

SILICON POWER TRANSISTOR 2SA1645, 2SA1645-Z

PNP SILICON EPITAXIAL TRANSISTOR FOR HIGH-SPEED SWITCHING

The 2SA1645 is a mold power transistor developed for high-speed switching and features a very low collector-to-emitter saturation voltage. This transistor is ideal for use in switching power supplies, DC/DC converters, motor drivers, solenoid drivers, and other low-voltage power supply devices, as well as for high-current switching.

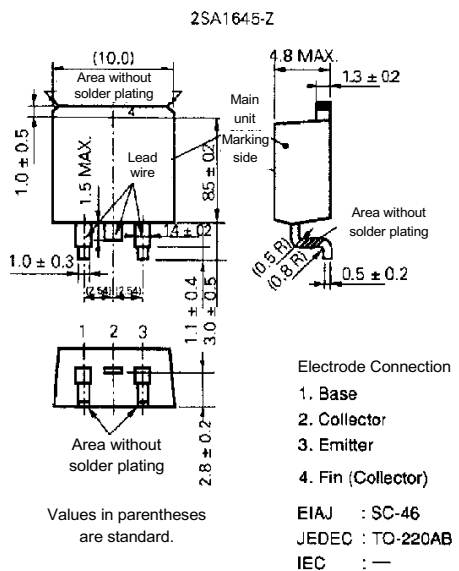
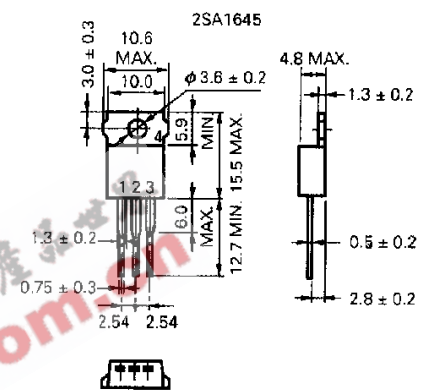
FEATURES

- Fast switching speed
- Low collector-to-emitter saturation voltage:
 $V_{CE(sat)} = -0.3 \text{ V MAX. @ } I_c = -4 \text{ A}$

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	Ratings	Unit
Collector to base voltage	V_{CBO}		-150	V
Collector to emitter voltage	V_{CEO}		-100	V
Emitter to base voltage	V_{EBO}		-7.0	V
Collector current	$I_{D(DC)}$		-7.0	A
Collector current	$I_{C(pulse)}$	$PW \leq 300 \mu\text{s}$, Duty Cycle $\leq 10\%$	-14	A
Base current	$I_{B(DC)}$		-3.5	A
Total power dissipation	P_T	$T_c = 25^\circ\text{C}$	35	W
Total power dissipation	P_T	$T_a = 25^\circ\text{C}$	1.5	W
Junction temperature	T_j		150	$^\circ\text{C}$
Storage temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

PACKAGE DRAWING (UNIT: mm)



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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

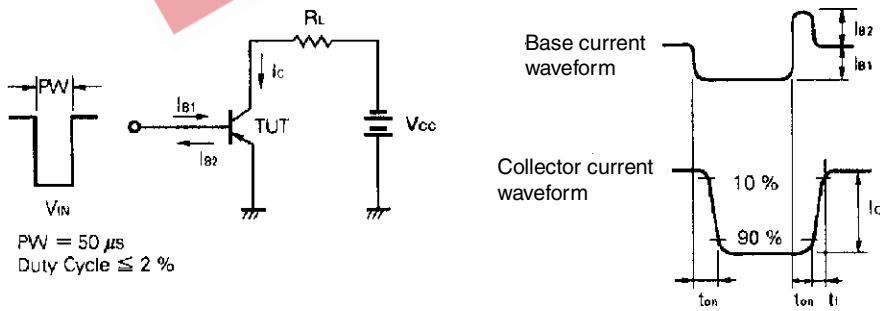
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = -100\text{ V}, I_E = 0$			-10	μA
Emitter cutoff current	I_{EBO}	$V_{EB} = -5\text{ V}, I_C = 0$			-10	μA
DC current gain	h_{FE1}^*	$V_{CE} = -2\text{ V}, I_C = -0.5\text{ A}$	100			-
DC current gain	h_{FE2}^*	$V_{CE} = -2\text{ V}, I_C = -1.5\text{ A}$	100		400	-
DC current gain	h_{FE3}^*	$V_{CE} = -2\text{ V}, I_C = -4\text{ A}$	60			-
Collector saturation voltage	$V_{CE(sat)1}^*$	$I_C = -4\text{ A}, I_B = -0.2\text{ A}$			-0.3	V
Collector saturation voltage	$V_{CE(sat)2}^*$	$I_C = -6\text{ A}, I_B = -0.3\text{ A}$			-0.5	V
Base saturation voltage	$V_{BE(sat)1}^*$	$I_C = -4\text{ A}, I_B = -0.2\text{ A}$			-1.2	V
Base saturation voltage	$V_{BE(sat)2}^*$	$I_C = -6\text{ A}, I_B = -0.3\text{ A}$			-1.5	V
Gain bandwidth product	f_T	$V_{CE} = -10\text{ V}, I_C = -1.5\text{ A}$		150		MHz
Collector capacitance	C_{ob}	$V_{CB} = -10\text{ V}, I_E = 0, f = 1\text{ MHz}$		150		pF
Turn-on time	t_{on}	$I_C = -4\text{ A}, I_{B1} = -I_{B2} = -0.2\text{ A},$ $R_L = 12.5\ \Omega, V_{CC} = -50\text{ V}$ Refer to the test circuit.		0.3		μs
Storage time	t_{stg}			1.5		μs
Fall time	t_f			0.4		μs

* Pulse test $PW \leq 350\ \mu\text{s}$, duty cycle $\leq 2\%$

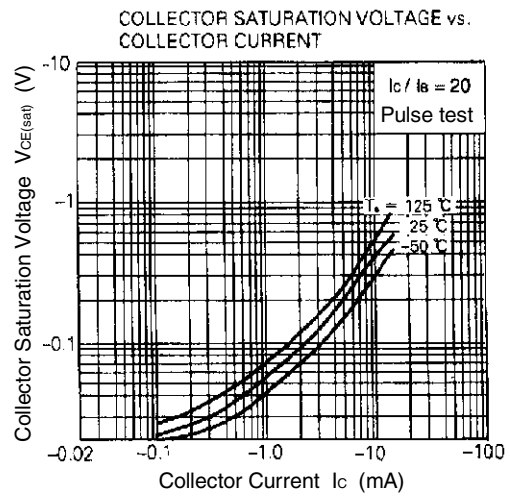
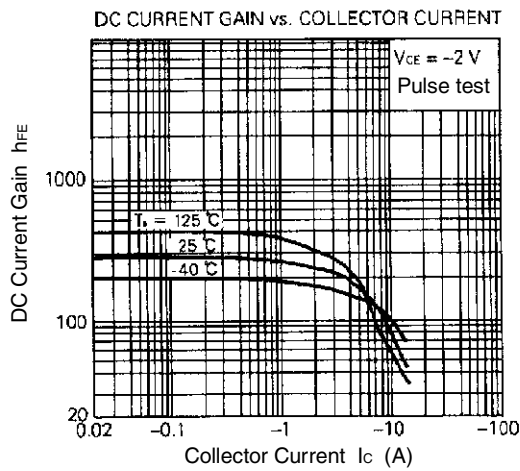
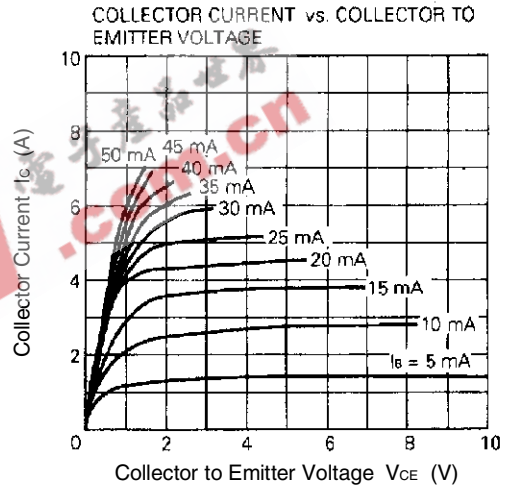
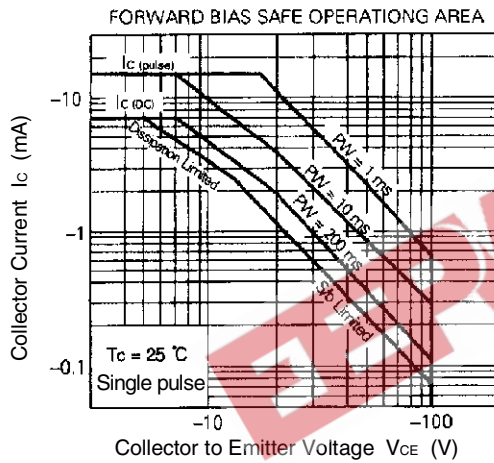
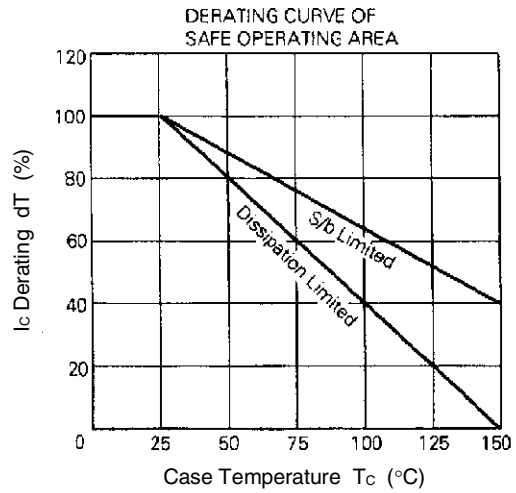
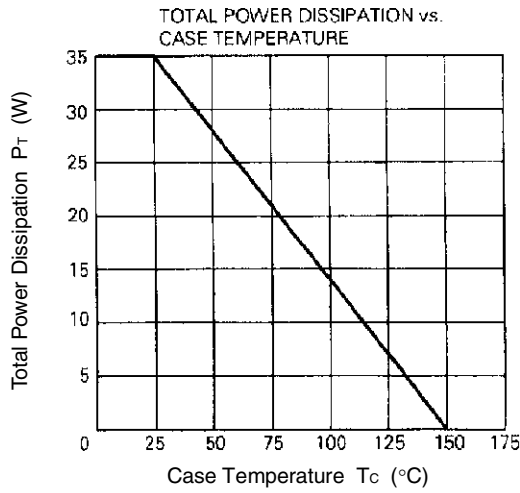
h_{FE} CLASSIFICATION

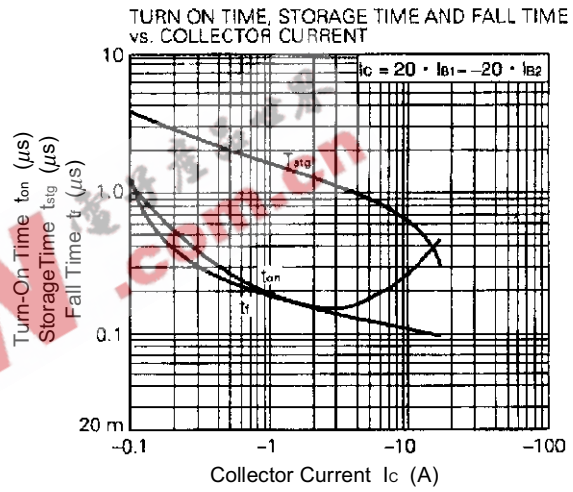
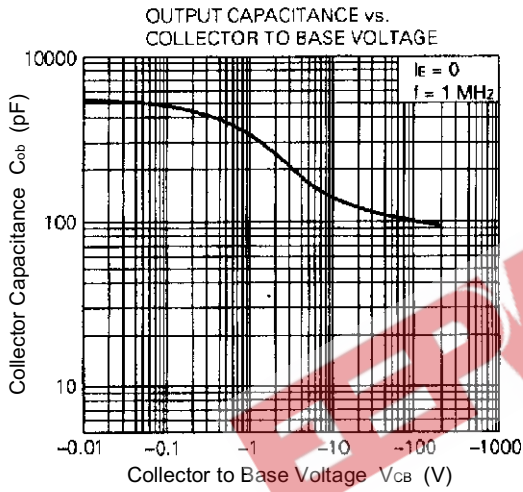
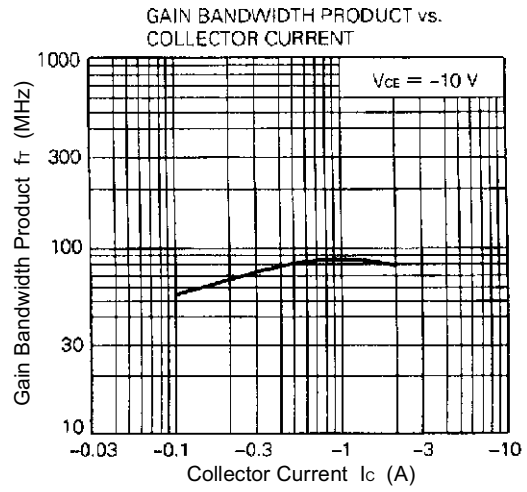
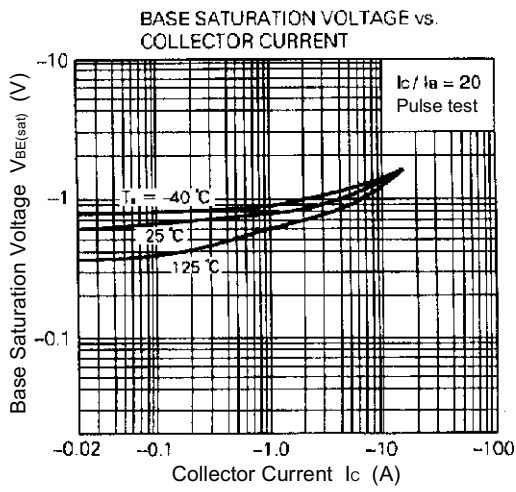
Marking	M	L	K
h_{FE2}	100 to 200	150 to 300	200 to 400

SWITCHING TIME TEST CIRCUIT



TYPICAL CHARACTERISTICS (Ta = 25°C)





[MEMO]



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