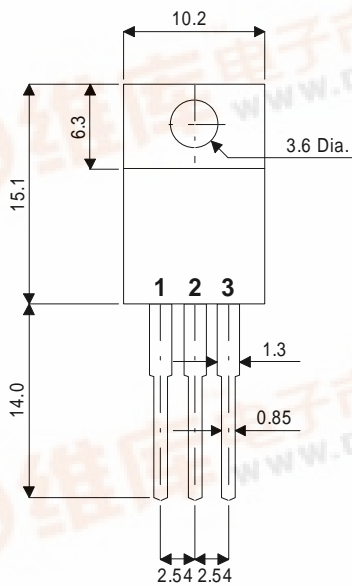




BUL54AFI

**MECHANICAL DATA**

Dimensions in mm



**ISOLATED TO220**

Pin 1 – Base      Pin 2 – Collector      Pin 3 – Emitter

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

Designed for use in  
electronic ballast applications

- SEMEFAB DESIGNED AND DIFFUSED DIE
- HIGH VOLTAGE
- FAST SWITCHING
- HIGH ENERGY RATING
- MILITARY AND HI-REL VERSIONS AVAILABLE IN METAL AND CERAMIC SURFACE MOUNT PACKAGES

**FEATURES**

- Multi-base 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** ( $T_{case} = 25^{\circ}C$  unless otherwise stated)

$V_{CBO}$	Collector – Base Voltage	1000V
$V_{CEO}$	Collector – Emitter Voltage ( $I_B = 0$ )	500V
$V_{EBO}$	Emitter – Base Voltage ( $I_C = 0$ )	10V
$I_C$	Continuous Collector Current	4A
$I_{C(PK)}$	Peak Collector Current	7A
$I_B$	Base Current	2A
$T_{tot}$	Total Dissipation at $T_{case} = 25^{\circ}C$	30W
$T_{stg}$	Operating and Storage Temperature Range	-55 to +150°C



**ELECTRICAL CHARACTERISTICS** ( $T_{case} = 25^{\circ}C$  unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>ELECTRICAL CHARACTERISTICS</b>					
$V_{CEO(sus)}$	Collector – Emitter Sustaining Voltage	$I_C = 10mA$	500		
$V_{(BR)CBO}$	Collector – Base Breakdown Voltage	$I_C = 1mA$	1000		V
$V_{(BR)EBO}$	Emitter – Base Breakdown Voltage	$I_E = 1mA$	10		
$I_{CBO}$	Collector – Base Cut-Off Current	$V_{CB} = 1000V$		10	$\mu A$
			$T_C = 125^{\circ}C$	100	
$I_{CEO}$	Collector – Emitter Cut-Off Current	$I_B = 0$	$V_{CE} = 500V$	100	$\mu A$
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = 9V$	$I_C = 0$		10
				$T_C = 125^{\circ}C$	100
$h_{FE}^*$	DC Current Gain	$I_C = 0.1A$	$V_{CE} = 5V$	20	40
		$I_C = 0.5A$	$V_{CE} = 5V$	12	15
		$I_C = 1A$	$V_{CE} = 1V$	5	8
			$T_C = 125^{\circ}C$		
$V_{CE(sat)}^*$	Collector – Emitter Saturation Voltage	$I_C = 100mA$	$I_B = 20mA$	0.05	0.1
		$I_C = 0.5A$	$I_B = 0.1A$	0.15	0.2
		$I_C = 1A$	$I_B = 0.2A$	0.3	0.5
$V_{BE(sat)}^*$	Base – Emitter Saturation Voltage	$I_C = 0.5A$	$I_B = 0.1A$	0.8	1.0
		$I_C = 1A$	$I_B = 0.2A$	0.9	1.1
<b>DYNAMIC CHARACTERISTICS</b>					
$f_t$	Transition Frequency	$I_C = 0.2A$	$V_{CE} = 4V$	20	MHz
$C_{ob}$	Output Capacitance	$V_{CB} = 20V$	$f = 1MHz$	20	pF

\* Pulse test  $t_p = 300\mu s$ ,  $\delta < 2\%$