

**isc Silicon NPN Power Transistor**

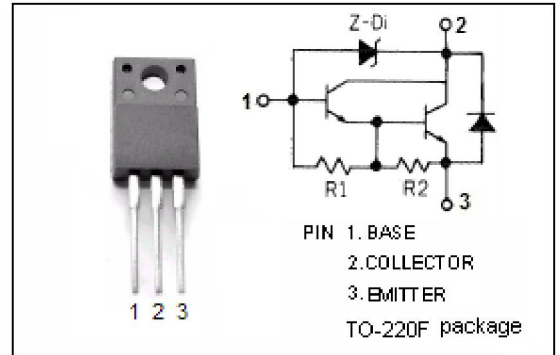
**2SC4005**

**DESCRIPTION**

- High DC current gain.
- Large current capacity and wide ASO.
- On-chip Zener diode of  $50 \pm 8V$  between collector and base.
- Large inductive load handling capability.
- Micaless package facilitating mounting.

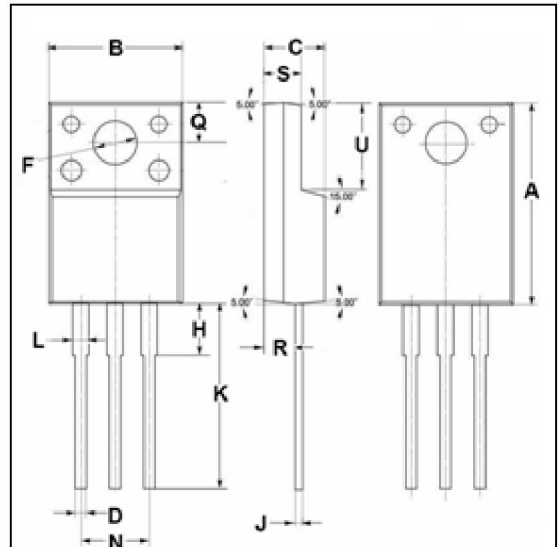
**APPLICATIONS**

- Designed for use in switching of L load (motor drivers, printer hammer drivers, relay drivers).



**ABSOLUTE MAXIMUM RATINGS( $T_a=25^\circ C$ )**

SYMBOL	PARAMETER	VALUE	UNIT
$V_{CBO}$	Collector-Base Voltage	42	V
$V_{CEO}$	Collector-Emitter Voltage	42	V
$V_{EBO}$	Emitter-Base Voltage	6	V
$I_C$	Collector Current-Continuous	2	A
$I_{CM}$	Collector Current-Pulse	4	A
$I_B$	Base Current-Continuous	0.4	A
$P_T$	Total Power Dissipation @ $T_C=25^\circ C$	15	W
	Total Power Dissipation @ $T_a=25^\circ C$	2.0	
$T_J$	Junction Temperature	150	$^\circ C$
$T_{stg}$	Storage Temperature	-55~150	$^\circ C$



DIM	mm	
	MIN	MAX
A	14.95	15.05
B	10.00	10.10
C	4.40	4.60
D	0.75	0.80
F	3.10	3.30
H	3.70	3.90
J	0.50	0.70
K	13.4	13.6
L	1.10	1.30
N	5.00	5.20
Q	2.70	2.90
R	2.20	2.40
S	2.65	2.85
U	6.40	6.60

## isc Silicon NPN Power Transistor

## 2SC4005

## ELECTRICAL CHARACTERISTICS

T<sub>j</sub>=25°C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
V <sub>CEO</sub>	Collector-Emitter Voltage	I <sub>C</sub> =1mA; R <sub>BE</sub> =∞	42		58	V
V <sub>CBO</sub>	Collector-Emitter Sustaining Voltage	I <sub>C</sub> = 0.1mA; I <sub>B</sub>	60			V
V <sub>CE(sat)-1</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 4A; I <sub>B</sub> = 0.2A			0.3	V
V <sub>CE(sat)-2</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 6A; I <sub>B</sub> = 0.3A			0.5	V
V <sub>BE(sat)-1</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 4A; I <sub>B</sub> = 0.2A			1.2	V
V <sub>BE(sat)-2</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 6A; I <sub>B</sub> = 0.3A			1.5	V
I <sub>CBO</sub>	Collector Cutoff Current	V <sub>CB</sub> = 60V; I <sub>E</sub> = 0			10	μ A
I <sub>CER</sub>	Collector Cutoff Current	V <sub>CE</sub> = 60V; R <sub>BE</sub> = 50 Ω, T <sub>a</sub> =125°C			1.0	mA
I <sub>CEx</sub>	Collector Cutoff Current	V <sub>CE</sub> = 60V; V <sub>BE(off)</sub> = -1.5V V <sub>CE</sub> = 60V; V <sub>BE(off)</sub> = -1.5V, T <sub>a</sub> =125°C			10 1.0	μ A mA
I <sub>EBO</sub>	Emitter Cutoff Current	V <sub>EB</sub> = 5V; I <sub>C</sub> = 0			10	μ A
h <sub>FE-1</sub>	DC Current Gain	I <sub>C</sub> = 0.7A; V <sub>CE</sub> = 2V	100			
h <sub>FE-2</sub>	DC Current Gain	I <sub>C</sub> = 1.5A; V <sub>CE</sub> = 2V	100		400	
h <sub>FE-3</sub>	DC Current Gain	I <sub>C</sub> = 4.0A; V <sub>CE</sub> = 2V	60			
C <sub>OB</sub>	Output Capacitance	I <sub>E</sub> = 0; V <sub>CB</sub> = 10V; f= 1.0MHz		100		pF
f <sub>T</sub>	Current-Gain—Bandwidth Product	I <sub>C</sub> = 1A; V <sub>CE</sub> = 10V		150		MHz

## Switching times

t <sub>on</sub>	Turn-on Time	I <sub>C</sub> = 4.0A, R <sub>L</sub> = 12.5 Ω, I <sub>B1</sub> = -I <sub>B2</sub> = 0.2A, V <sub>CC</sub> ≈ 50V			0.3	μ s
t <sub>stg</sub>	Storage Time				1.5	μ s
t <sub>f</sub>	Fall Time				0.3	μ s

◆ h<sub>FE-2</sub> Classifications

M	L	K
100-200	150-300	200-400