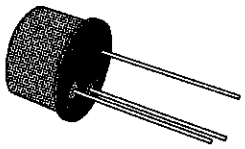
SGS-THOMSON MICROELECTRONICS

2N914

SATURATED LOGIC SWITCH AND VHF AMPLIFIER

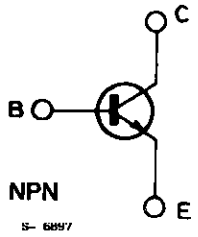
DESCRIPTION

The 2N914 is a silicon planar epitaxial NPN transistor in Jedec TO-18 metal case. It is primarily a universal switch but it is also an excellent high speed, high gain logic and memory driver at collector currents up to 500 mA.



TO-18

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base Voltage (I_E = 0)	40	V
V_{CER}	Collector-emitter Voltage ($R_{BE} \leq 10\ \Omega$)	20	V
V_{CEO}	Collector–emitter Voltage (I_B = 0)	15	V
V_{EBO}	Emitter–base Voltage (I_C = 0)	5	V
I_c	Collector Current	500	mA
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25$ °C at $T_{case} \leq 25$ °C at $T_{case} \leq 100$ °C	0.36 1.2 0.68	W W W
T_{stg}, T_j	Storage and Junction Temperature	– 65 to 200	°C

THERMAL DATA

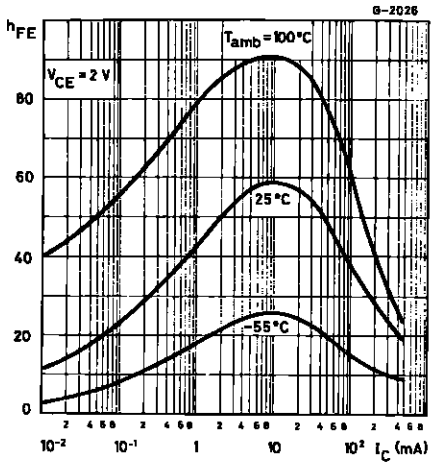
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max	146	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	486	°C/W

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C unless otherwise specified)

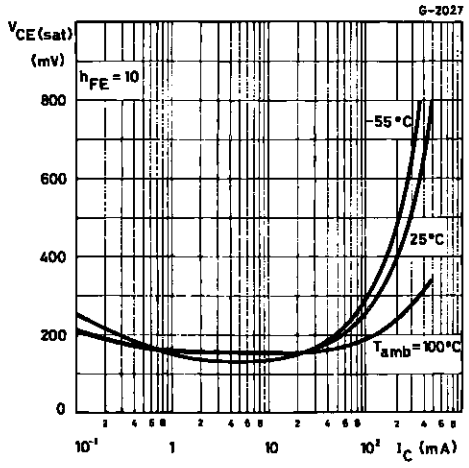
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current (I_E = 0)	V_{CB} = 20 V V_{CB} = 20 V T_{amb} = 150 °C			25 15	nA µA
I_{CEX}	Collector Cutoff Current (V_{BE} = – 0.25 V)	V_{CE} = 20 V T_{amb} = 125 °C			10	µA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 4 V			100	nA
$V_{(BR)CBO}$	Collector–base Breakdown Voltage (I_E = 0)	I_C = 1 µA	40			V
$V_{(BR)CES}$	Collector–emitter Breakdown Voltage ($R_{BE} \leq 10\ \Omega$)	I_C = 10 mA	20			V
$V_{(BR)CEO}$*	Collector–emitter Breakdown Voltage (I_B = 0)	I_C = 30 mA	15			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 = 20 mA I_B = 2 mA I_C = 200 mA I_B = 20 mA		0.2 0.4	0.25 0.7	V V
$V_{BE(sat)}$*	Base–emitter Saturation Voltage	I_C = 10 mA I_B = 1 mA	0.7	0.74	0.8	V
h_{FE}*	DC Current Gain	I_C = 10 mA V_{CE} = 1 V I_C = 500 mA V_{CE} = 5 V I_C = 10 mA V_{CE} = 1 V T_{amb} = – 55 °C	30 10 12	55 17 28	120	– – –
f_T	Transition Frequency	I_C = 20 mA V_{CE} = 10 V f = 100 MHz	300	370		MHz
C_{EBO}	Emitter–base Capacitance	I_C = 0 V_{EB} = 0.5 V f = 1 MHz			9	pF
C_{CBO}	Collector–base Capacitance	I_E = 0 V_{CB} = 10 V f = 1 MHz		4.5	6	pF
t_s	Storage Time	I_C = 20 mA V_{CC} = 5 V I_{B1} = – I_{B2} = 20 mA		13	20	ns
t_{on}	Turn–on Time	I_C = 200 mA V_{CC} = 5 V I_{B1} = 40 mA		25	40	ns
t_{off}	Turn–off Time	I_C = 200 mA V_{CC} = 5 V I_{B1} = 40 mA I_{B2} = – 20 mA		25	40	ns

* Pulsed : pulse duration = 300 µs, duty cycle = 1 %.

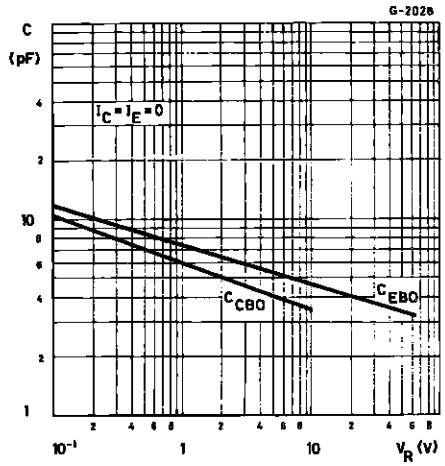
DC Current Gain.



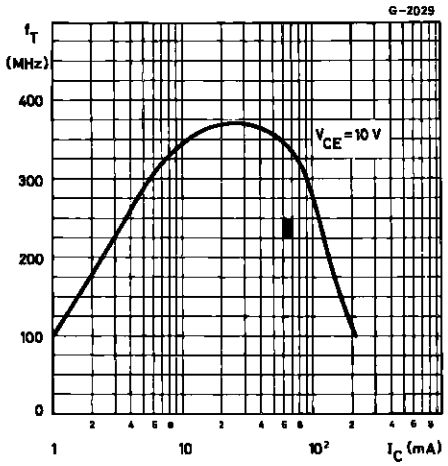
Collector-emitter Saturation Voltage.



Collector-base and Emitter-base Capacitances.

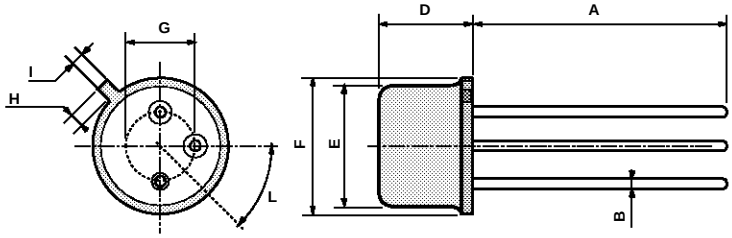


Transition Frequency.



TO39 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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