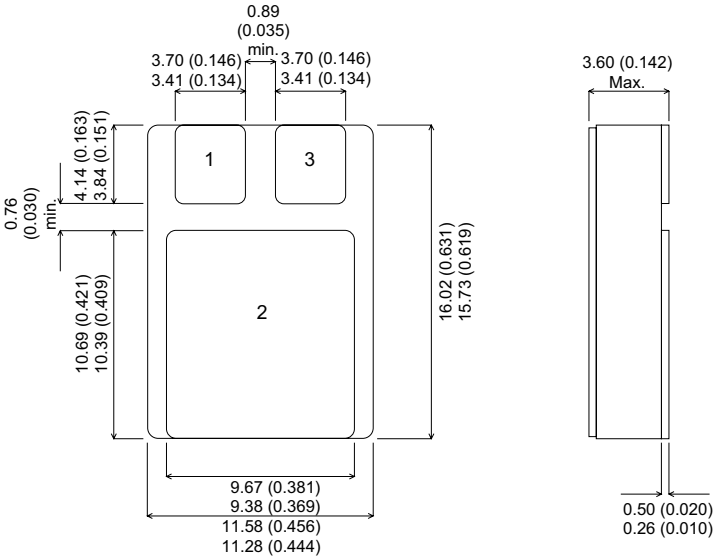
BUL54ASMD

ADVANCED
DISTRIBUTED BASE DESIGN
HIGH VOLTAGE
HIGH SPEED NPN
SILICON POWER TRANSISTOR

- **SEMEFAB DESIGNED AND DIFFUSED DIE**
- **HIGH VOLTAGE**
- **FAST SWITCHING (t_f = 40ns)**
- **EXCEPTIONAL HIGH TEMPERATURE PERFORMANCE**
- **HIGH ENERGY RATING**
- **EFFICIENT POWER SWITCHING**
- **MILITARY AND HI–REL OPTIONS**

MECHANICAL DATA
Dimensions in mm



SMD1 Package

Pad 1 – Base Pad 2 – Collector Pad 3 – Emitter

FEATURES

- **Multi–base design for efficient energy distribution across the chip resulting in significantly improved switching and energy ratings across full temperature range.**
- **Ion implant and high accuracy masking for tight control of characteristics from batch to batch.**
- **Triple Guard Rings for improved control of high voltages.**

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C unless otherwise stated)

V_{CBO}	Collector – Base Voltage	1000V
V_{CEO}	Collector – Emitter Voltage (I_B = 0)	500V
V_{EBO}	Emitter – Base Voltage	10V
I_C	Collector Current	2A
$I_{C(PK)}$	Peak Collector Current	4A
I_B	Base Current	0.8A
P_{tot}	Total Dissipation at T_{case} = 25°C	35W
	Derate above 25°C when used on efficient heatsink	0.2W/°C
T_{stg}	Operating and Storage Temperature Range	–65 to 200°C
R_{th}	Thermal Resistance Junction – Case	3.5°C/W

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Prelim. 7/00

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ELECTRICAL CHARACTERISTICS (T_{case} = 25°C unless otherwise stated)

	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
	ELECTRICAL CHARACTERISTICS						
$V_{CEO(sus)}$*	Collector – Emitter Sustaining Voltage	I_C = 100mA		500			V
$V_{(BR)CBO}$*	Collector – Base Breakdown Voltage	I_C = 1mA		1000			
$V_{(BR)EBO}$*	Emitter – Base Breakdown Voltage	I_E = 1mA	I_C = 0	10			
I_{CEO}*	Collector – Emitter Cut–Off Current	I_B = 0	V_{CC} = 500V			100	µA
I_{CBO}*	Collector – Base Cut–Off Current	I_E = 0	V_{CB} = 1000V			10	µA
			T_C = 125°C			100	
I_{EBO}*	Emitter Cut–Off Current	I_C = 0	V_{EB} = 5V			10	µA
			T_C = 125°C			100	
h_{FE}*	DC Current Gain	I_C = 100mA	V_{CE} = 4V	20	40		—
		I_C = 500mA	V_{CE} = 4V	12	18		
		I_C = 1A	V_{CE} = 4V	5	8		
			T_C = 125°C	4	7		
$V_{CE(sat)}$*	Collector – Emitter Saturation Voltage	I_C = 100mA	I_B = 20mA		0.05	0.1	V
		I_C = 500mA	I_B = 100mA		0.15	0.2	
		I_C = 1A	I_B = 200mA		0.3	0.5	
$V_{BE(sat)}$*	Base – Emitter Saturation Voltage	I_C = 500mA	I_B = 100mA		0.8	1.0	V
		I_C = 1A	I_B = 200mA		0.9	1.1	
$V_{BE(on)}$*	Base – Emitter On Voltage	I_C = 500mA	V_{CE} = 4V		0.8	1.0	V
	DYNAMIC CHARACTERISTICS						
f_T	Transition Frequency	I_C = 100µA f = 10MHz	V_{CE} = 4V		20		MHz
C_{ob}	Output Capacitance	V_{CB} = 20V I_E = 0	f = 1MHz		20	35	pF
	SECOND BREAKDOWN						
$I_{S/B}$	Second Breakdown Collector Current	V_{CE} = 50V	t = 1s	0.8			A
	SWITCHING CHARACTERISTICS (resistive load)						
t_{on}	On Time	V_{CC} = 150V I_{B1} = 0.2A	I_C = 1A I_{B2} = –0.4A		0.08	0.2	µs
t_s	Storage Time				2	4	
t_f	Fall Time				0.04	0.1	

* Pulse test t_p = 300µs , $\delta \leq 2\%$