



13005BA

Preliminary

NPN SILICON TRANSISTOR

NPN SILICON POWER TRANSISTORS

DESCRIPTION

These devices are designed for high-voltage, high-speed power switching inductive circuits where fall time is critical. They are particularly suited for 115 and 220 V SWITCHMODE.

FEATURES

- * $V_{CEQ(SUS)} = 800\text{ V}$
- * Reverse bias SOA with inductive loads @ $T_C = 100^\circ\text{C}$
- * Inductive switching matrix 2 to 4 Amp, 25 and 100°C
 $t_c @ 3\text{A}, 100^\circ\text{C}$ is 180 ns (Typ)
- * 800V blocking capability
- * SOA and switching applications information

APPLICATIONS

- * Switching regulator's, inverters
- * Motor controls
- * Solenoid/Relay drivers
- * Deflection circuits

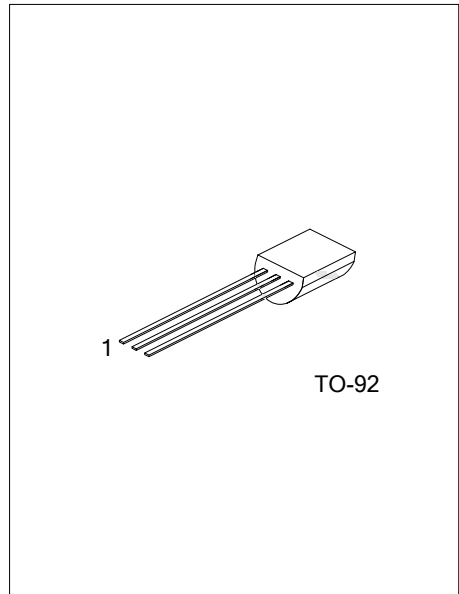
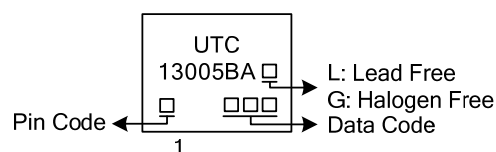
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
13005BAL-T92-A-B	13005BAG-T92-A-B	TO-92	E	C	B	Tape Box
13005BAL-T92-A-K	13005BAG-T92-A-K	TO-92	E	C	B	Bulk
13005BAL-T92-F-B	13005BAG-T92-F-B	TO-92	B	C	E	Tape Box
13005BAL-T92-F-K	13005BAG-T92-F-K	TO-92	B	C	E	Bulk

Note: Pin assignment: E: Emitter C: Collector B: Base

13005BAL-T92-A-B	(1)Packing Type (2)Pin Assignment (3)Package Type (4)Lead Free	(1) B: Bluk, K: Bulk (2) refer to Pin Assignment (3) T92: TO-92 (4) L: Lead Free, G: Halogen Free
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MARKING



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage		$V_{CEO(SUS)}$	400	V
Collector-Emitter Voltage ($V_{BE}=0$)		V_{CES}	800	V
Collector-Base Voltage		V_{CBO}	800	V
Emitter Base Voltage		V_{EBO}	9	V
Collector Current	Continuous	I_C	3	A
	Peak (1)	I_{CM}	8	A
Base Current	Continuous	I_B	2	A
	Peak (1)	I_{BM}	4	A
Emitter Current	Continuous	I_E	6	A
	Peak (1)	I_{EM}	12	A
Power Dissipation at $T_A=25^{\circ}\text{C}$		P_D	1	W
Junction Temperature		T_J	-65 ~ +150	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	-65 ~ +150	$^{\circ}\text{C}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	150	$^{\circ}\text{C/W}$
Junction to Case	θ_{JC}	112	$^{\circ}\text{C/W}$

■ ELECTRICAL CHARACTERISTICS ($T_C=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS (Note 1)						
Collector-Emitter Sustaining Voltage	V _{CEO(SUS)}	I _C =10mA , I _B =0	800			V
Collector Cutoff Current	I _{CBO}	V _{CBO} =Rated Value, V _{BE(OFF)} =1.5V			1	mA
		V _{CBO} =Rated Value, V _{BE(OFF)} =1.5V, T _C =100°C			5	
Emitter Cutoff Current	I _{EBO}	V _{EB} =9V, I _C =0			1	mA
ON CHARACTERISTICS (Note 1)						
DC Current Gain	h _{FE1}	I _C =0.5A, V _{CE} =5V	15		50	
	h _{FE2}	I _C =1A, V _{CE} =5V	10		60	
	h _{FE3}	I _C =2A, V _{CE} =5V	8		40	
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	I _C =1A, I _B =0.2A			0.5	V
		I _C =2A, I _B =0.5A			0.6	V
		I _C =4A, I _B =1A			1	V
		I _C =2A, I _B =0.5A, T _A =100°C			1	V
Base-Emitter Saturation Voltage	V _{BE(SAT)}	I _C =1A, I _B =0.2A			1.2	V
		I _C =2A, I _B =0.5A			1.6	V
		I _C =2A, I _B =0.5A, T _C =100°C			1.5	V
DYNAMIC CHARACTERISTICS						
Current-Gain-Bandwidth Product	f _T	I _C =500mA, V _{CE} =10V, f=1MHz	4			MHz
Output Capacitance	C _{OB}	V _{CB} =10V, I _E =0, f=0.1MHz		65		pF
SWITCHING CHARACTERISTICS						
Resistive Load (Table 1)						
Delay Time	t _D	V _{CC} =125V, I _C =2A, I _{B1} =I _{B2} =0.4A, t _P =25μs, Duty Cycle≤1%		0.025	0.1	μs
Rise Time	t _R			0.3	0.7	μs
Storage Time	t _S			1.7	4	μs
Fall Time	t _F			0.4	0.9	μs

Notes: 1. Pulse Test: Pulse Width=5ms, Duty Cycle $\leq 10\%$

2. Pulse Test: $P_W=300\mu\text{s}$, Duty Cycle $\leq 2\%$

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