

# 2SD647A 2SD697A

## SILICON NPN TRIPLE DIFFUSED MESA TYPE (DARLINGTON POWER)

### INDUSTRIAL APPLICATIONS

Unit in mm

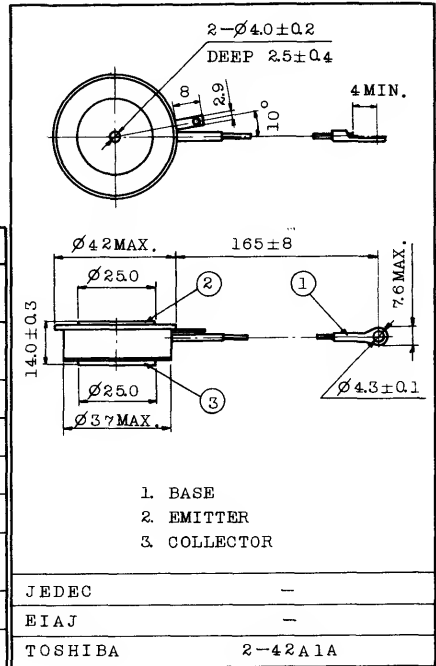
HIGH POWER SWITCHING APPLICATIONS.  
DC-AC POWER INVERTER APPLICATIONS.  
MOTOR CONTROL APPLICATIONS.

#### FEATURES:

- High Voltage :  $V_{CE0(SUS)} \geq 450V$  (2SD697A)
- Triple Diffused Design.
- Darlington Design.

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage	2SD647A	$V_{CBO}$	800	V
	2SD697A		500	
Collector-Emitter Voltage	2SD647A	$V_{CE0(SUS)}$	600	V
	2SD697A		450	
Emitter-Base Voltage		$V_{EBO}$	5	V
Collector Current		$I_C$	100	A
Emitter Current		$I_E$	-100	A
Base Current		$I_B$	6	A
Thermal Resistance (Double Side Cooling)		$R_{th(j-c)}$	0.13	$^\circ C/W$
Junction Temperature		$T_j$	125	$^\circ C$
Storage Temperature Range		$T_{stg}$	-40 ~ 150	$^\circ C$
Mounting Force Required		F	400 $\pm$ 40	kg



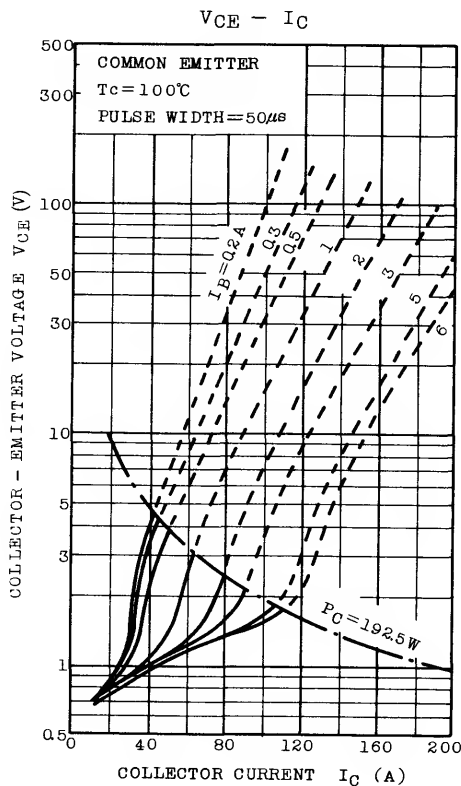
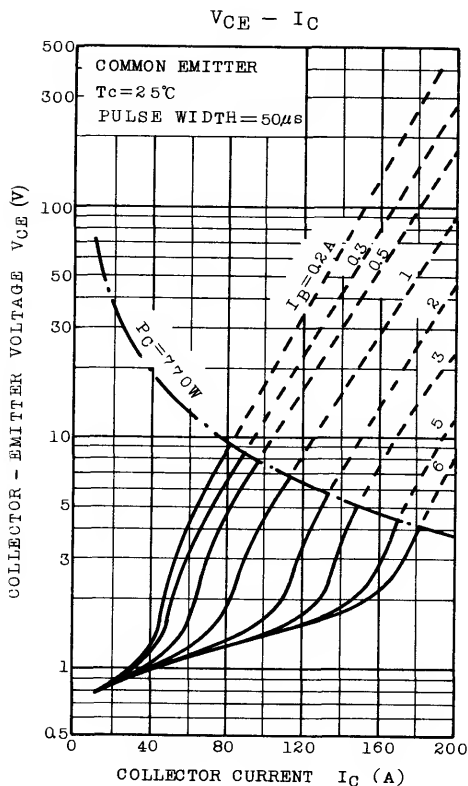
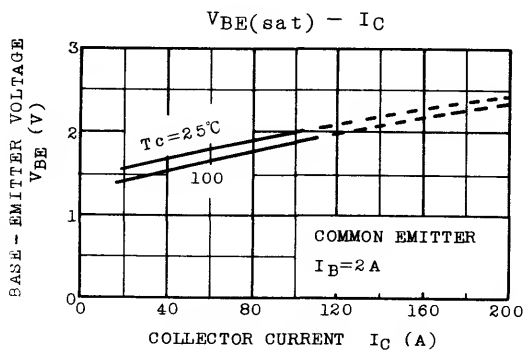
Weight : 70g

#### ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ C$ )

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
DC Current Gain		$h_{FE}$	$V_{CE}=5V, I_C=100A$	100	-	-	
			$V_{CE}=5V, I_C=50A$	-	500	-	
Collector-Emitter Sustaining Voltage	2SD647A 2SD697A	$V_{CE0(SUS)}$	$I_C=0.5A, L=40mH$	600 450	-	-	V
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	$I_C=100A, I_B=2A$ (Note)	-	-	2.0	V
Base-Emitter Saturation Voltage		$V_{BE(sat)}$		-	-	2.5	V
Collector Cut-off Current	2SD647A	$I_{CBO}$	$V_{CB}=800V, I_E=0$	-	-	2	mA
	2SD697A		$V_{CB}=500V, I_E=0$	-	-	2	
Emitter Cut-off Current		$I_{EBO}$	$V_{EB}=5V, I_C=0$	-	-	200	mA
Switching Time	Turn-on Time	$t_{on}$	$I_C=100A, I_{B1}=2A, -I_{B2}=2A, V_C=300V$	-	2.5	-	$\mu s$
	Storage Time	$t_{stg}$		-	20	-	$\mu s$
	Fall Time	$t_f$		-	4	-	$\mu s$

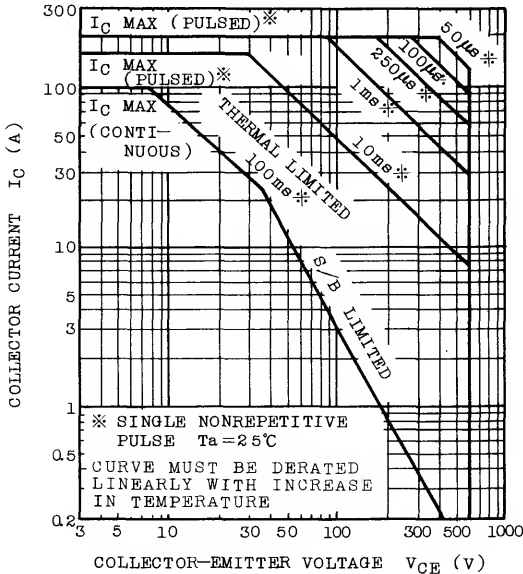
Note : Pulse Test; Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 3\%$   
Mounting Force; F=400kg

TOSHIBA CORPORATION

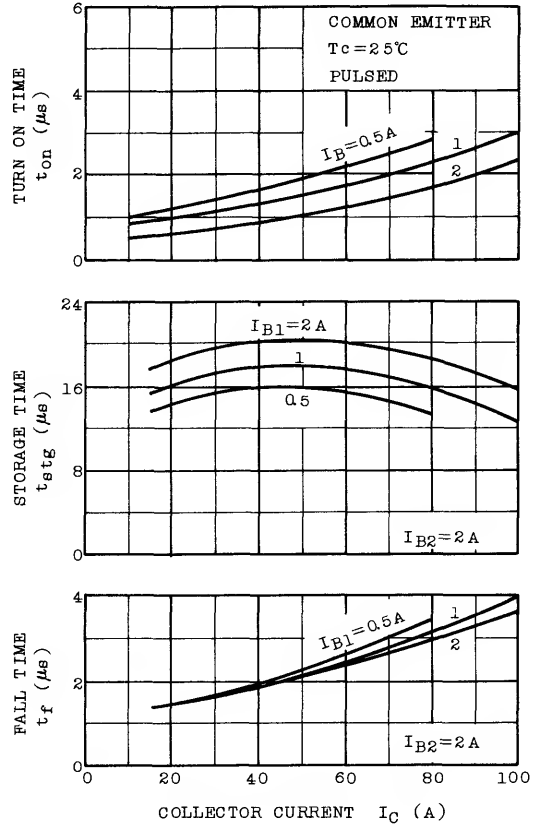


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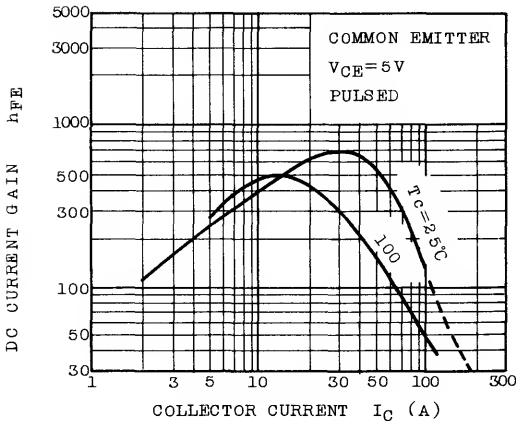
SAFE OPERATING AREA



SWITCHING CHARACTERISTICS



$h_{FE} - I_C$



MAXIMUM TRANSIENT THERMAL IMPEDANCE (JUNCTION - CASE)

