

Silicon Diffused Power Transistor

BU4523AW

GENERAL DESCRIPTION

Enhanced performance, new generation, high-voltage, high-speed switching npn transistor in a plastic envelope intended for use in horizontal deflection circuits of colour television receivers and p.c monitors. Features exceptional tolerance to base drive and collector current load variations resulting in a very low worst case dissipation.

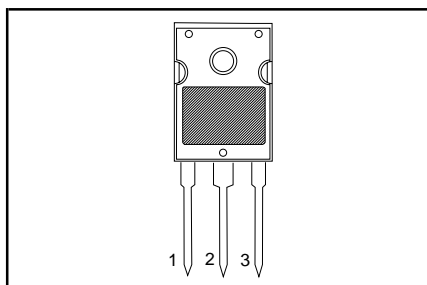
QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{CESM}	Collector-emitter voltage peak value	$V_{BE} = 0 \text{ V}$	-	1500	V
V_{CEO}	Collector-emitter voltage (open base)		-	800	V
I_C	Collector current (DC)		-	11	A
I_{CM}	Collector current peak value		-	29	A
P_{tot}	Total power dissipation	$T_{hs} \leq 25 \text{ }^\circ\text{C}$	-	125	W
V_{CEsat}	Collector-emitter saturation voltage	$I_C = 8 \text{ A}; I_B = 2 \text{ A}$	-	3.0	V
I_{Csat}	Collector saturation current.	$f = 16 \text{ kHz}$	8	-	A
		$f = 70 \text{ kHz}$	6.5	-	A
t_f	Fall time	$I_{Csat} = 8 \text{ A}; f = 16 \text{ kHz}$	0.3	0.4	μs
		$I_{Csat} = 6.5 \text{ A}; f = 70 \text{ kHz}$	0.14	-	μs

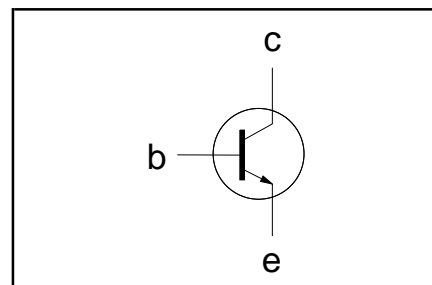
PINNING - SOT429

PIN	DESCRIPTION
1	base
2	collector
3	emitter
tab	collector

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

Limiting values in accordance with the Absolute Maximum Rating System (IEC 134)

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CESM}	Collector-emitter voltage peak value	$V_{BE} = 0 \text{ V}$	-	1500	V
V_{CEO}	Collector-emitter voltage (open base)		-	800	V
I_C	Collector current (DC)		-	11	A
I_{CM}	Collector current peak value		-	29	A
I_B	Base current (DC)		-	7	A
I_{BM}	Base current peak value		-	10	A
$-I_{BM}$	Reverse base current peak value ¹		-	7	A
P_{tot}	Total power dissipation	$T_{hs} \leq 25 \text{ }^\circ\text{C}$	-	125	W
T_{stg}	Storage temperature		-55	150	$^\circ\text{C}$
T_j	Junction temperature		-	150	$^\circ\text{C}$

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$R_{th\ j-mb}$	Junction to mounting base		-	1	K/W
$R_{th\ j-a}$	Junction to ambient	in free air	45	-	K/W

¹ Turn-off current.

Silicon Diffused Power Transistor

BU4523AW

STATIC CHARACTERISTICS

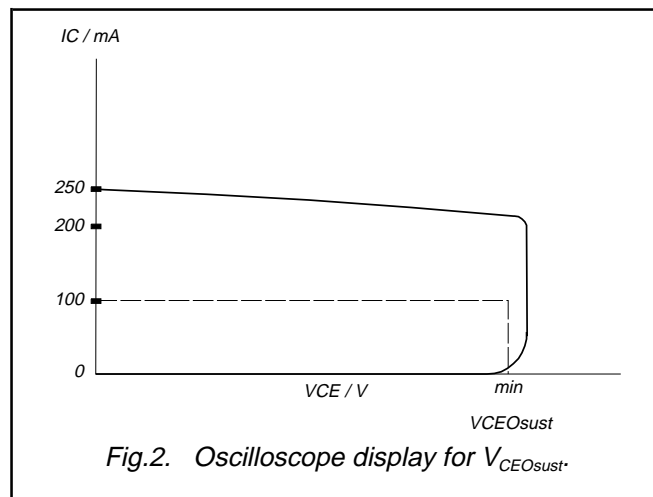
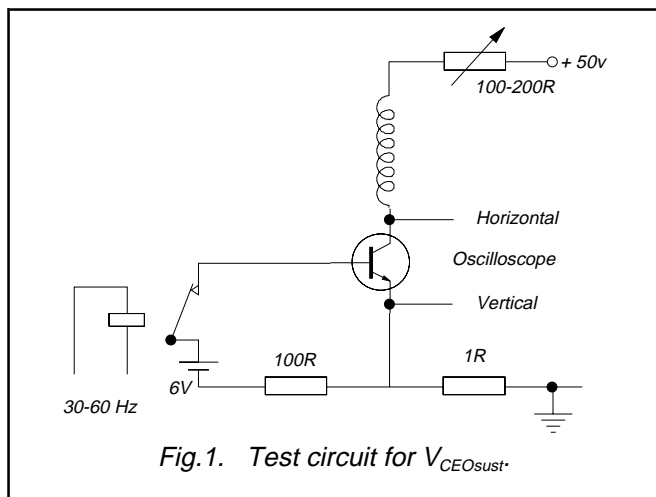
$T_{hs} = 25\text{ }^\circ\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CES}	Collector cut-off current ²	$V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$	-	-	1.0	mA
I_{CES}		$V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$	-	-	2.0	mA
I_{EBO}	Emitter cut-off current	$T_j = 125\text{ }^\circ\text{C}$ $V_{EB} = 6\text{ V}; I_C = 0\text{ A}$	-	-	100	μA
BV_{EBO}	Emitter-base breakdown voltage	$I_B = 1\text{ mA}$	7.5	12.5	-	V
$V_{CEOsust}$	Collector-emitter sustaining voltage	$I_B = 0\text{ A}; I_C = 100\text{ mA};$ $L = 25\text{ mH}$	800	-	-	V
V_{CEsat}	Collector-emitter saturation voltage	$I_C = 8\text{ A}; I_B = 2\text{ A}$	-	-	3.0	V
V_{BEsat}	Base-emitter saturation voltage	$I_C = 8\text{ A}; I_B = 2\text{ A}$	0.85	0.95	1.1	V
h_{FE}	DC current gain	$I_C = 1\text{ A}; V_{CE} = 5\text{ V}$	-	14	-	
h_{FE}		$I_C = 8\text{ A}; V_{CE} = 5\text{ V}$	4.2	5.8	7.3	

DYNAMIC CHARACTERISTICS

$T_{hs} = 25\text{ }^\circ\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
	Switching times (16 kHz line deflection circuit)	$I_{Csat} = 8.0\text{ A}; I_{B1} = 1.6\text{ A}$ ($I_{B2} = -4.0\text{ A}$)			
t_s	Turn-off storage time		4.5	5.5	μs
t_f	Turn-off fall time		0.30	0.40	μs
	Switching times (70 kHz line deflection circuit)	$I_{Csat} = 6.5\text{ A}; I_{B1} = 1.3\text{ A}$ ($I_{B2} = -3.9\text{ A}$)			
t_s	Turn-off storage time		2.3	-	μs
t_f	Turn-off fall time		0.14	-	μs



² Measured with half sine-wave voltage (curve tracer).

Silicon Diffused Power Transistor

BU4523AW

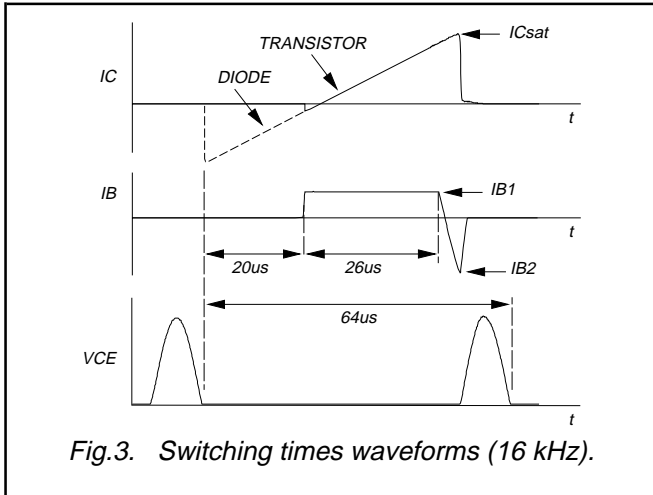


Fig.3. Switching times waveforms (16 kHz).

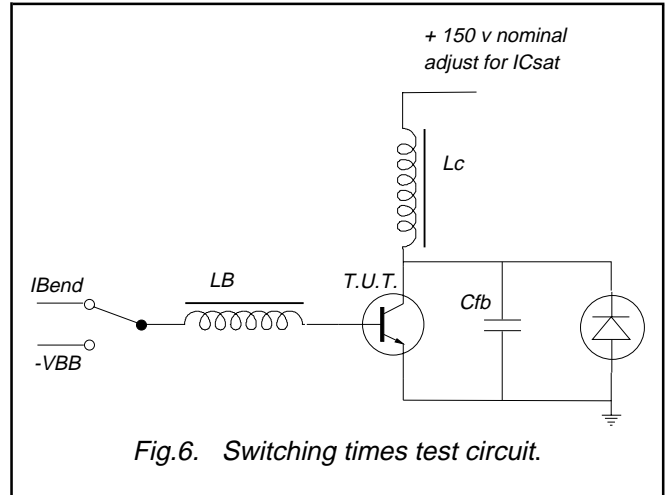


Fig.6. Switching times test circuit.

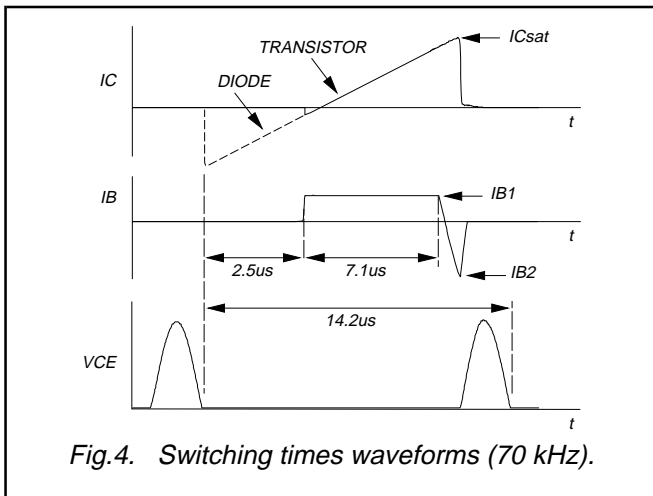


Fig.4. Switching times waveforms (70 kHz).

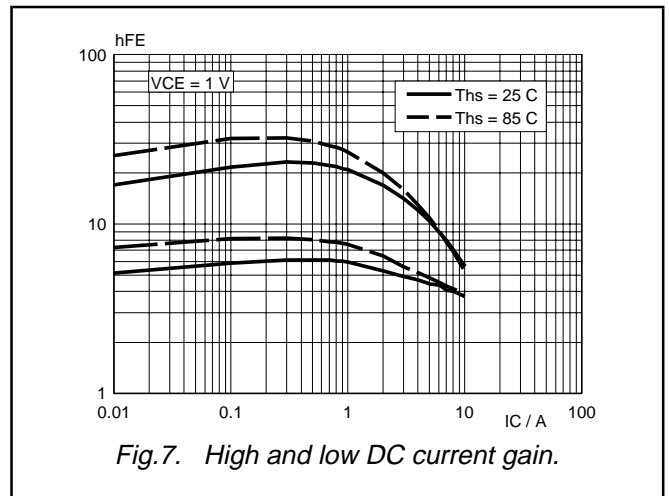


Fig.7. High and low DC current gain.

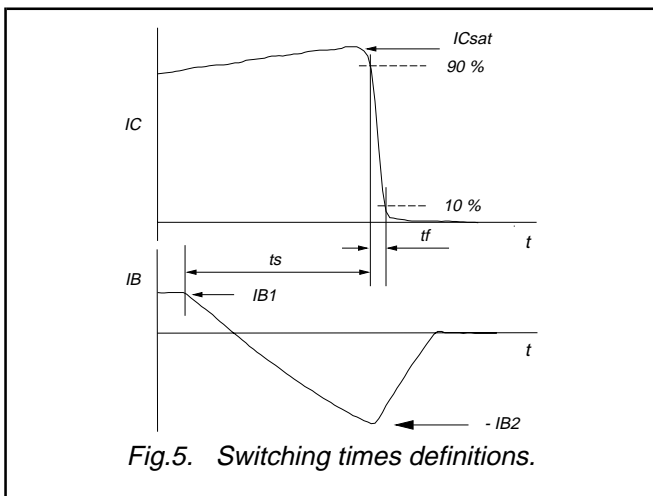


Fig.5. Switching times definitions.

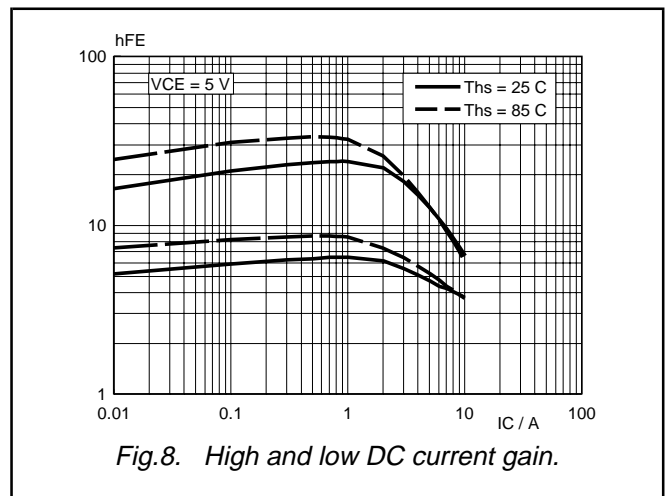
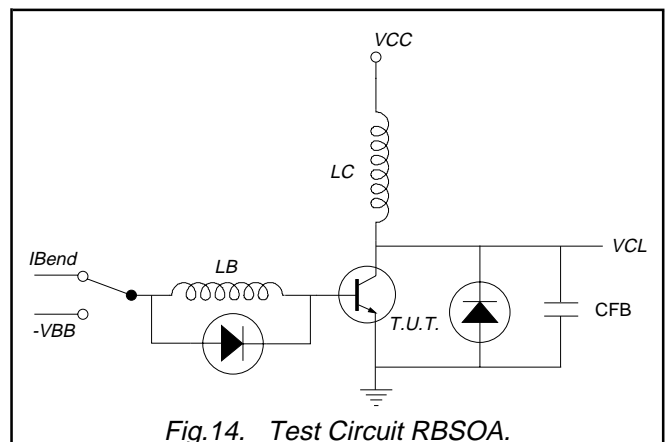
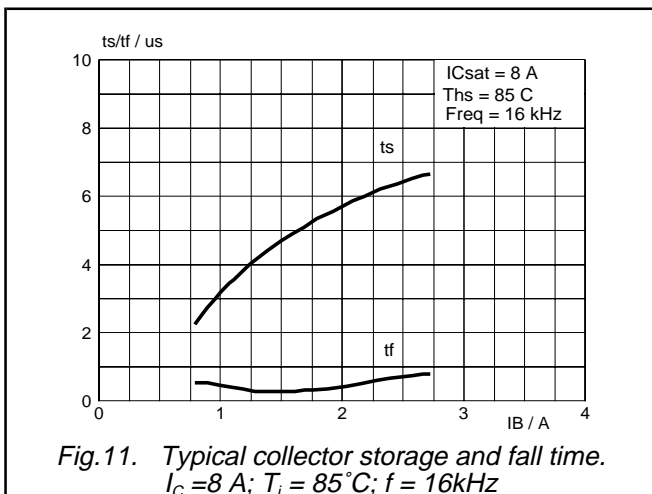
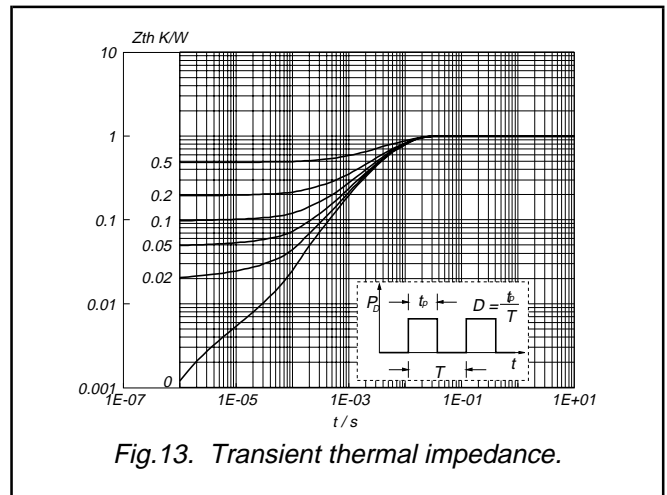
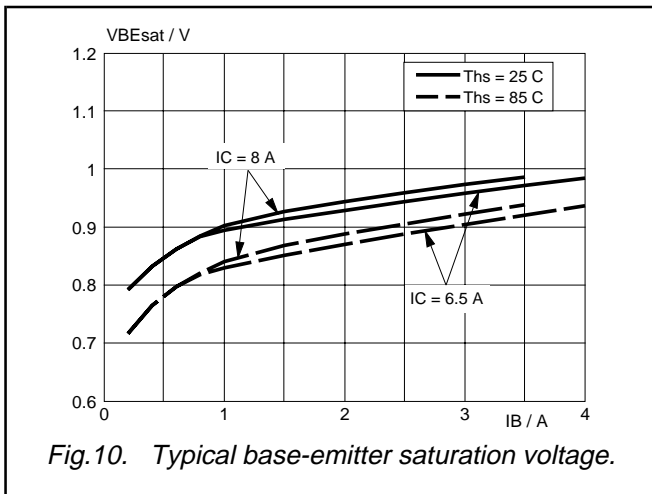
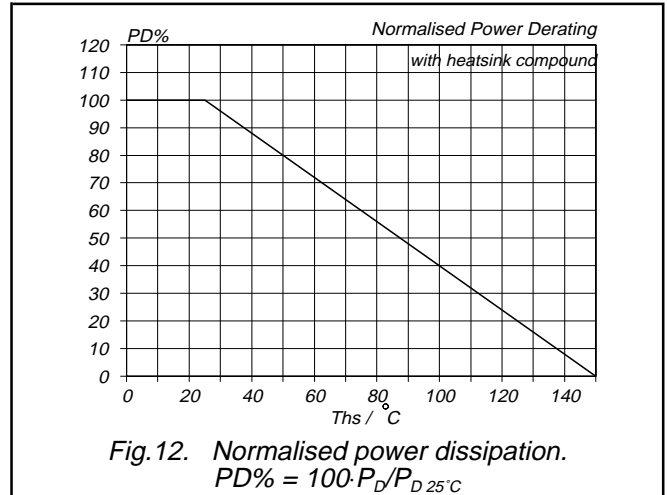
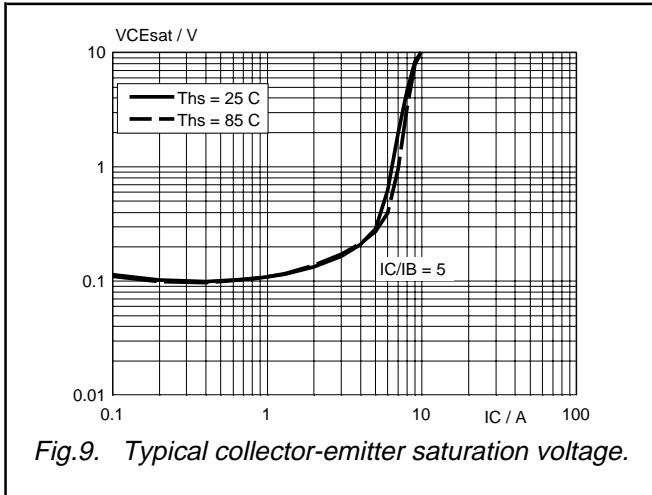


Fig.8. High and low DC current gain.

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BU4523AW

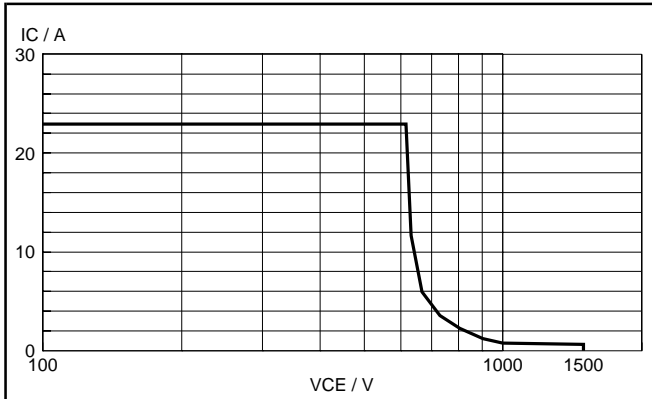


Fig.15. Reverse bias safe operating area. $T_j \leq T_{jmax}$

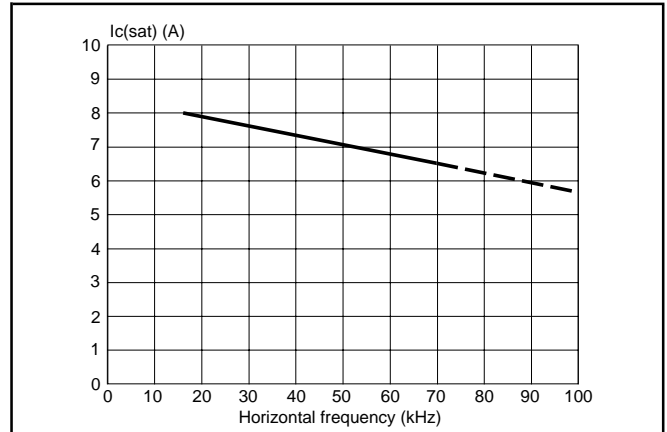
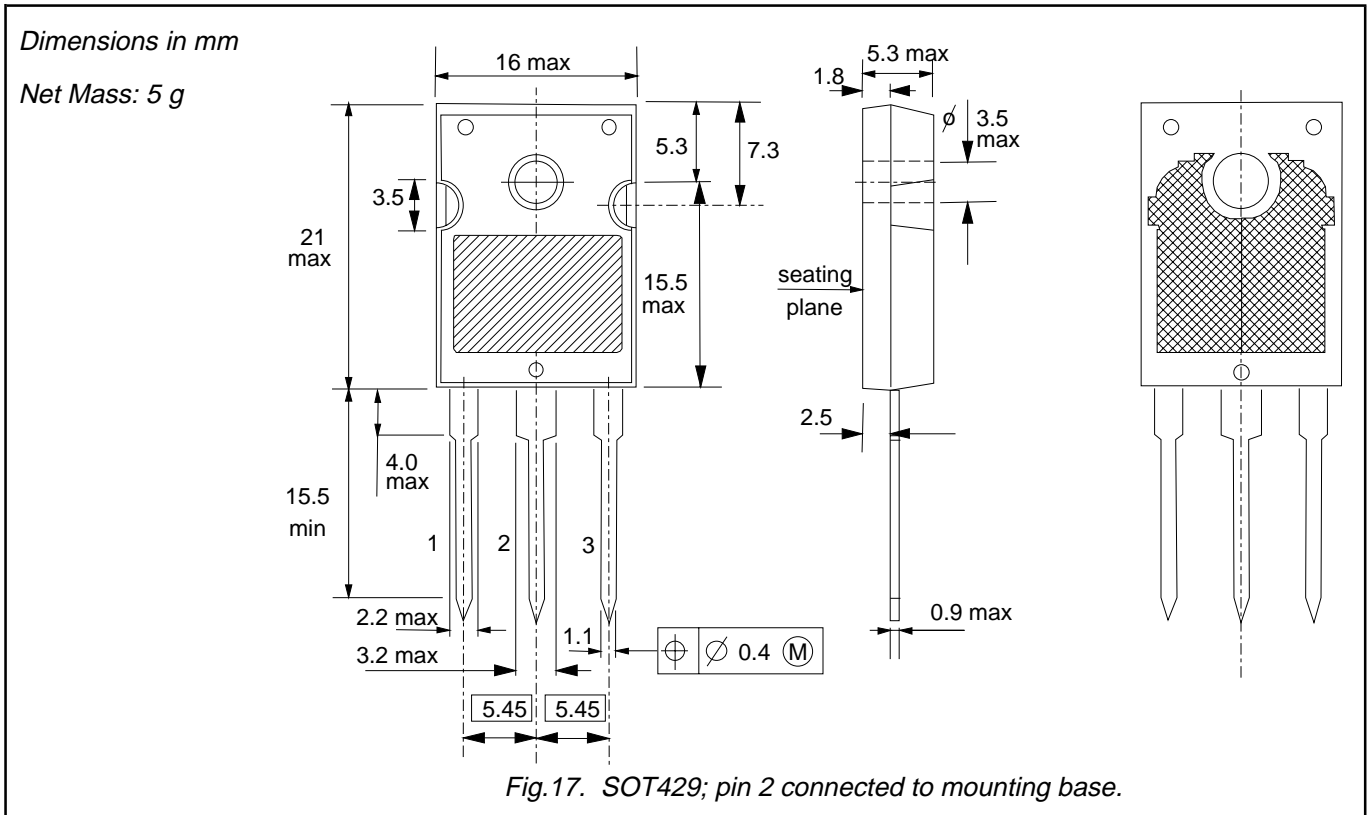


Fig.16. I_{Csat} during normal running vs. frequency of operation for optimum performance

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MECHANICAL DATA



Notes

1. Refer to mounting instructions for SOT429 envelope.
2. Epoxy meets UL94 V0 at 1/8".

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DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values are given in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of this specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	
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