

MPS6717

One Watt Amplifier Transistor

NPN Silicon

Features

- Pb-Free Packages are Available*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	80	Vdc
Collector-Base Voltage	V_{CB0}	80	Vdc
Emitter-Base Voltage	V_{EB0}	5.0	Vdc
Collector Current - Continuous	I_C	500	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	1.0 8.0	W mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	2.5 20	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	50	$^\circ\text{C}/\text{W}$

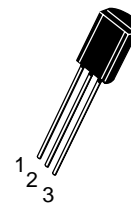
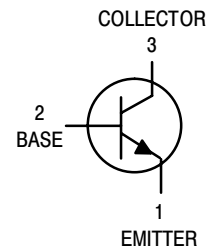
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

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



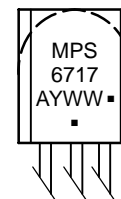
ON Semiconductor®

<http://onsemi.com>



TO-92 (TO-226)
CASE 29-10
STYLE 1

MARKING DIAGRAM



MPS6717 = Device Code
A = Assembly Location
Y = Year
WW = Work Week
■ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
MPS6717	TO-92	5000 Units / Bulk
MPS6717G	TO-92 (Pb-Free)	5000 Units / Bulk
MPS6717RLRA	TO-92	2000/Tape & Reel
MPS6717RLRAG	TO-92 (Pb-Free)	2000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MPS6717

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Breakdown Voltage (Note 1) (I _C = 1.0 mA, I _B = 0)	V _{(BR)CEO}	80	–	Vdc
Collector–Base Breakdown Voltage (I _C = 100 μA, I _E = 0)	V _{(BR)CBO}	80	–	Vdc
Emitter–Base Breakdown Voltage (I _E = 10 μA, I _C = 0)	V _{(BR)EBO}	5.0	–	Vdc
Collector Cutoff Current (V _{CB} = 60 Vdc, I _E = 0)	I _{CBO}	–	0.1	μA
Emitter Cutoff Current (V _{EB} = 5.0 Vdc, I _C = 0)	I _{EBO}	–	10	μA

ON CHARACTERISTICS

DC Current Gain (I _C = 50 mA, V _{CE} = 1.0 Vdc) (I _C = 250 mA, V _{CE} = 1.0 Vdc)	h _{FE}	80 50	– 250	–
Collector–Emitter Saturation Voltage (I _C = 250 mA, I _B = 10 mA)	V _{CE(sat)}	–	0.5	Vdc
Base–Emitter On Voltage (I _C = 250 mA, V _{CE} = 1.0 Vdc)	V _{BE(on)}	–	1.2	Vdc

SMALL-SIGNAL CHARACTERISTICS

Collector–Base Capacitance (V _{CB} = 10 Vdc, I _E = 0, f = 1.0 MHz)	C _{cb}	–	30	pF
Small–Signal Current Gain (I _C = 200 mA, V _{CE} = 5.0 Vdc, f = 20 MHz)	h _{fe}	2.5	25	–

1. Pulse Test: Pulse Width ≤ 300 μs; Duty Cycle ≤ 2.0%.

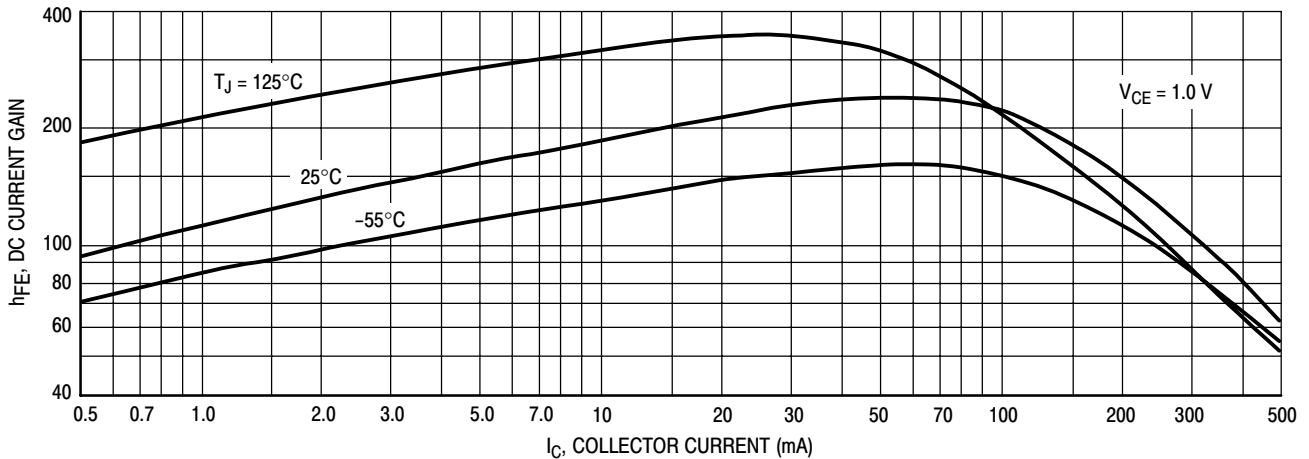


Figure 1. DC Current Gain

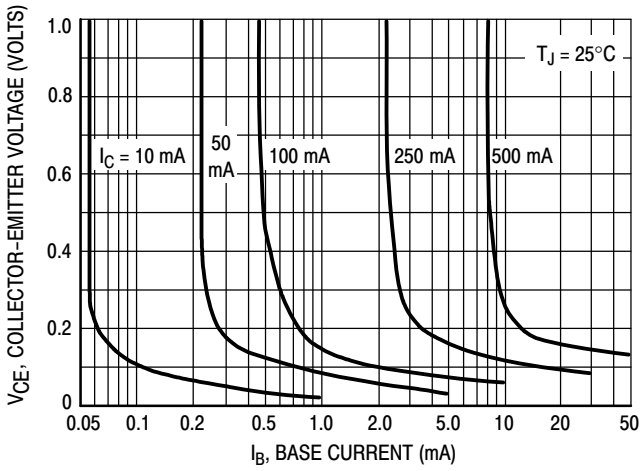


Figure 2. Collector Saturation Region

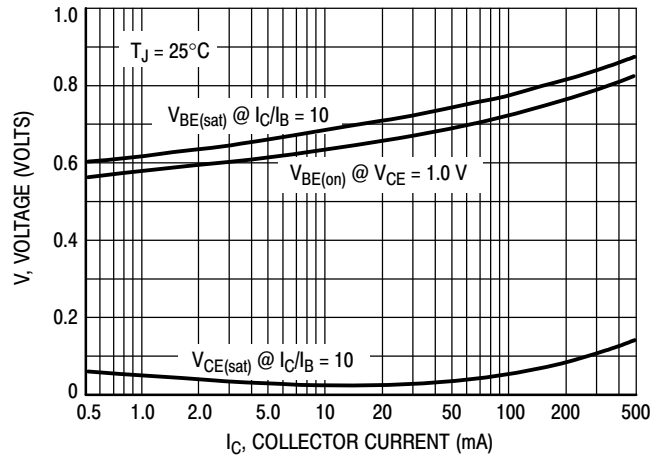


Figure 3. "On" Voltages

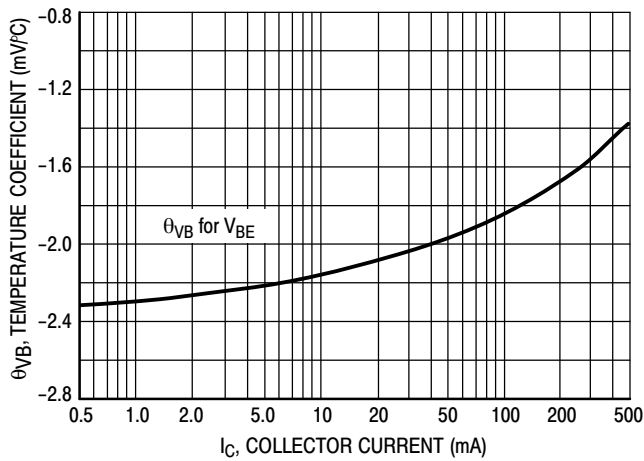


Figure 4. Base-Emitter Temperature Coefficient

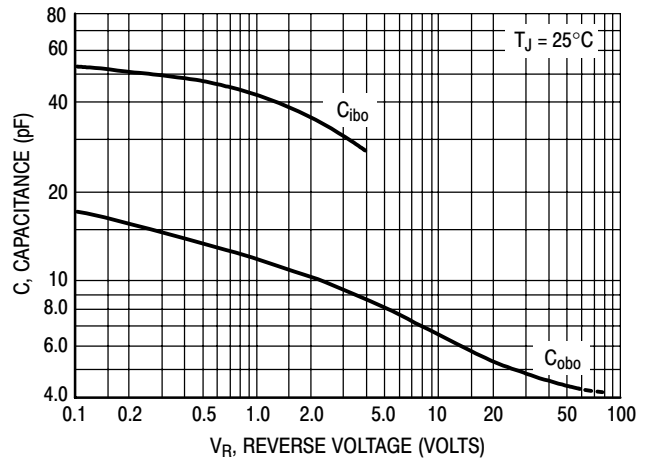


Figure 5. Capacitance

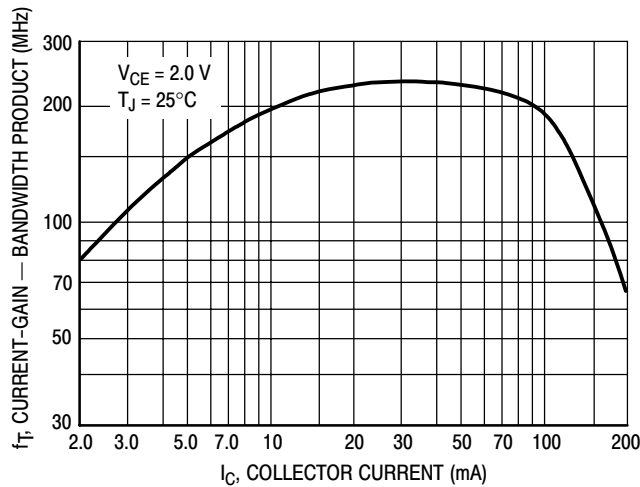


Figure 6. Current-Gain — Bandwidth Product

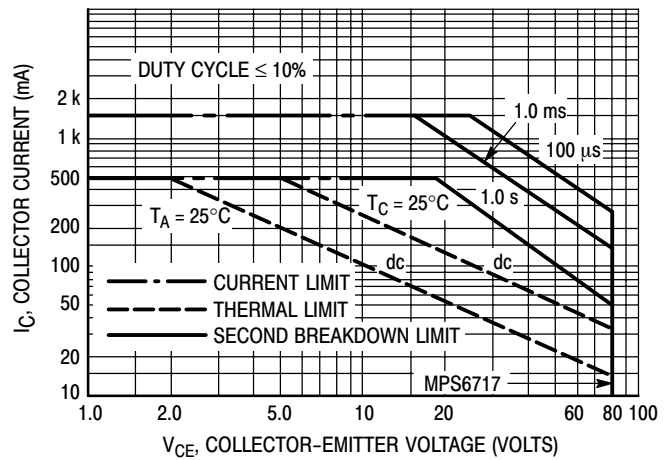
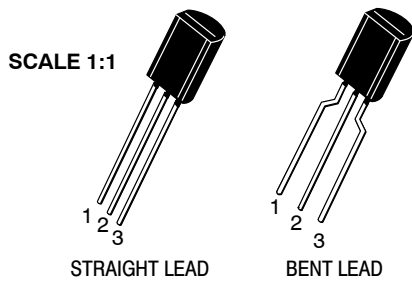


Figure 7. Active Region — Safe Operating Area

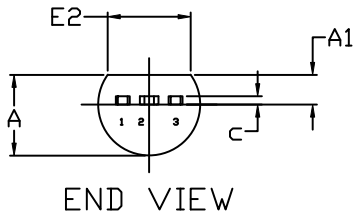
MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS



TO-92 (TO-226) 1 WATT
CASE 29-10
ISSUE D

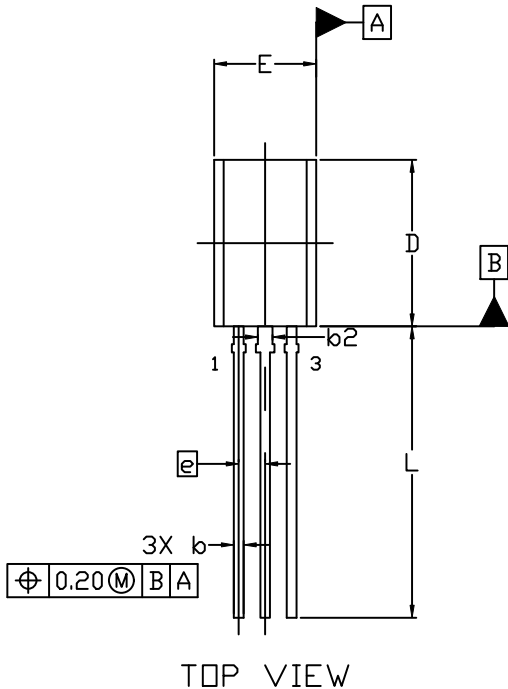
DATE 05 MAR 2021

STRAIGHT LEAD



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH OR GATE PROTRUSIONS.
4. DIMENSION b AND b2 DOES NOT INCLUDE DAMBAR PROTRUSION. LEAD WIDTH INCLUDING PROTRUSION SHALL NOT EXCEED 0.20. DIMENSION b2 LOCATED ABOVE THE DAMBAR PORTION OF MIDDLE LEAD.



DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	3.75	3.90	4.05
A1	1.28	1.43	1.58
b	0.38	0.465	0.55
b2	0.62	0.70	0.78
c	0.35	0.40	0.45
D	7.85	8.00	8.15
E	4.75	4.90	5.05
E2	3.90	---	---
e	1.27 BSC		
L	13.80	14.00	14.20

STYLES AND MARKING ON PAGE 3

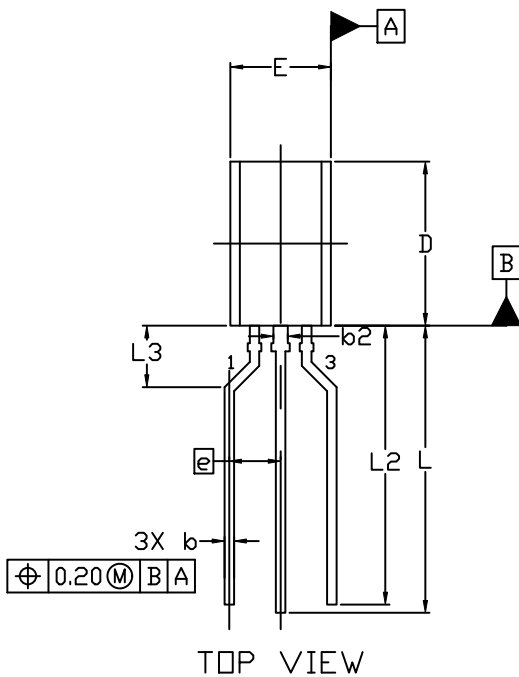
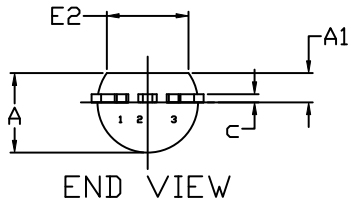
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TO-92 (TO-226) 1 WATT
CASE 29-10
ISSUE D

DATE 05 MAR 2021

FORMED LEAD




NOTES:

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DIM	MILLIMETERS		
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D	7.85	8.00	8.15
E	4.75	4.90	5.05
E2	3.90	---	---
e	2.50 BSC		
L	13.80	14.00	14.20
L2	13.20	13.60	14.00
L3	3.00 REF		

STYLES AND MARKING ON PAGE 3

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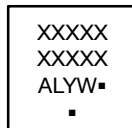
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**TO-92 (TO-226) 1 WATT
CASE 29-10
ISSUE D**

DATE 05 MAR 2021

- | | | | | |
|---|--|--|---|---|
| STYLE 1:
PIN 1. EMITTER
2. BASE
3. COLLECTOR | STYLE 2:
PIN 1. BASE
2. EMITTER
3. COLLECTOR | STYLE 3:
PIN 1. ANODE
2. ANODE
3. CATHODE | STYLE 4:
PIN 1. CATHODE
2. CATHODE
3. ANODE | STYLE 5:
PIN 1. DRAIN
2. SOURCE
3. GATE |
| STYLE 6:
PIN 1. GATE
2. SOURCE & SUBSTRATE
3. DRAIN | STYLE 7:
PIN 1. SOURCE
2. DRAIN
3. GATE | STYLE 8:
PIN 1. DRAIN
2. GATE
3. SOURCE & SUBSTRATE | STYLE 9:
PIN 1. BASE 1
2. EMITTER
3. BASE 2 | STYLE 10:
PIN 1. CATHODE
2. GATE
3. ANODE |
| STYLE 11:
PIN 1. ANODE
2. CATHODE & ANODE
3. CATHODE | STYLE 12:
PIN 1. MAIN TERMINAL 1
2. GATE
3. MAIN TERMINAL 2 | STYLE 13:
PIN 1. ANODE 1
2. GATE
3. CATHODE 2 | STYLE 14:
PIN 1. EMITTER
2. COLLECTOR
3. BASE | STYLE 15:
PIN 1. ANODE 1
2. CATHODE
3. ANODE 2 |
| STYLE 16:
PIN 1. ANODE
2. GATE
3. CATHODE | STYLE 17:
PIN 1. COLLECTOR
2. BASE
3. EMITTER | STYLE 18:
PIN 1. ANODE
2. CATHODE
3. NOT CONNECTED | STYLE 19:
PIN 1. GATE
2. ANODE
3. CATHODE | STYLE 20:
PIN 1. NOT CONNECTED
2. CATHODE
3. ANODE |
| STYLE 21:
PIN 1. COLLECTOR
2. EMITTER
3. BASE | STYLE 22:
PIN 1. SOURCE
2. GATE
3. DRAIN | STYLE 23:
PIN 1. GATE
2. SOURCE
3. DRAIN | STYLE 24:
PIN 1. EMITTER
2. COLLECTOR/ANODE
3. CATHODE | STYLE 25:
PIN 1. MT 1
2. GATE
3. MT 2 |
| STYLE 26:
PIN 1. V _{CC}
2. GROUND 2
3. OUTPUT | STYLE 27:
PIN 1. MT
2. SUBSTRATE
3. MT | STYLE 28:
PIN 1. CATHODE
2. ANODE
3. GATE | STYLE 29:
PIN 1. NOT CONNECTED
2. ANODE
3. CATHODE | STYLE 30:
PIN 1. DRAIN
2. GATE
3. SOURCE |
| STYLE 31:
PIN 1. GATE
2. DRAIN
3. SOURCE | STYLE 32:
PIN 1. BASE
2. COLLECTOR
3. EMITTER | STYLE 33:
PIN 1. RETURN
2. INPUT
3. OUTPUT | STYLE 34:
PIN 1. INPUT
2. GROUND
3. LOGIC | STYLE 35:
PIN 1. GATE
2. COLLECTOR
3. EMITTER |

**GENERIC
MARKING DIAGRAM***




- XXXX = Specific Device Code
A = Assembly Location
L = Wafer Lot
Y = Year
W = Work Week
▪ = Pb-Free Package

(Note: Microdot may be in either location)

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

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