FAIRCHILD SEMICONDUCTOR®

March 2008

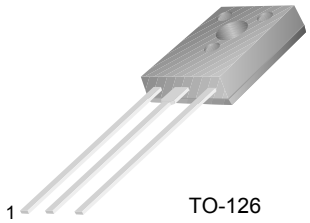
2SC3503/KSC3503
NPN Epitaxial Silicon Transistor

Applications

- Audio, Voltage Amplifier and Current Source
- CRT Display, Video Output
- General Purpose Amplifier

Features

- High Voltage : V_{CEO}= 300V
- Low Reverse Transfer Capacitance : C_{re}= 1.8pF at V_{CB} = 30V
- Excellent Gain Linearity for low THD
- High Frequency: 150MHz
- Full thermal and electrical Spice models are available
- Complement to 2SA1381/KSA1381.



TO-126

1. Emitter 2.Collector 3.Base

Absolute Maximum Ratings* T_a = 25°C unless otherwise noted

Symbol	Parameter	Ratings	Units
BV_{CBO}	Collector-Base Voltage	300	V
BV_{CEO}	Collector-Emitter Voltage	300	V
BV_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current(DC)	100	mA
I_{CP}	Collector Current(Pulse)	200	mA
P_C	Total Device Dissipation, T_C=25°C T_C=125°C	7 1.2	W W
T_J, T_{STG}	Junction and Storage Temperature	- 55 ~ +150	°C

* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

Thermal Characteristics* T_a=25°C unless otherwise noted

Symbol	Parameter	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	17.8	°C/W

* Device mounted on minimum pad size

h_{FE} Classification

Classification	C	D	E	F
h_{FE}	40 ~ 80	60 ~ 120	100 ~ 200	160 ~ 320

Electrical Characteristics* T_a=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
BV_{CBO}	Collector-Base Breakdown Voltage	I_C = 10μA, I_E = 0	300			V
BV_{CEO}	Collecto- Emitter Breakdown Voltage	I_C = 1mA, I_B = 0	300			V
BV_{EBO}	Emitter-Base Breakdown Voltage	I_E = 10μA, I_C = 0	5			V
I_{CBO}	Collector Cut-off Current	V_{CB} = 200V, I_E = 0			0.1	μA
I_{EBO}	Emitter Cut-off Current	V_{EB} = 4V, I_C = 0			0.1	μA
h_{FE}	DC Current Gain	V_{CE} = 10V, I_C = 10mA	40		320	
V_{CE}(sat)	Collector-Emitter Saturation Voltage	I_C = 20mA, I_B = 2mA			0.6	V
V_{BE}(sat)	Base-Emitter Saturation Voltage	I_C = 20mA, I_B = 2mA			1	V
f_T	Current Gain Bandwidth Product	V_{CE} = 30V, I_C = 10mA		150		MHz
C_{ob}	Output Capacitance	V_{CB} = 30V, f = 1MHz		2.6		pF
C_{re}	Reverse Transfer Capacitance	V_{CB} = 30V, f = 1MHz		1.8		pF

* Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

Ordering Information

Part Number*	Marking	Package	Packing Method	Remarks
2SC3503CSTU	2SC3503C	TO-126	TUBE	hFE1 C grade
2SC3503DSTU	2SC3503D	TO-126	TUBE	hFE1 D grade
2SC3503ESTU	2SC3503E	TO-126	TUBE	hFE1 E grade
2SC3503FSTU	2SC3503F	TO-126	TUBE	hFE1 F grade
KSC3503CSTU	C3503C	TO-126	TUBE	hFE1 C grade
KSC3503DSTU	C3503D	TO-126	TUBE	hFE1 D grade
KSC3503ESTU	C3503E	TO-126	TUBE	hFE1 E grade
KSC3503FSTU	C3503F	TO-126	TUBE	hFE1 F grade

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2. Suffix "-TU" means the tube packing, The Suffix "TU" could be replaced to other suffix character as packing method.

Typical Characteristics

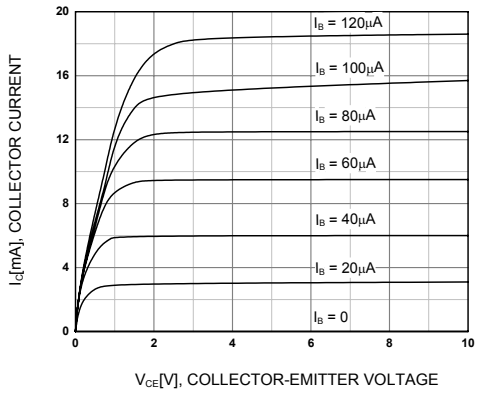
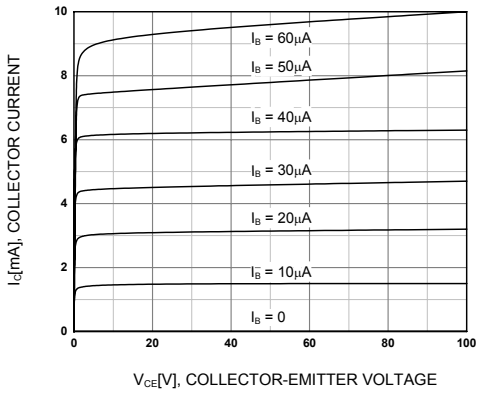


Figure 1. Static Characteristic



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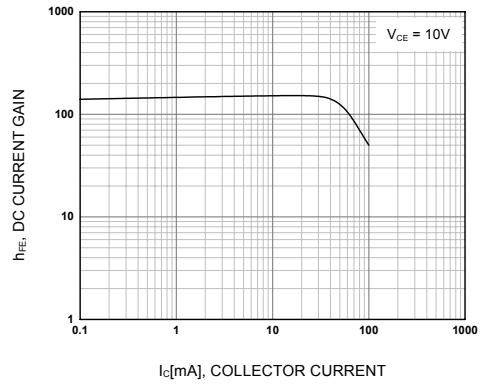


Figure 3. DC current Gain

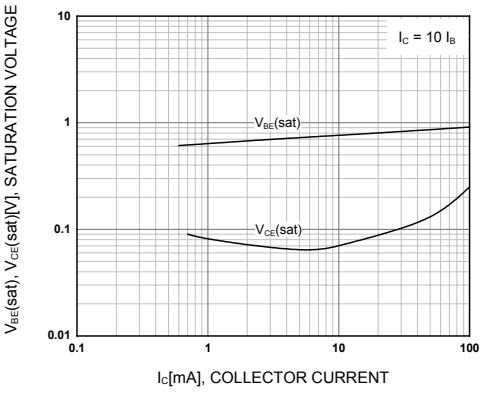
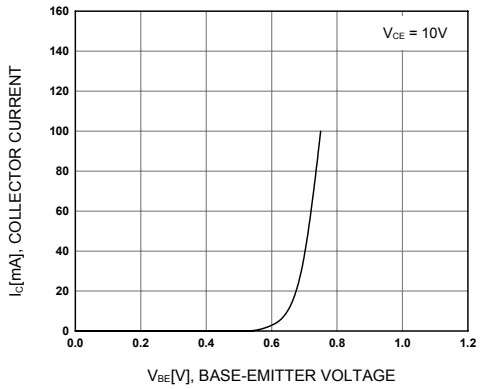


Figure 4. Base-Emitter Saturation Voltage Collector-Emitter Saturation Voltage



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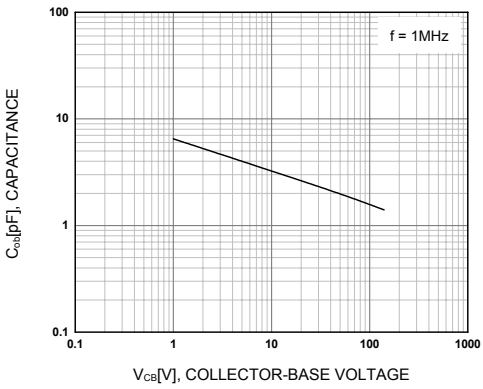


Figure 6. Collector Output Capacitance

Typical Characteristics (Continued)

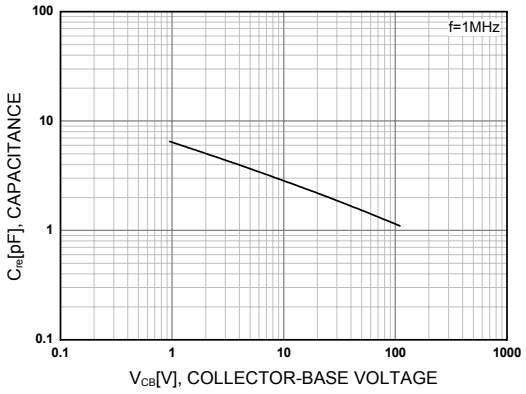


Figure 7. Reverse Transfer Capacitance

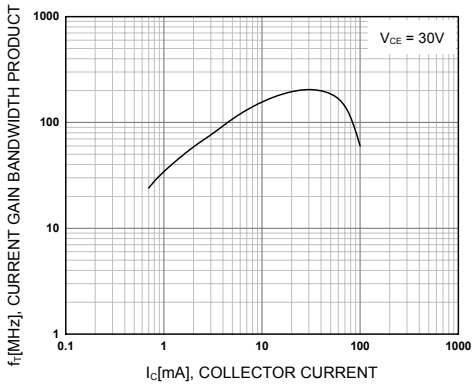
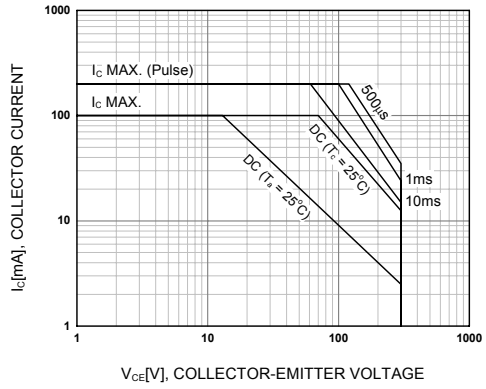


Figure 8. Current Gain Gandwidth Product



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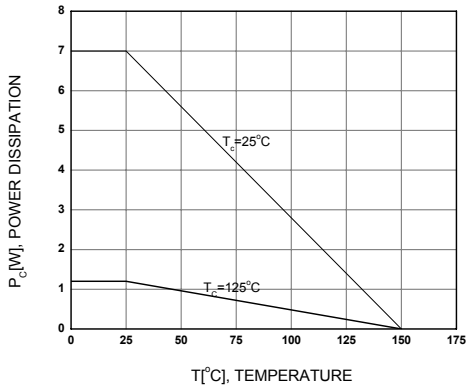
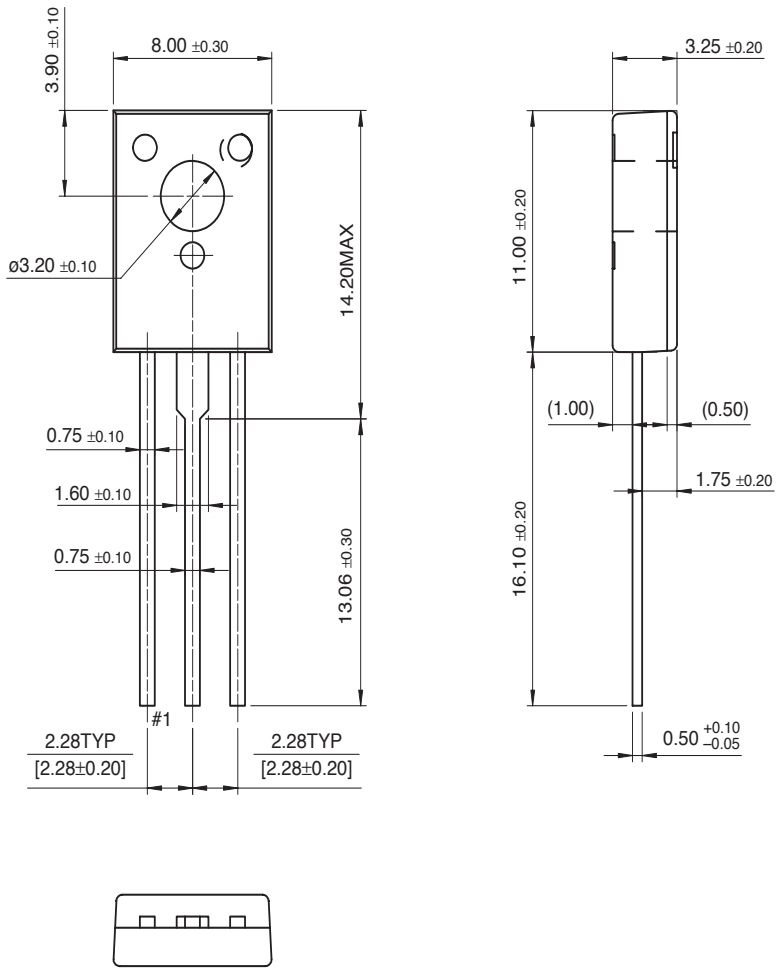


Figure 10. Power Derating

Package Dimensions

TO-126



Dimensions in Millimeters

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FACT Quiet Series™	MicroPak™	RapidConfigure™	TinyPWM™
FACT®	MillerDrive™	SMART START™	TinyWire™
FAST®	Motion-SPM™	SPM®	µSerDes™
FastvCore™	OPTOLOGIC®	STEALTH™	UHC®
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FRFET®	PDP-SPM™	SuperSOT™-3	VCX™
Global Power Resource℠	Power220®	SuperSOT™-6	

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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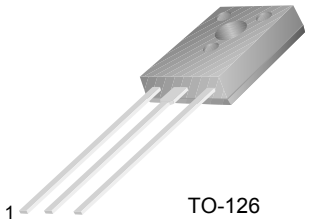

TO-126

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Symbol	Parameter	Ratings	Units
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BV_{CEO}	Collector-Emitter Voltage	-300	V
BV_{EBO}	Emitter-Base Voltage	-5	V
I_C	Collector Current(DC)	-100	mA
I_{CP}	Collector Current(Pulse)	-200	mA
P_C	Total Device Dissipation, T_C=25°C T_C=125°C	7 1.2	W W
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Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
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C_{ob}	Output Capacitance	V_{CB} = - 30V, f = 1MHz		3.1		pF
C_{re}	Reverse Transfer Capacitance	V_{CB} = - 30V, f = 1MHz		2.3		pF

* Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

Ordering Information

Part Number*	Marking	Package	Packing Method	Remarks
2SA1381CSTU	2SA1381C	TO-126	TUBE	hFE1 C grade
2SA1381DSTU	2SA1381D	TO-126	TUBE	hFE1 D grade
2SA1381ESTU	2SA1381E	TO-126	TUBE	hFE1 E grade
2SA1381FSTU	2SA1381F	TO-126	TUBE	hFE1 F grade
KSA1381CSTU	A1381C	TO-126	TUBE	hFE1 C grade
KSA1381DSTU	A1381D	TO-126	TUBE	hFE1 D grade
KSA1381ESTU	A1381E	TO-126	TUBE	hFE1 E grade
KSA1381FSTU	A1381F	TO-126	TUBE	hFE1 F grade

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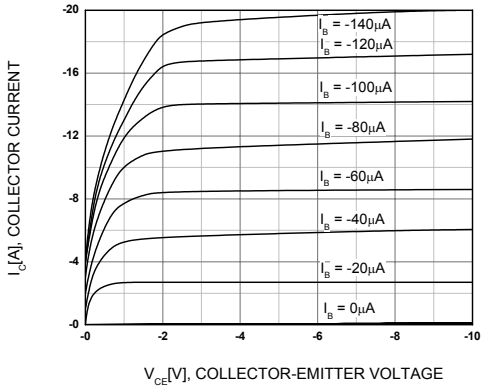

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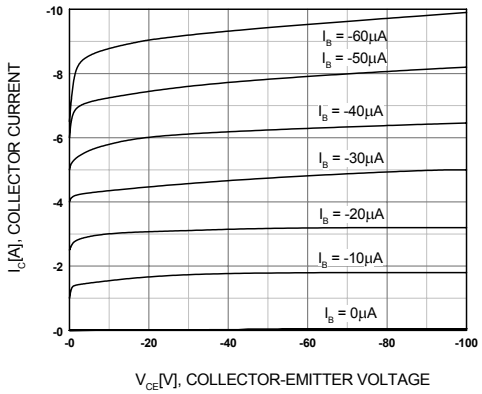

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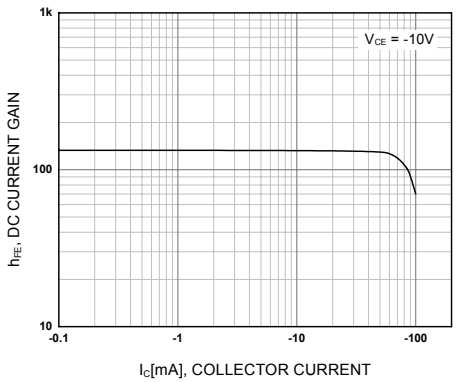
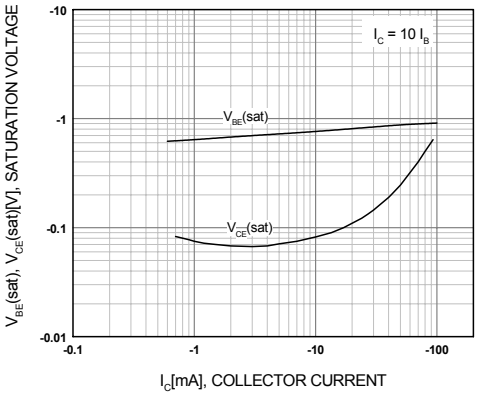


Figure 3. DC current Gain



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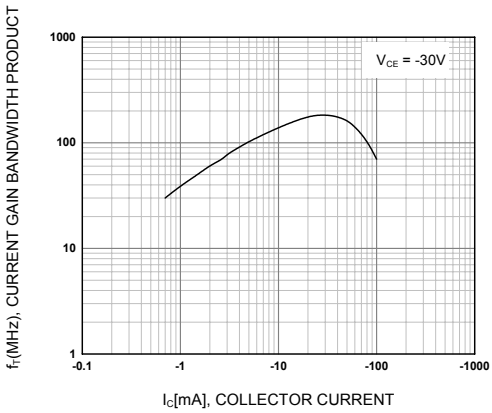


Figure 5. Current Gain Bandwidth Product

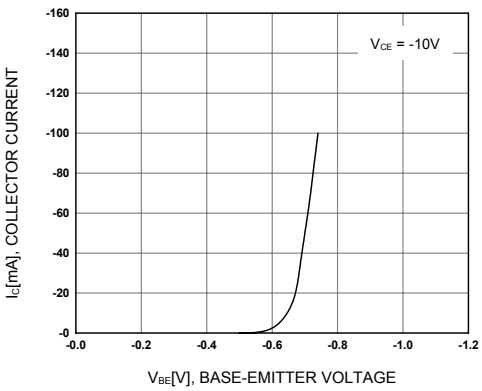


Figure 6. Base-Emitter On Voltage

Typical Characteristics (Continued)

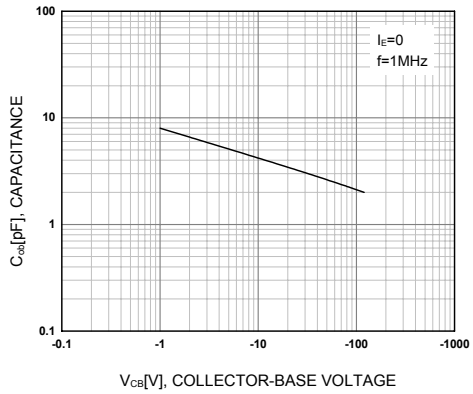


Figure 7. Collector Output Capacitance

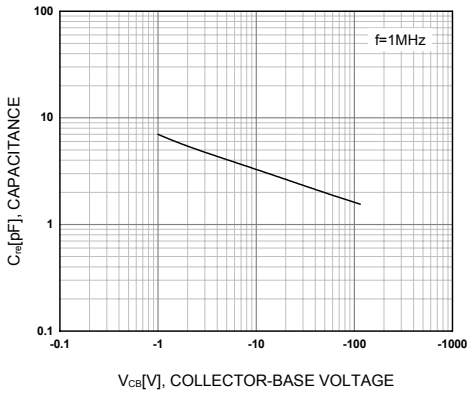


Figure 8. Reverse Transfer Capacitance

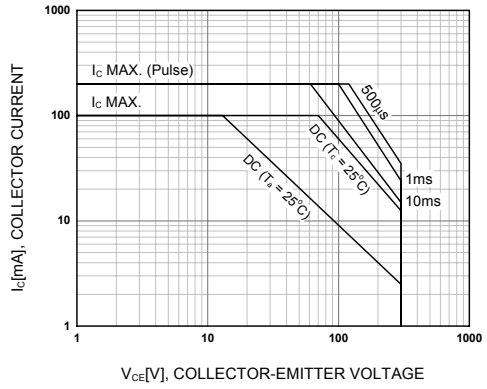
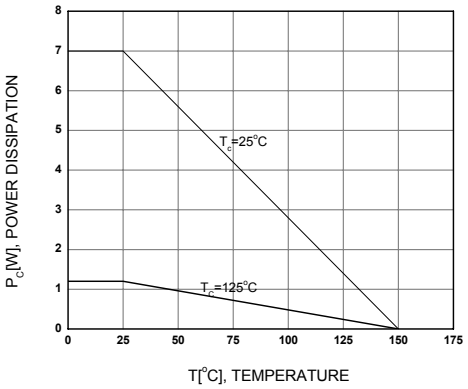


Figure 9. Safe Operating Area



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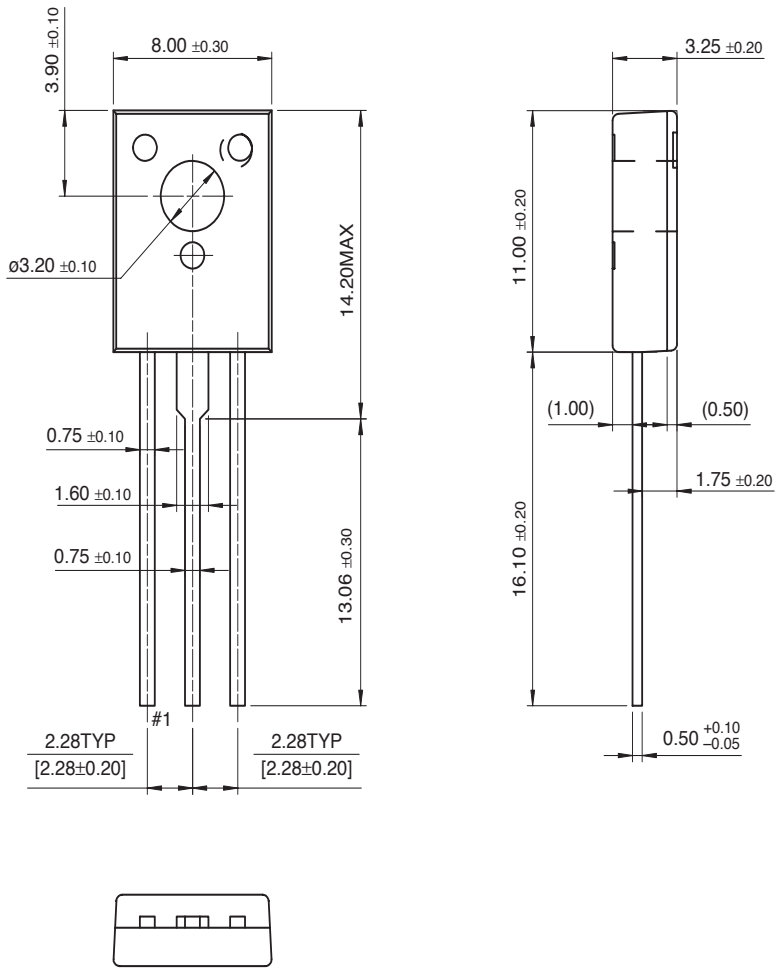
TO-126



Dimensions in Millimeters

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FPS™	®	SuperSOT™-3	UniFET™
FRFET®	PDP-SPM™	SuperSOT™-6	VCX™
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