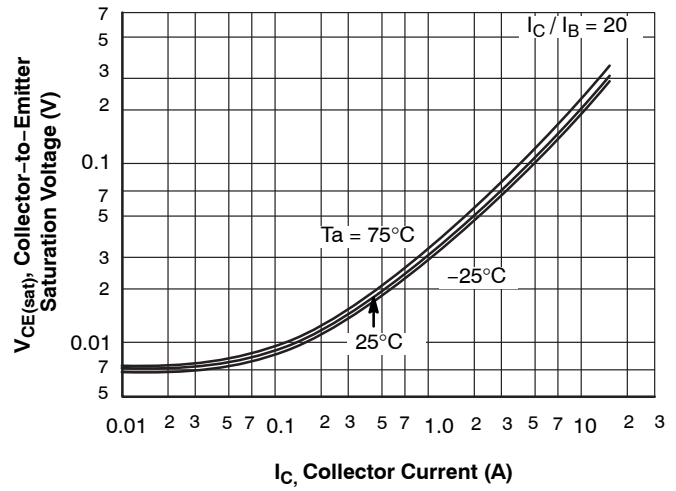


Figure 9. $V_{CE(sat)} - I_C$

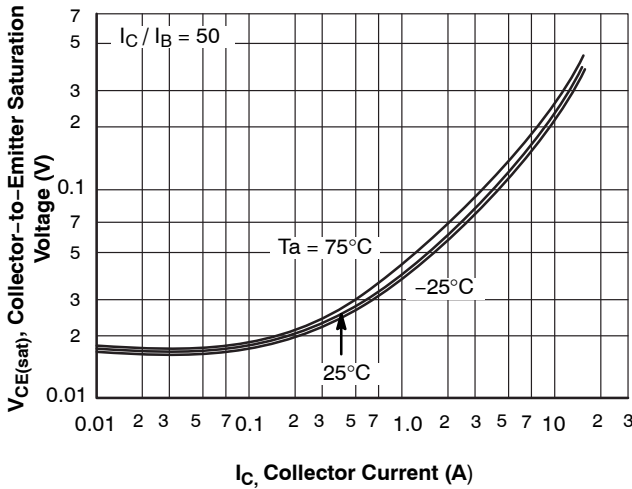


Figure 10. $V_{CE(sat)} - I_C$

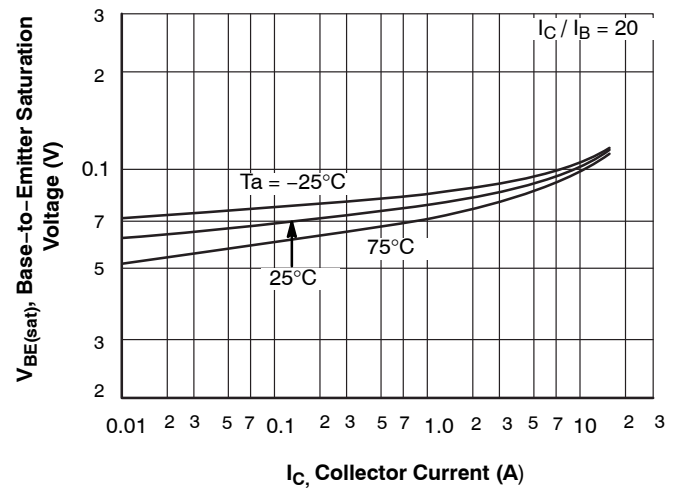


Figure 11. $V_{BE(sat)} - I_C$

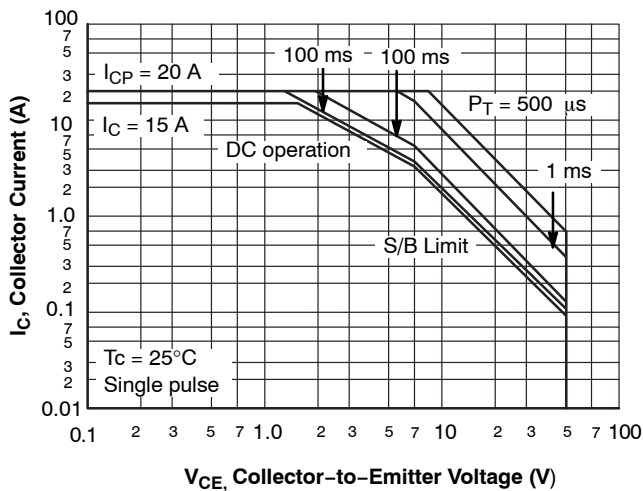


Figure 12. Forward Bias ASO

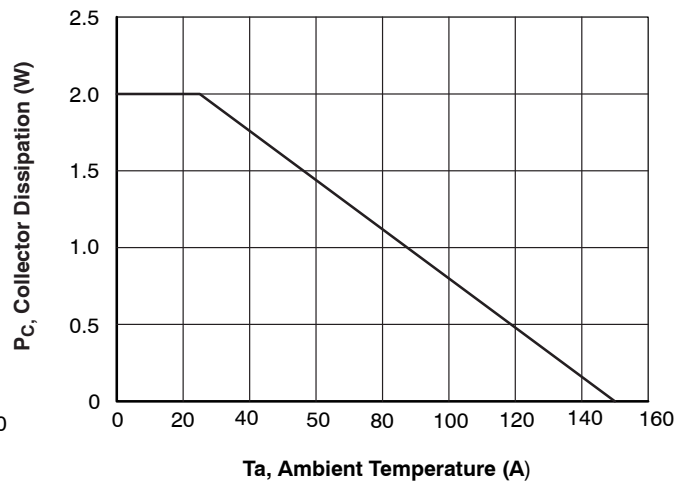


Figure 13. $P_C - T_a$

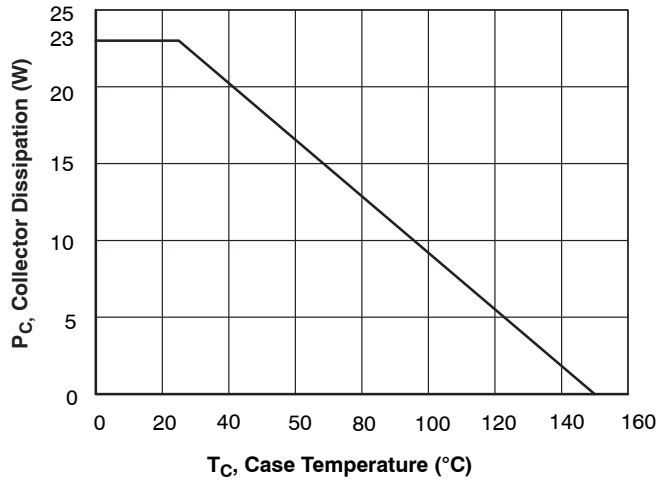


Figure 14. P_C - T_C

MECHANICAL CASE OUTLINE

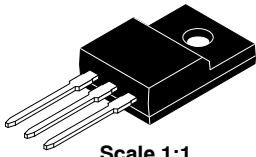
PACKAGE DIMENSIONS

ON Semiconductor®

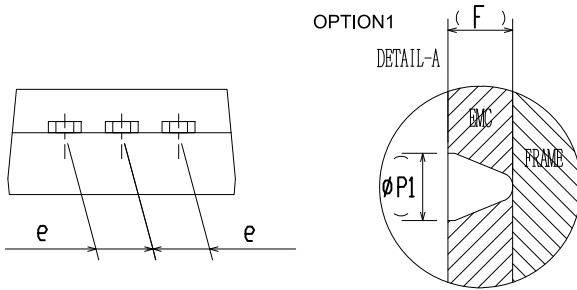
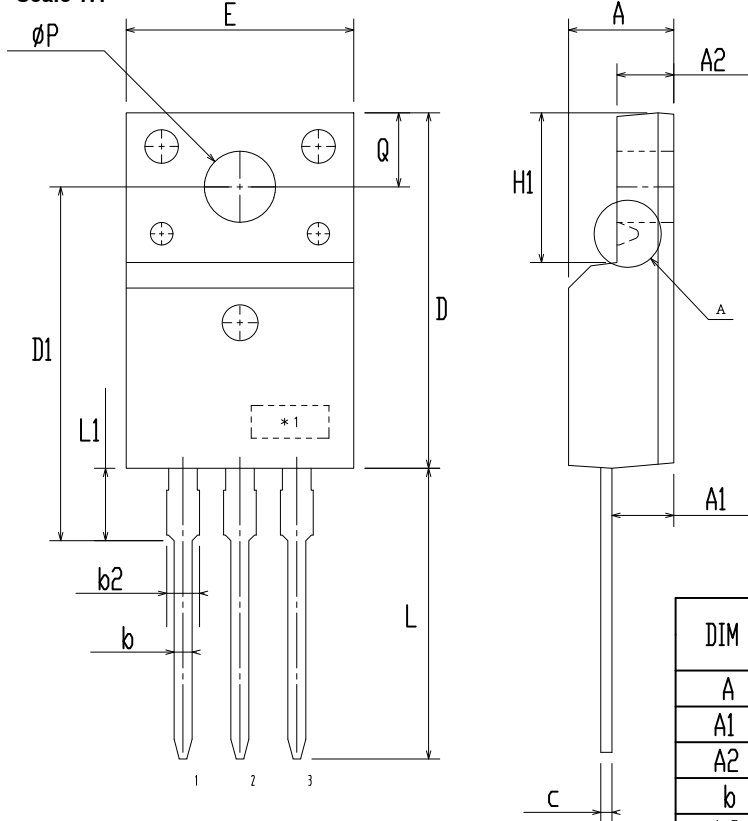


TO-220 Fullpack, 3-Lead / TO-220F-3SG CASE 221AT ISSUE B

DATE 19 JAN 2021



Scale 1:1



DIM	MILLIMETERS		
	MIN	NOM	MAX
A	4.50	4.70	4.90
A1	2.56	2.76	2.96
A2	2.34	2.54	2.74
b	0.70	0.80	0.90
b2	~	~	1.47
c	0.45	0.50	0.60
D	15.67	15.87	16.07
D1	15.60	15.80	16.00
E	9.96	10.16	10.36
e	2.34	2.54	2.74
F	~	0.84	~
H1	6.48	6.68	6.88
L	12.78	12.98	13.18
L1	3.03	3.23	3.43
phi P	2.98	3.18	3.38
phi P1	~	1.00	~
Q	3.20	3.30	3.40

NOTES:

- A. DIMENSION AND TOLERANCE AS ASME Y14.5-2009
- B. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUCTIONS.
- C. OPTION 1 - WITH SUPPORT PIN HOLE
OPTION 2 - NO SUPPORT PIN HOLE

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