January 2014

FFB2907A / FMB2907A / MMPQ2907A
PNP Multi-Chip General-Purpose Amplifier

Description

This device is designed for use as a general-purpose amplifier and switch for collector currents to 500 mA. Sourced from Process 63.

Block Diagram

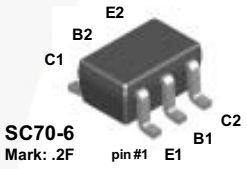

Figure 1. FFB2907A Device Package

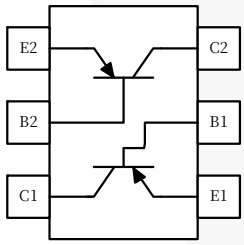

Figure 2. FFB2907A Internal Connections

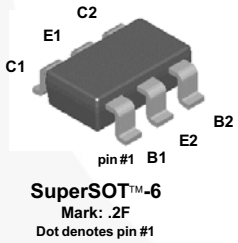

Figure 3. FMB2907A Device Package

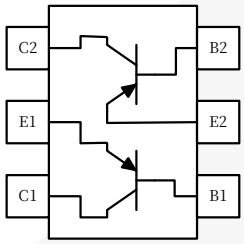

Figure 4. FMB2907A Internal Connections

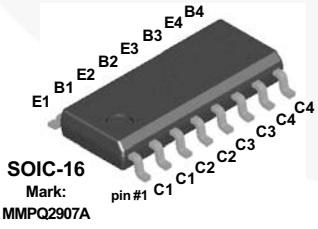

Figure 5. MMPQ2907A Device Package

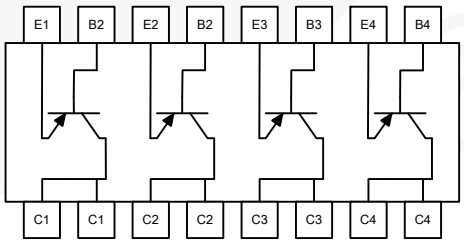

Figure 6. MMPQ2907A Internal Connections

Ordering Information

Part Number	Top Mark	Package	Packing Method
FFB2907A	.2F	SC70 6L	Tape and Reel
FMB2907A	.2F	SSOT 6L	Tape and Reel
MMPQ2907A	MMPQ2907A	SOIC 16L	Tape and Reel

Absolute Maximum Ratings(1),(2)

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Value	Unit
V_{CEO}	Collector-Emitter Voltage	-60	V
V_{CBO}	Collector-Base Voltage	-60	V
V_{EBO}	Emitter-Base Voltage	-5.0	V
I_C	Collector Current - Continuous	-600	mA
T_J, T_{STG}	Junction and Storage Temperature	-55 to +150	°C

Notes:

1. These ratings are based on a maximum junction temperature of 150°C.
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty cycle operations.

Thermal Characteristics(3)

Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Max.			Unit
		FFB2907A	FMB2907A	MMPQ2907A	
P_D	Total Device Dissipation	300	700	1,000	mW
	Derate Above 25°C	2.4	5.6	8.0	mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	415	180		°C/W
	Thermal Resistance, Junction to Ambient, Effective 4 Die			125	
	Thermal Resistance, Junction to Ambient, Each Die			240	

Note:

3. PCB size: FR-4 76 x 114 x 1.57 mm^3 (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

Electrical Characteristics[4]

Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage[4]	I_C = -10 mA, I_B = 0	-60			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = -10 μA, I_E = 0	-60			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = -10 μA, I_C = 0	-5.0			V
I_{BL}	Base Cut-Off Current	V_{CE} = -30 V, V_{EB} = -0.5 V			-50	nA
I_{CEX}	Collector Cut-Off Current	V_{CE} = -30 V, V_{EB} = -0.5 V			-50	nA
I_{CBO}	Collector Cut-Off Current	V_{CB} = -50 V, I_E = 0			-0.02	μA
		V_{CB} = -50 V, I_E = 0, T_A = 125°C			-20	
h_{FE}	DC Current Gain	I_C = -0.1 mA, V_{CE} = -10 V	75			
		I_C = -1.0 mA, V_{CE} = -10 V	100			
		I_C = -10 mA, V_{CE} = -10 V	100			
		I_C = -150 mA, V_{CE} = -10 V[4]	100		300	
		I_C = -500 mA, V_{CE} = -10 V[4]	50			
V_{CE}(sat)	Collector-Emitter Saturation Voltage[4]	I_C = -150 mA, I_B = -15 mA			-0.4	V
		I_C = -500 mA, I_B = -50 mA			-1.6	
V_{BE}(sat)	Base-Emitter Saturation Voltage	I_C = -150 mA, I_B = -15 mA[4]			-1.3	V
		I_C = -500 mA, I_B = -50 mA			-2.6	
f_T	Current Gain-Bandwidth Product	I_C = -50 mA, V_{CE} =- 20 V, f = 100 MHz		250		MHz
C_{ob}	Output Capacitance	V_{CB} = -10 V, I_E = 0, f = 100 kHz		6.0		pF
C_{ib}	Input Capacitance	V_{EB} = -2.0 V, I_C = 0, f = 100 kHz		12		pF
t_{on}	Turn-On Time	V_{CC} = -30 V, I_C = -150 mA, I_{B1} = -15 mA		30		ns
t_d	Delay Time			8		ns
t_r	Rise Time			20		ns
t_{off}	Turn-Off Time	V_{CC} = -6.0 V, I_C = -150 mA, I_{B1} = I_{B2} = -15 mA		80		ns
t_s	Storage Time			60		ns
t_f	Fall Time			20		ns

Note:

4. Pulse test: pulse width ≤ 300 μs, duty cycle ≤ 2.0%.

Typical Performance Characteristics

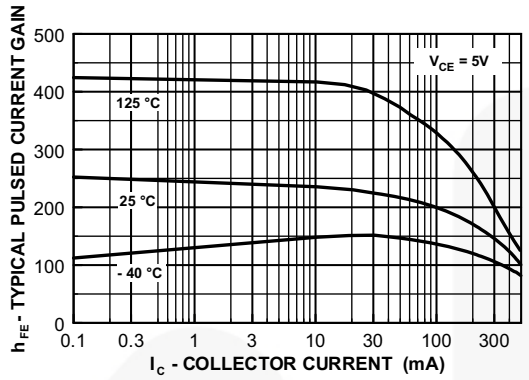

Figure 7. Typical Pulsed Current Gain vs. Collector Current

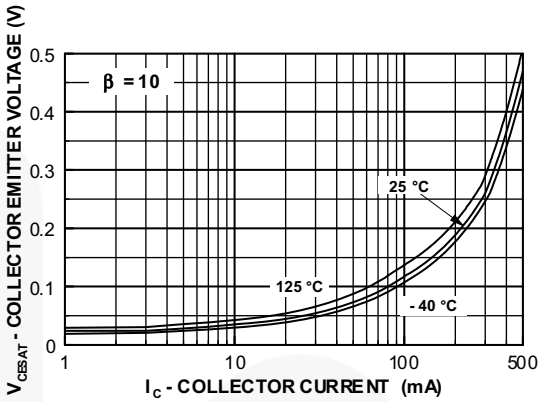

Figure 8. Collector-Emitter Saturation Voltage vs. Collector Current

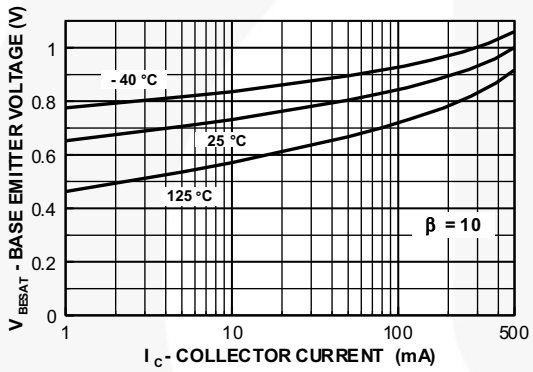

Figure 9. Base-Emitter Saturation Voltage vs. Collector Current

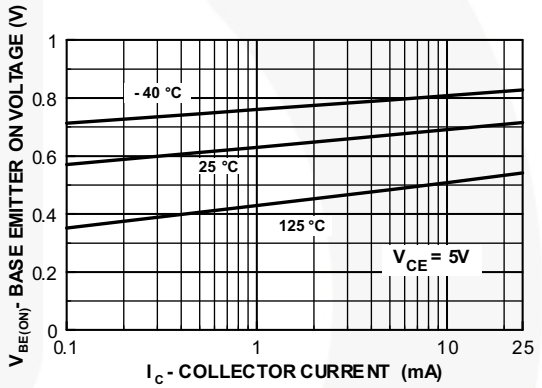

Figure 10. Base-Emitter On Voltage vs. Collector Current

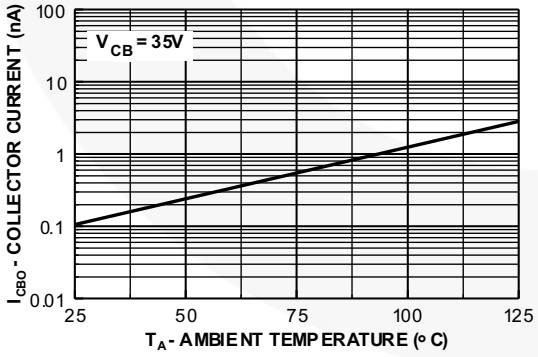

Figure 11. Collector Cut-Off Current vs. Ambient Temperature

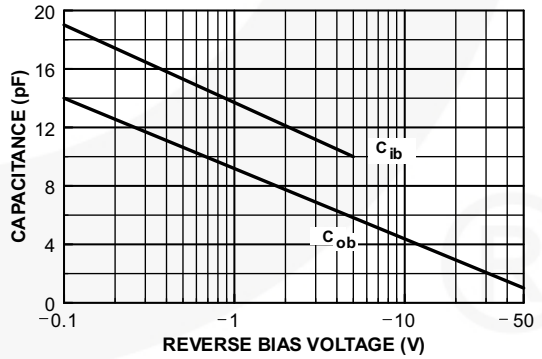

Figure 12. Input and Output Capacitance vs. Reverse Bias Voltage

Typical Performance Characteristics (Continued)

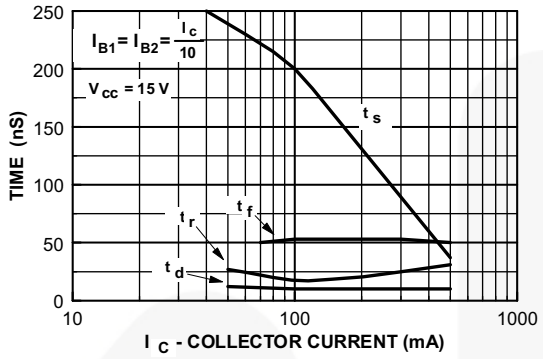

Figure 13. Switching Times vs. Collector Current

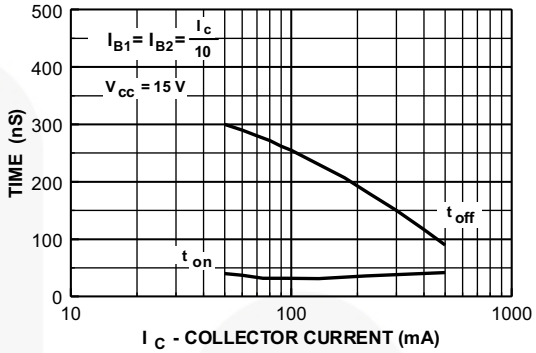

Figure 14. Turn-On and Turn-Off Times vs. Collector Current

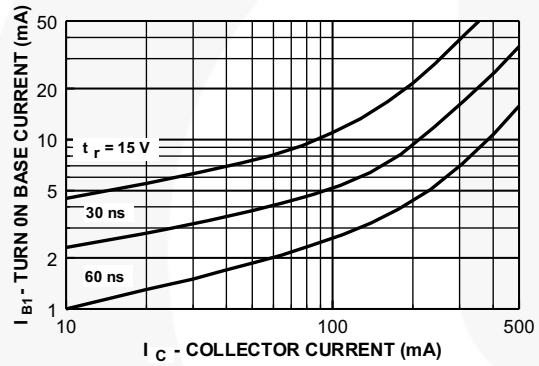

Figure 15. Rise Time vs. Collector and Turn-On Base Current

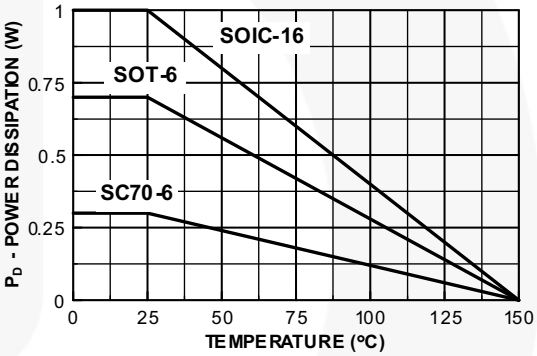

Figure 16. Power Dissipation vs. Ambient Temperature

Typical Performance Characteristics (f = 1.0 kHz)

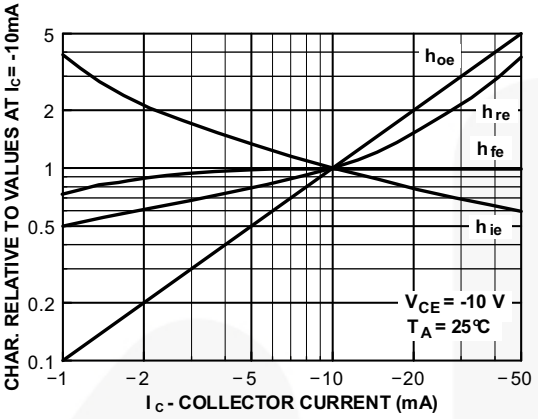

Figure 17. Common Emitter Characteristics

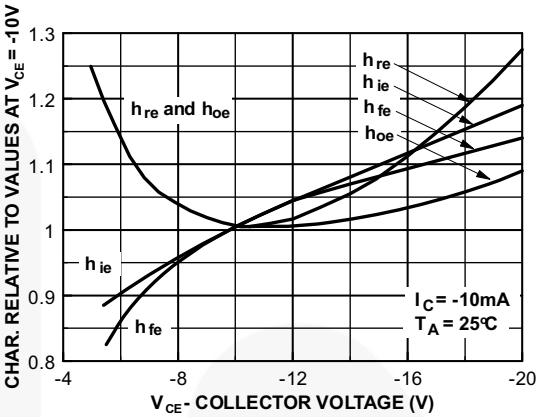

Figure 18. Common Emitter Characteristics

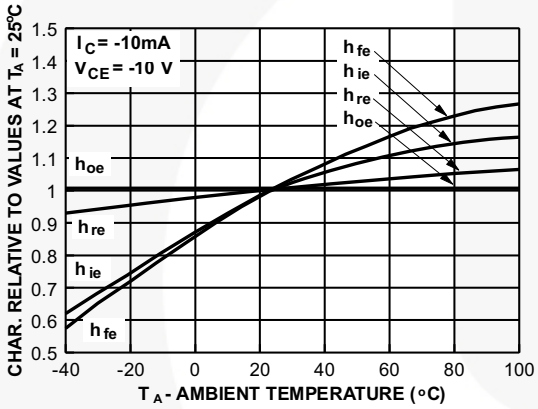

Figure 19. Common Emitter Characteristics

Physical Dimensions

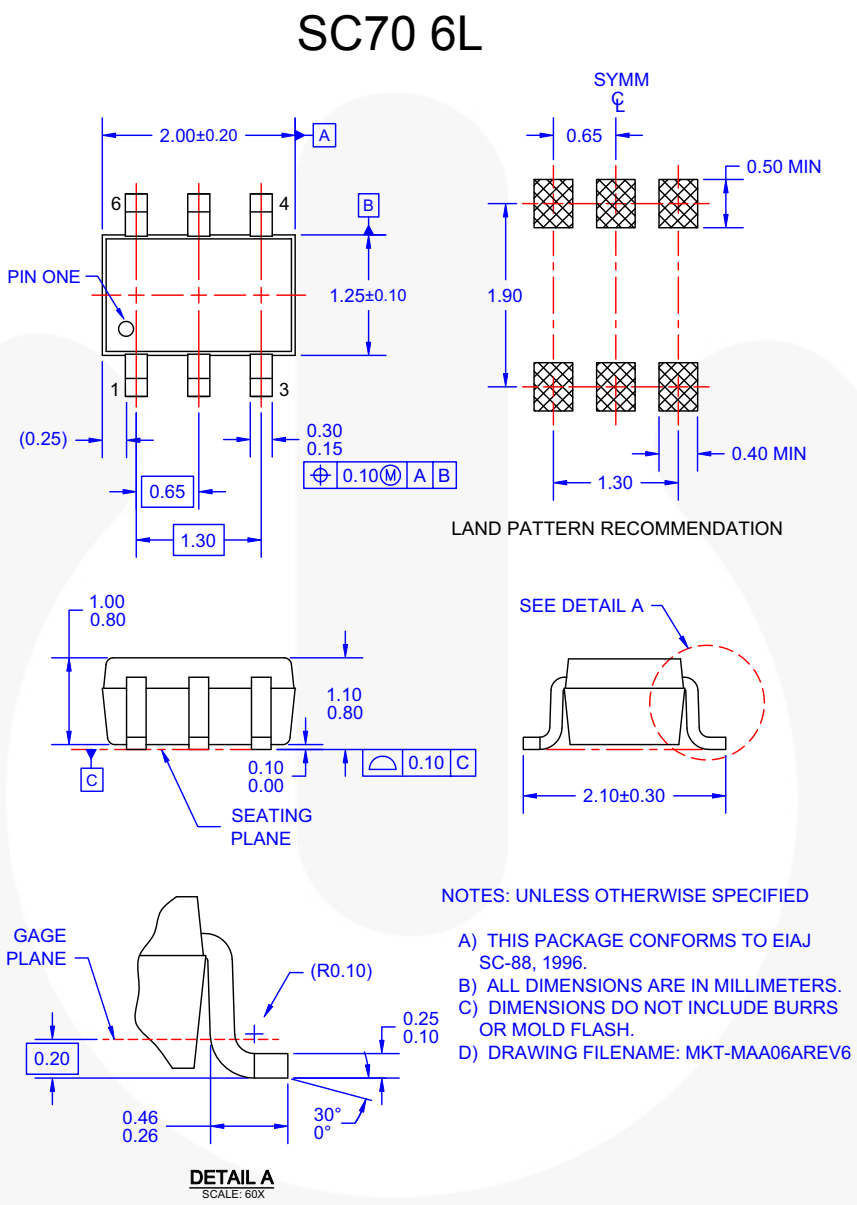

Figure 20. 6-LEAD, SC70, EIAJ SC-88, 1.25 MM WIDE (ACTIVE)

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Physical Dimensions (Continued)

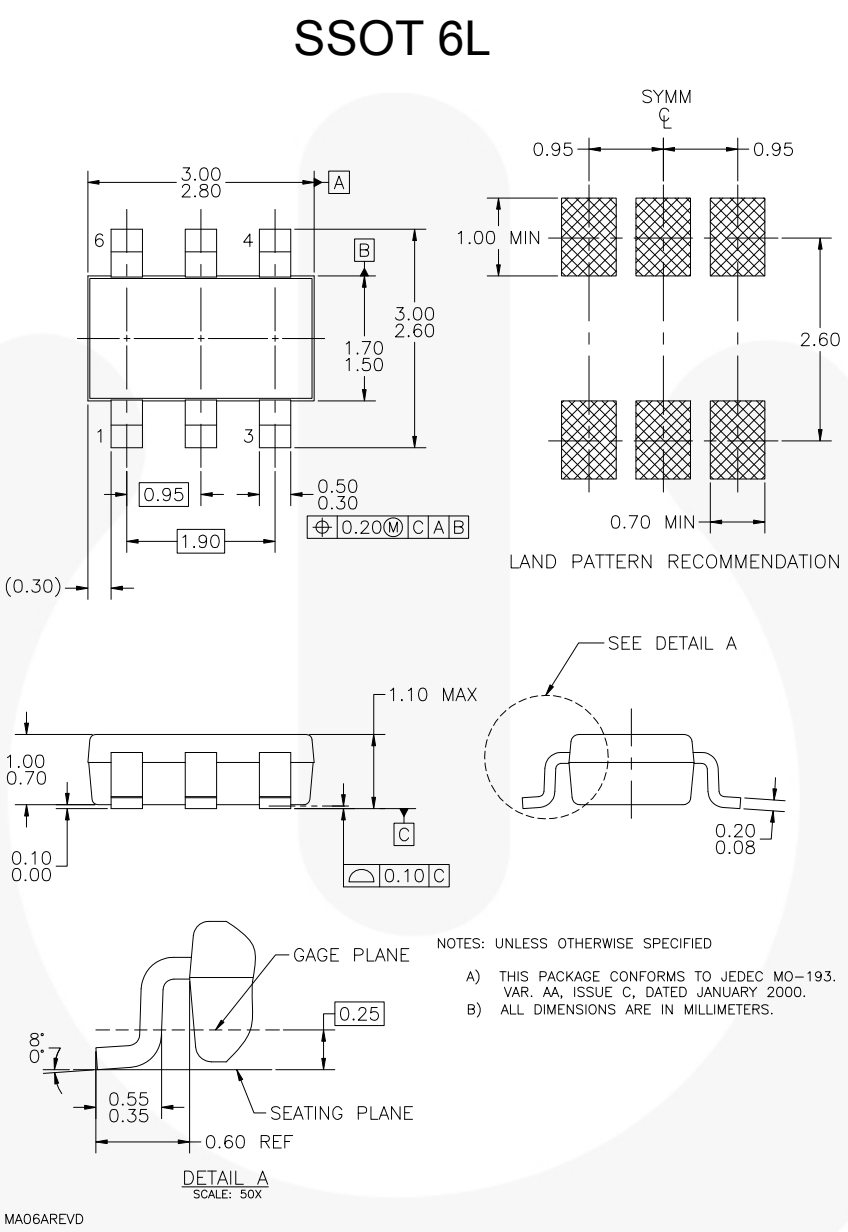

Figure 21. 6-LEAD, SUPERSOT-6, JEDEC MO-193, 1.6 MM WIDE (ACTIVE)

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Physical Dimensions (Continued)

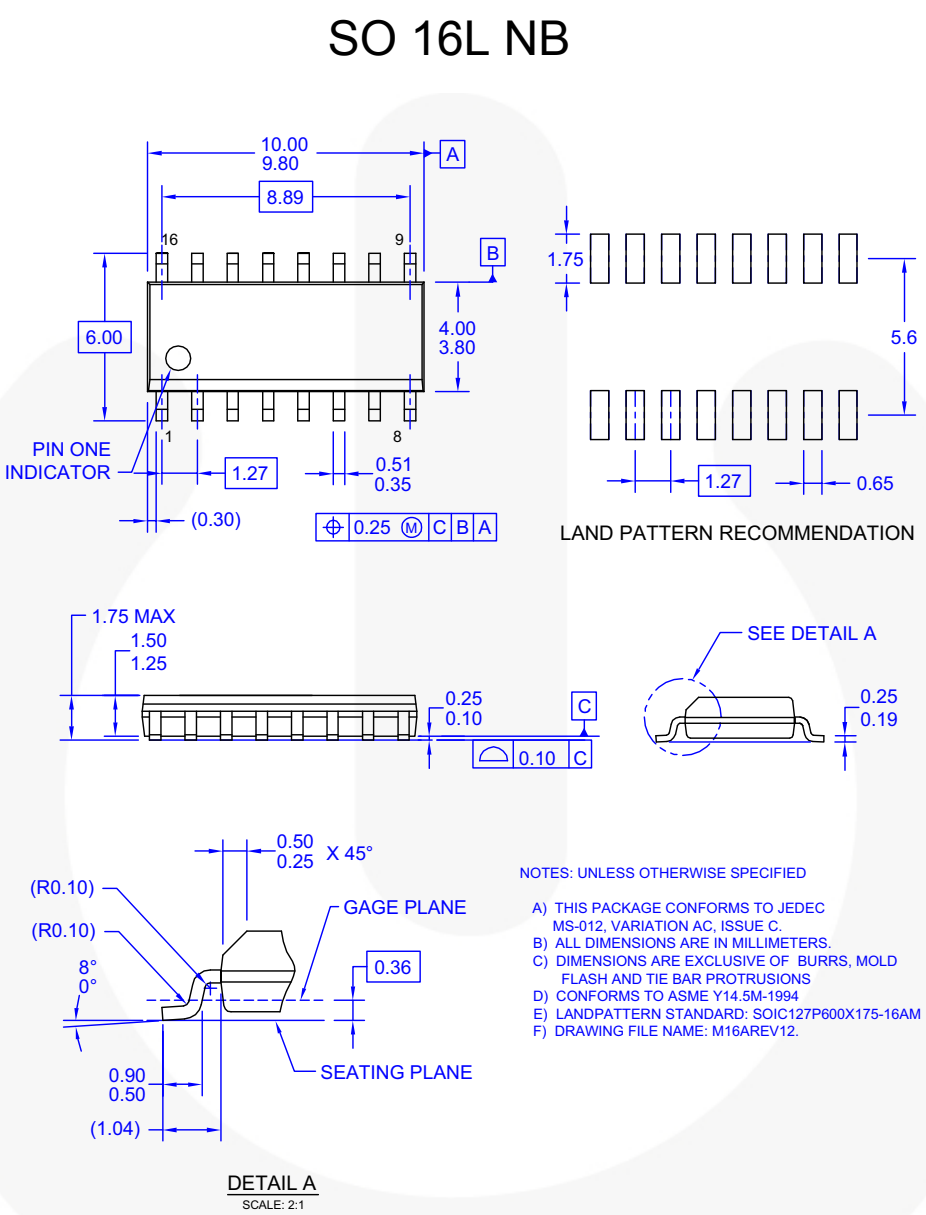

Figure 22. 16-LEAD, SOIC, JEDEC MS-012, 0.150 inch, NARROW BODY (ACTIVE)

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