SGS-THOMSON MICROELECTRONICS

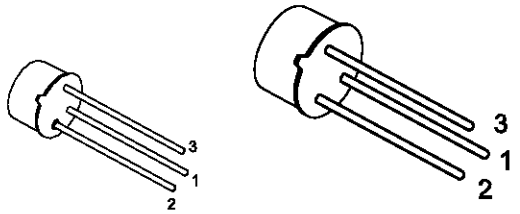
2N2905A
2N2907A

GENERAL PURPOSE AMPLIFIERS AND SWITCHES

DESCRIPTION

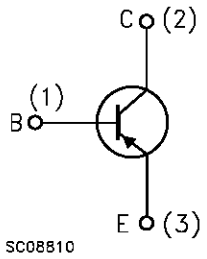
The 2N2905A and 2N2907A are silicon planar epitaxial PNP transistors in Jedec TO-39 (for 2N2905A) and in Jedec TO-18 (for 2N2907A) metal case. They are designed for high speed saturated switching and general purpose applications.

2N2905A approved to CECC 50002-100, 2N2906A approved to CECC 50002-103 available on request.



TO-18 **TO-39**

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage (I_E = 0)	-60	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)	-60	V
V_{EBO}	Emitter-Base Voltage (I_C = 0)	-5	V
I_C	Collector Current	-0.6	A
P_{tot}	Total Dissipation at $T_{amb} \leq 25\ ^oC$		
	for **2N2905A**	0.6	W
	for **2N2907A**	0.4	W
	at $T_{case} \leq 25\ ^oC$		
	for **2N2905A**	3	W
	for **2N2907A**	1.8	W
T_{stg}	Storage Temperature	-65 to 200	^oC
T_j	Max. Operating Junction Temperature	200	^oC

THERMAL DATA

		TO-39	TO-18	
$R_{thj\text{-}case}$	Thermal Resistance Junction-Case Max	58.3	97.3	$^oC/W$
$R_{thj\text{-}amb}$	Thermal Resistance Junction-Ambient Max	292	437.5	$^oC/W$

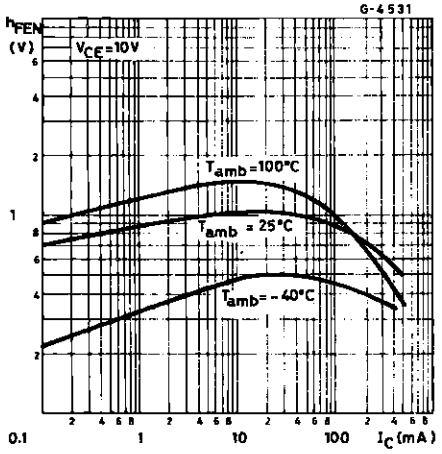
ELECTRICAL CHARACTERISTICS (T_{case} = 25 ^oC unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_E = 0)	V_{CB} = -50 V V_{CB} = -50 V T_{case} = 150 ^oC			-10 -10	nA µA
I_{CEX}	Collector Cut-off Current (V_{BE} = -0.5V)	V_{CE} = -30 V			-50	nA
I_{BEX}	Base Cut-off Current (V_{BE} = -0.5V)	V_{CE} = -30 V			-50	nA
$V_{(BR)CBO}$*	Collector-Base Breakdown Voltage (I_E = 0)	I_C = -10 µA	-60			V
$V_{(BR)CEO}$*	Collector-Emitter Breakdown Voltage (I_B = 0)	I_C = -10 mA	-60			V
$V_{(BR)EBO}$*	Emitter-Base Breakdown Voltage (I_C = 0)	I_E = -10 µA	-5			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = -150 mA I_B = -15 mA I_C = -500 mA I_B = -50 mA			-0.4 -1.6	V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = -150 mA I_B = -15 mA I_C = -500 mA I_B = -50 mA			-1.3 -2.6	V V
h_{FE}*	DC Current Gain	I_C = -0.1 mA V_{CE} = -10 V I_C = -1 mA V_{CE} = -10 V I_C = -10 mA V_{CE} = -10 V I_C = -150 mA V_{CE} = -10 V I_C = -500 mA V_{CE} = -10 V	75 100 100 100 50		 300 	
f_T	Transition Frequency	V_{CE} = -50 V f = 100 MHz I_C = -20 mA	200			MHz
C_{EBO}	Emitter Base Capacitance	I_C = 0 V_{EB} = -2 V f = 1MHz			30	pF
C_{CBO}	Collector Base Capacitance	I_E = 0 V_{CB} = -10 V f = 1MHz			8	pF
t_d**	Delay Time	V_{CC} = -30 V I_C = -150 mA I_{B1} = -15 mA			10	ns
t_r**	Rise Time	V_{CC} = -30 V I_C = -150 mA I_{B1} = -15 mA			40	ns
t_s**	Storage Time	V_{CC} = -6 V I_C = -150 mA I_{B1} = $-I_{B2}$ = -15 mA			80	ns
t_f**	Fall Time	V_{CC} = -6 V I_C = -150 mA I_{B1} = $-I_{B2}$ = -15 mA			30	ns
t_{on}**	Turn-on Time	V_{CC} = -30 V I_C = -150 mA I_{B1} = -15 mA			45	ns
t_{off}**	Turn-off Time	V_{CC} = -6 V I_C = -150 mA I_{B1} = $-I_{B2}$ = -15 mA			100	ns

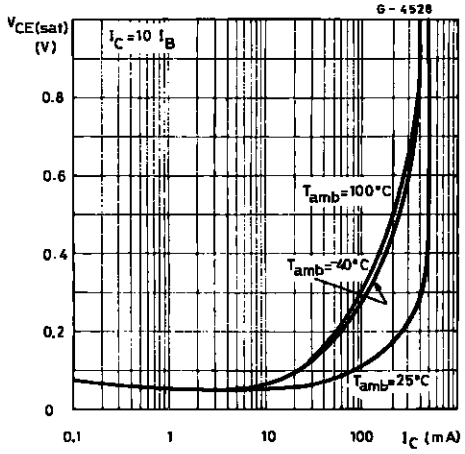
* Pulsed: Pulse duration = 300 µs, duty cycle ≤ 1 %

** See test circuit

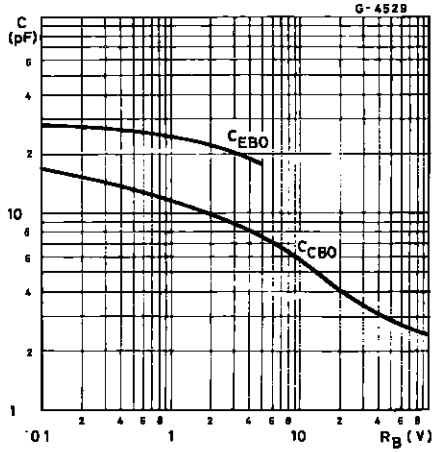
Normalized DC Current Gain.



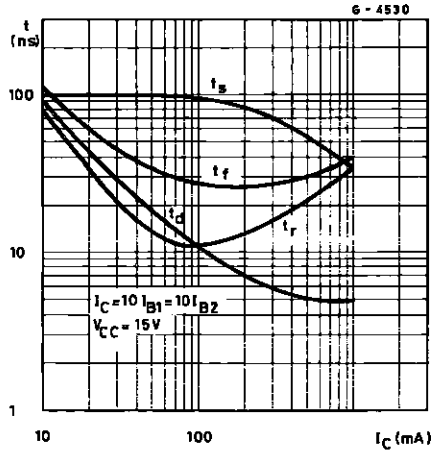
Collector-emitter Saturation Voltage.



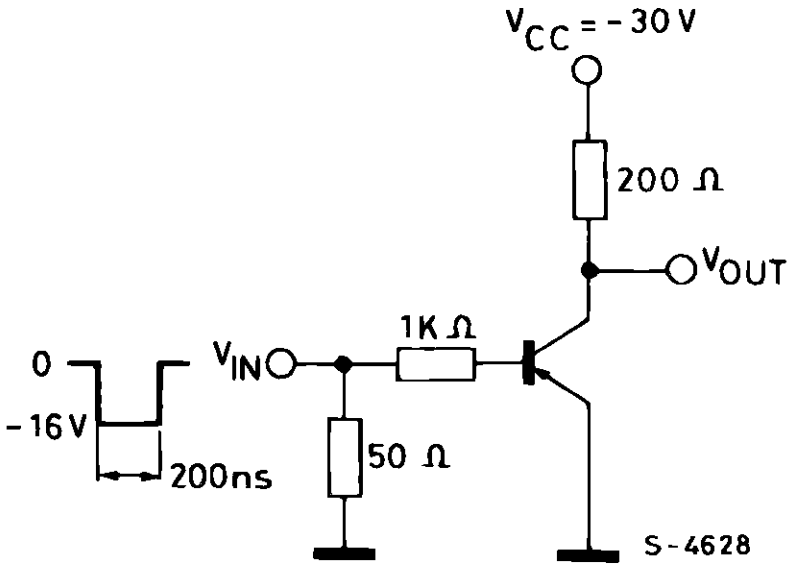
Collector-base and Emitter-base capacitances.



Switching Characteristics.



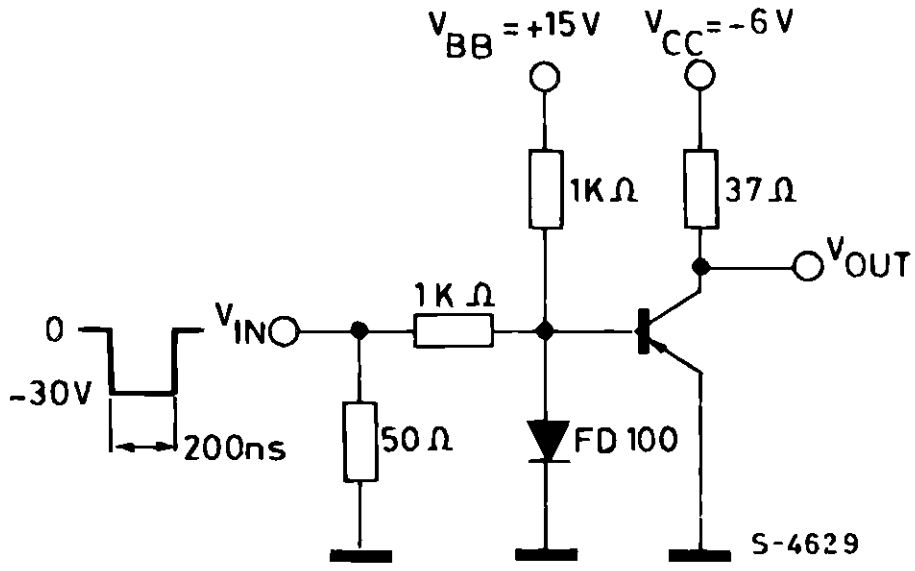
Test Circuit for t_{on}, t_r, t_d.



PULSE GENERATOR :
$t_r \leq 2.0$ ms
Frequency = 150 Hz
$Z_o = 50\ \Omega$

TO OSCILLOSCOPE :
$t_r < 5.0$ ns
$Z_{IN} > 10\ M\Omega$

Test Circuit for t_{off}, t_o, t_f.

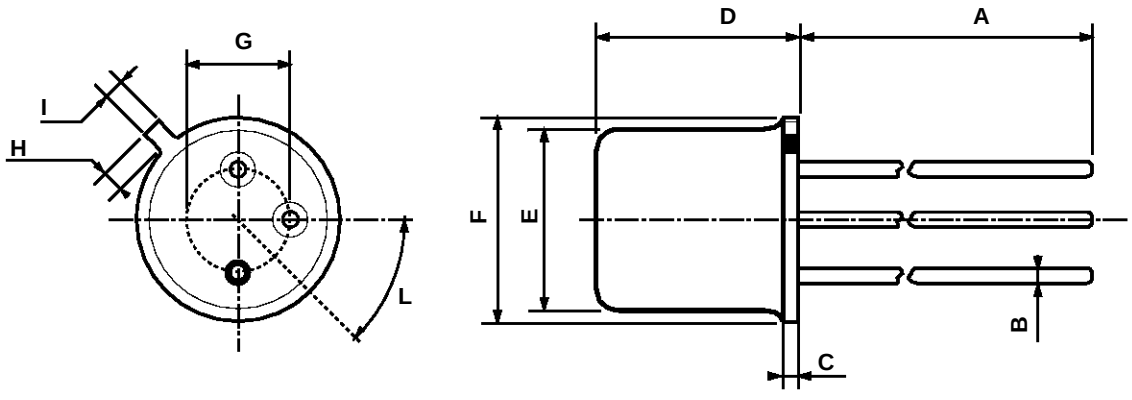


PULSE GENERATOR :
$t_r \leq 2.0$ ns
Frequency = 150 Hz
$Z_o = 50\ \Omega$

TO OSCILLOSCOPE :
$t_r < 5.0$ ns
$Z_{IN} > 100\ M\Omega$

TO-18 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		12.7			0.500	
B			0.49			0.019
D			5.3			0.208
E			4.9			0.193
F			5.8			0.228
G	2.54			0.100		
H			1.2			0.047
I			1.16			0.045
L	45^o			45^o		



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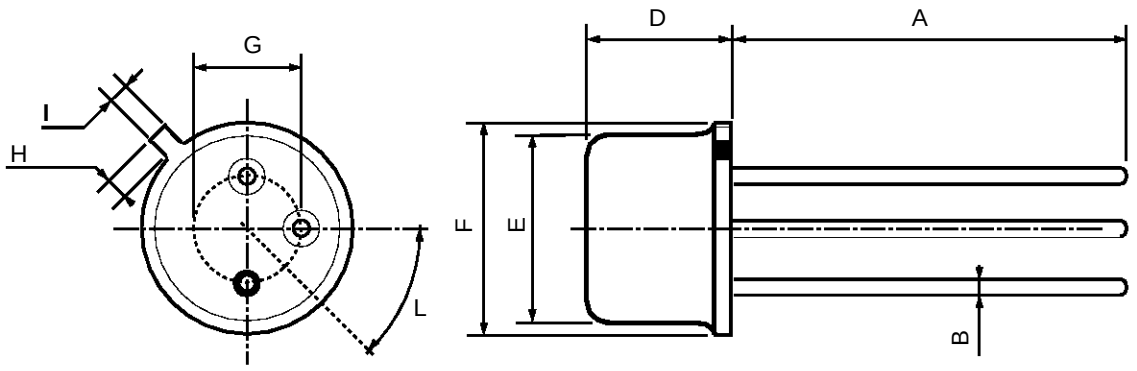
TO-39 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	12.7			0.500		
B			0.49			0.019
D			6.6			0.260
E			8.5			0.334
F			9.4			0.370
G	5.08			0.200		
H			1.2			0.047
I			0.9			0.035
L	45^{o} (typ.)					



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