MJW18020

Preferred Devices

NPN Silicon Power Transistors High Voltage Planar

The MJW18020 planar High Voltage Power Transistor is specifically Designed for motor control applications, high power supplies and UPS's for which the high reproducibility of DC and Switching parameters minimizes the dead time in bridge configurations.

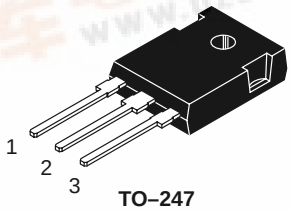
Mains features include:

- High and Excellent Gain Linearity
- Fast and Very Tight Switching Times Parameters t_{si} and t_{fi}
- Very Stable Leakage Current due to the Planar Structure
- High Reliability

ON Semiconductor™

http://onsemi.com

30 AMPERES
1000 VOLTS BV_{CES}
450 VOLTS BV_{CEO}
250 WATTS



TO–247
CASE 340K
STYLE 3

MAXIMUM RATINGS

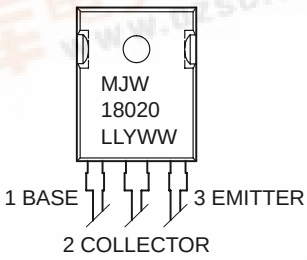
Rating	Symbol	Value	Unit
Collector–Emitter Sustaining Voltage	V_{CEO}	450	Vdc
Collector–Base Breakdown Voltage	V_{CES}	1000	Vdc
Collector–Base Voltage	V_{CBO}	1000	Vdc
Emitter–Base Voltage	V_{EBO}	9.0	Vdc
Collector Current – Continuous – Peak (Note 1.)	I_C	30 45	Adc
Base Current – Continuous – Peak (Note 1.)	I_B	6.0 10	Adc
Total Power Dissipation @ T_C = 25°C Derate Above 25°C	P_D	250 2.0	Watts 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	$R_{\theta JC}$	0.5	°C/W
Thermal Resistance, Junction–to–Ambient	$R_{\theta JA}$	50	°C/W
Maximum Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds	T_L	275	°C

1. Pulse Test: Pulse Width = 5 μs, Duty Cycle ≤ 10%.

MARKING DIAGRAM



MJW18020= Device Code
LL = Location Code
Y = Year
WW = Work Week

ORDERING INFORMATION

Device	Package	Shipping
MJW18020	TO–247	30 Units/Rail

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

Publication Order Number:

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Sustaining Voltage (I_C = 100 mAdc, I_B = 0)	$V_{CEO(sus)}$	450	–	–	Vdc
Collector Cutoff Current (V_{CE} = Rated V_{CEO}, I_B = 0)	I_{CEO}	–	–	100	μAdc
Collector Cutoff Current (V_{CE} = Rated V_{CES}, V_{EB} = 0)	I_{CES}	–	–	100	μAdc
(T_C = 125°C)				500	
Emitter Cutoff Current (V_{CE} = 9 Vdc, I_C = 0)	I_{EBO}	–	–	100	μAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 3 Adc, V_{CE} = 5 Vdc)	h_{FE}	14		34	
(T_C = 125°C)		–	30	–	
(I_C = 10 Adc V_{CE} = 2 Vdc)		8	16		
(T_C = 125°C)		5	14	–	
(I_C = 20 Adc V_{CE} = 2 Vdc)		5.5	9	–	
(T_C = 125°C)		4	7	–	
(I_C = 10 mAdc V_{CE} = 5 Vdc)		14	25	–	
Base–Emitter Saturation Voltage (I_C = 10 Adc, I_B = 2 Adc)	$V_{BE(sat)}$	–	0.97	1.25	Vdc
(I_C = 20 Adc, I_B = 4 Adc)			1.15	1.5	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$				Vdc
(I_C = 10 Adc, I_B = 2 Adc)		–	0.2	0.6	
(T_C = 125°C)		–	0.3	–	
(I_C = 20 Adc, I_B = 4 Adc)		–	0.5	1.5	
(T_C = 125°C)		–	0.9	2.0	
DYNAMIC CHARACTERISTICS					
Current Gain Bandwidth Product (I_C = 1 Adc, V_{CE} = 10 Vdc, f_{test} = 1 MHz)	f_T	–	13	–	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f_{test} = 1 MHz)	C_{ob}	–	300	500	pF
Input Capacitance (V_{EB} = 8.0)	C_{ib}	–	7000	9000	pF
SWITCHING CHARACTERISTICS: Resistive Load (D.C. = 10%, Pulse Width = 70 μs)					
Turn–On Time (I_C = 10 Adc, I_{B1} = I_{B2} = 2 Adc, Vcc = 125 V)	t_{On}	–	540	750	ns
Storage Time	t_s	–	4.75	6	μs
Fall Time	t_f	–	380	500	ns
Turn–Off Time	t_{Off}	–	5.2	6.5	μs
Turn–On Time (I_C= 20 Adc, I_{B1} = I_{B2} = 4 Adc, Vcc = 125 V)	t_{On}	–	965	1200	ns
Storage Time	t_s	–	2.9	3.5	μs
Fall Time	t_f	–	350	500	ns
Turn–Off Time	t_{Off}	–	3.25	4	μs
SWITCHING CHARACTERISTICS: Inductive Load (V_{clamp}= 300 V , Vcc = 15 V, L = 200 μH)					
Fall Time (I_C = 10 Adc, I_{B1} = I_{B2} = 2 Adc)	t_{fi}	–	142	250	ns
Storage Time	t_{si}	–	4.75	6	μs
Crossover Time	t_c	–	320	500	ns
Fall Time (I_C = 20 Adc, I_{B1} = I_{B2} = 4 Adc)	t_{fi}	–	350	500	ns
Storage Time	t_{si}	–	3.0	3.5	μs
Crossover Time	t_c	–	500	750	ns

TYPICAL CHARACTERISTICS

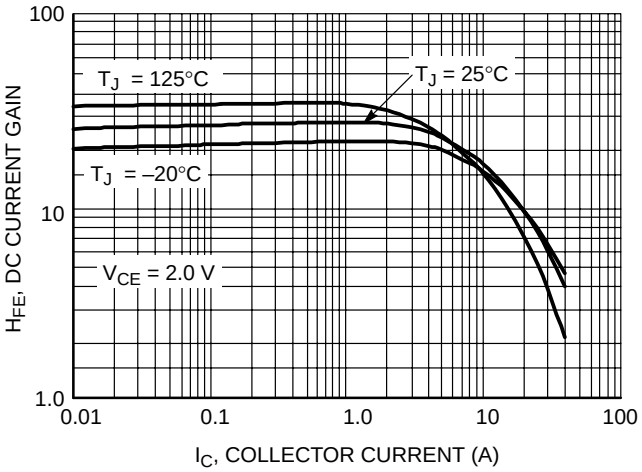


Figure 1. DC Current Gain, V_{CE} = 2.0 V

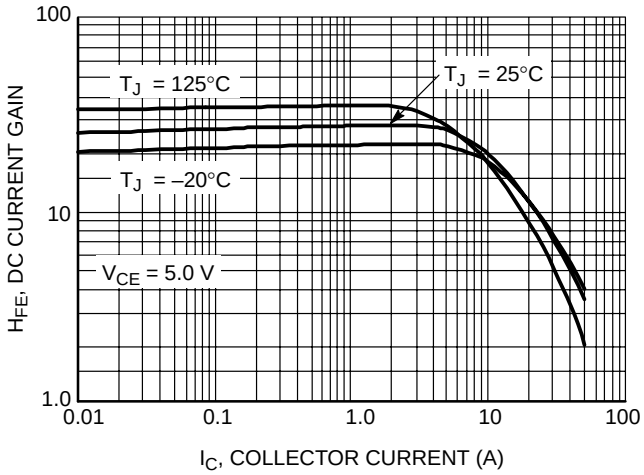


Figure 2. DC Current Gain, V_{CE} = 5.0 V

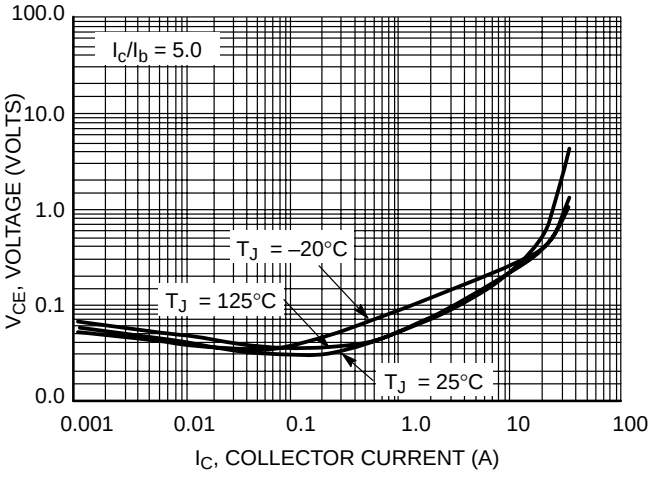


Figure 3. Typical Collector–Emitter Saturation Voltage, I_C/I_B = 5.0

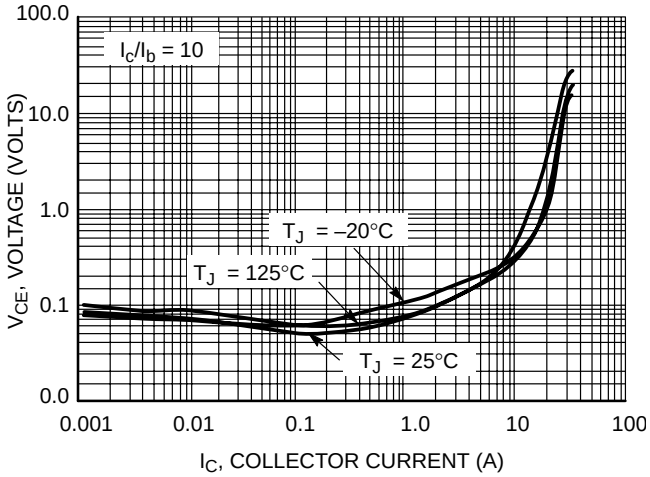


Figure 4. Typical Collector–Emitter Saturation Voltage, I_C/I_B = 10

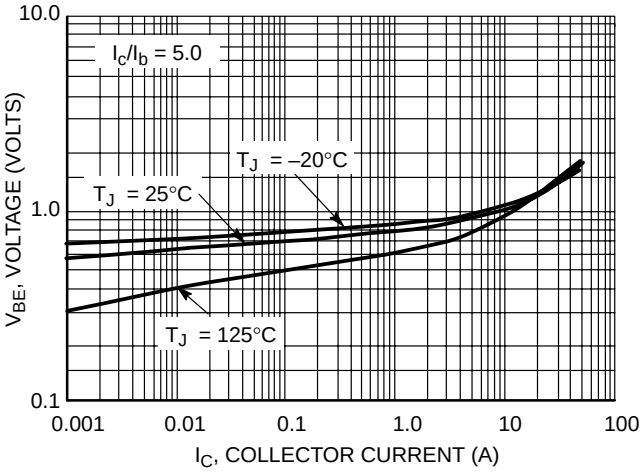


Figure 5. Typical Base–Emitter Saturation Voltage, I_C/I_B = 5.0

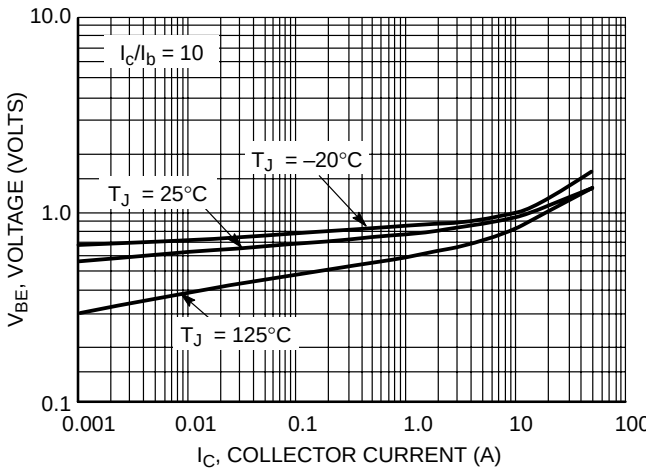


Figure 6. Typical Base–Emitter Saturation Voltage, I_C/I_B = 10

TYPICAL CHARACTERISTICS

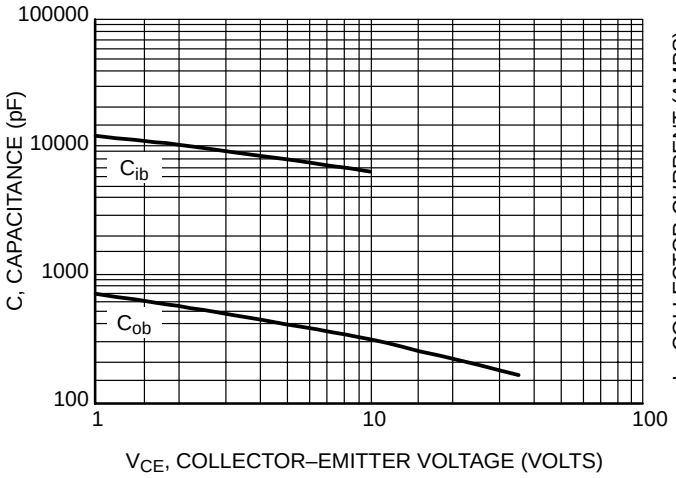


Figure 7. Typical Capacitance

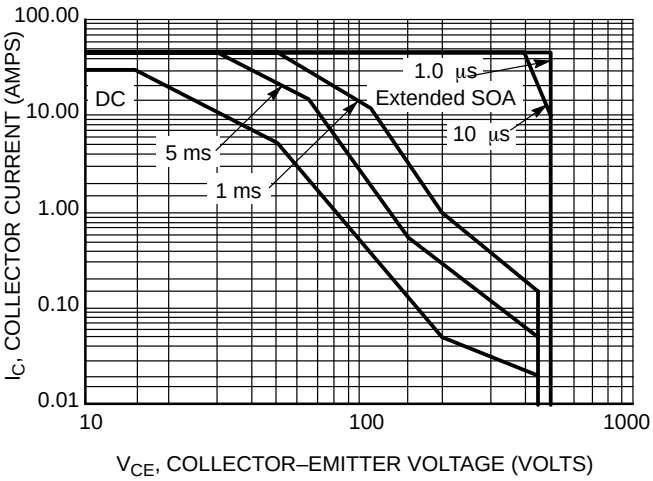


Figure 8. Forward Bias Safe Operating Area

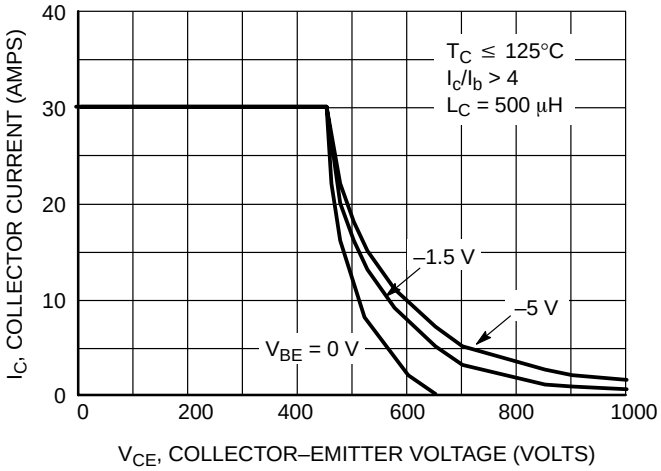
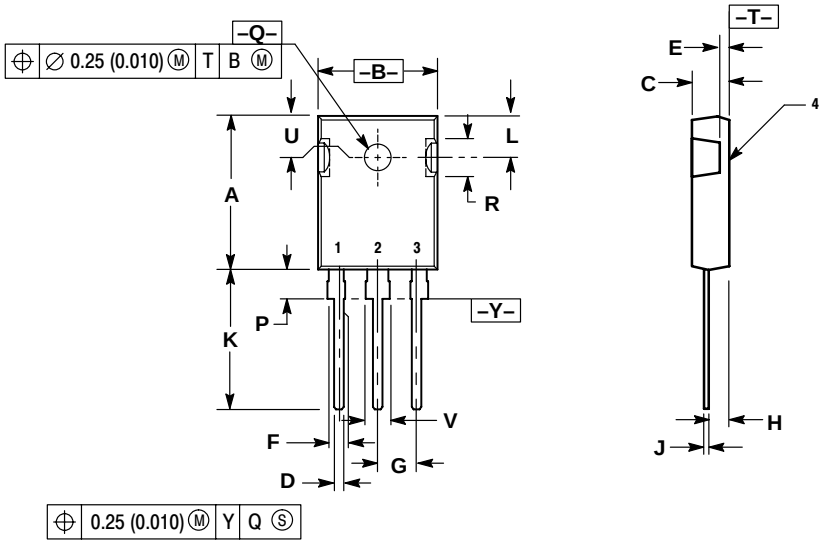


Figure 9. Reverse Bias Safe Operating Area

MJW18020

PACKAGE DIMENSIONS

TO–247
CASE 340K–01
ISSUE C



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

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	19.7	20.3	0.776	0.799
B	15.3	15.9	0.602	0.626
C	4.7	5.3	0.185	0.209
D	1.0	1.4	0.039	0.055
E	1.27 REF		0.050 REF	
F	2.0	2.4	0.079	0.094
G	5.5 BSC		0.216 BSC	
H	2.2	2.6	0.087	0.102
J	0.4	0.8	0.016	0.031
K	14.2	14.8	0.559	0.583
L	5.5 NOM		0.217 NOM	
P	3.7	4.3	0.146	0.169
Q	3.55	3.65	0.140	0.144
R	5.0 NOM		0.197 NOM	
U	5.5 BSC		0.217 BSC	
V	3.0	3.4	0.118	0.134

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

Notes

Notes

PUBLICATION ORDERING INFORMATION

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