

TOSHIBA TRANSISTOR SILICON NPN TRIPLE DIFFUSED TYPE

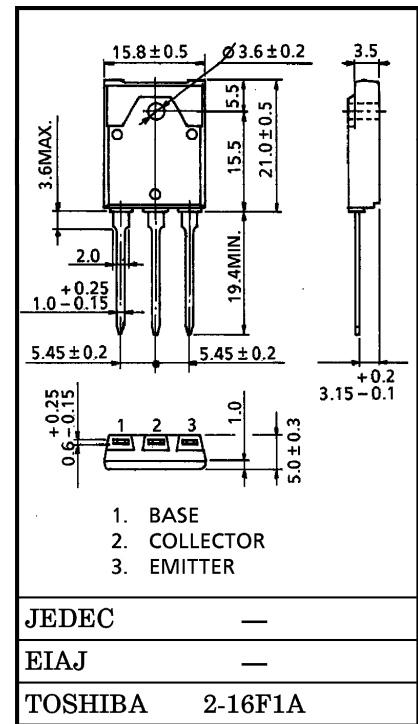
# 2SD2440

**SWITCHING APPLICATION**

- High Breakdown Voltage :  $V_{CB0} = 100 \text{ V (MIN.)}$   
:  $V_{EB0} = 18 \text{ V (MIN.)}$
- Low Saturation Voltage :  $V_{CE(sat)} = 1.2 \text{ V (MAX.)}$   
( $I_C = 5 \text{ A}, I_B = 1 \text{ A}$ )
- High Speed :  $t_f = 1 \mu\text{s (TYP.)}$  ( $I_C = 5 \text{ A}, I_B = \pm 0.5 \text{ A}$ )
- High DC Current Gain  
:  $h_{FE} = 200 \text{ (MIN.)}$  ( $V_{CE} = 5 \text{ V}, I_C = 0.5 \text{ A}$ )

**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CB0}$	100	V
Collector-Emitter Voltage	$V_{CEO}$	60	V
Emitter-Base Voltage	$V_{EBO}$	18	V
Collector Current	DC	$I_C$	6 A
	Pulse	$I_{CP}$	12 A
Base Current	$I_B$	2	A
Collector Power Dissipation (Tc = 25°C)	$P_C$	40	W
Junction Temperature	$T_j$	150	°C
Storage Temperature Range	$T_{stg}$	-55~150	°C



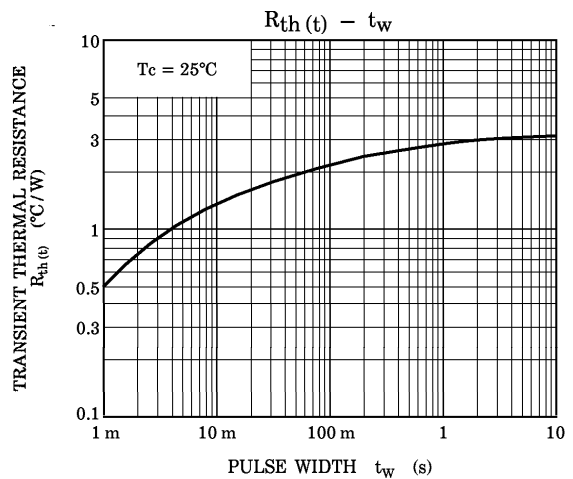
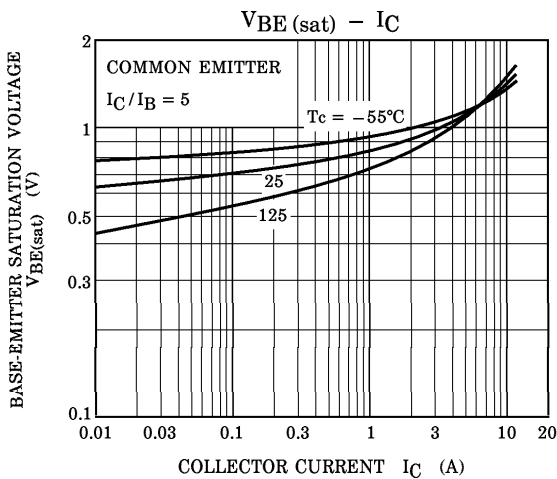
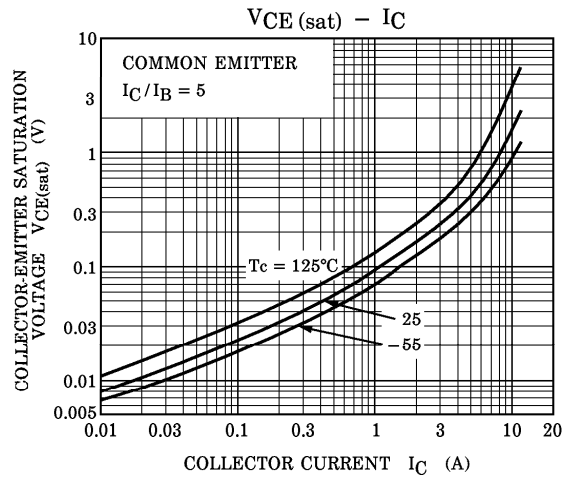
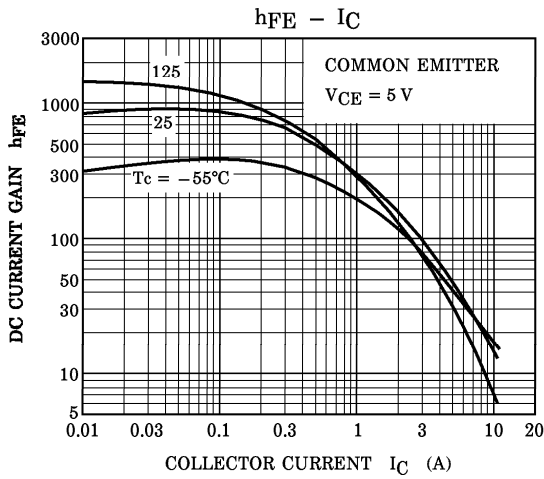
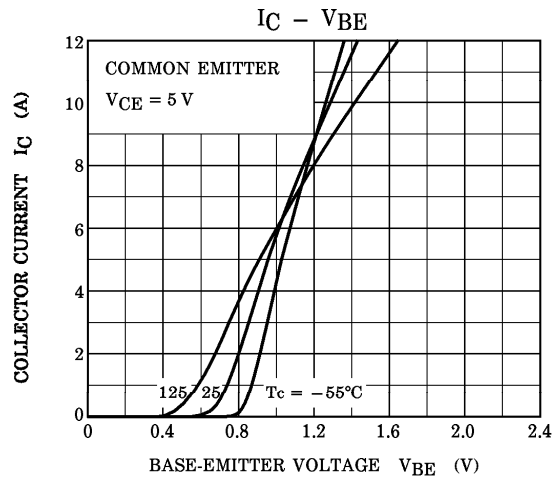
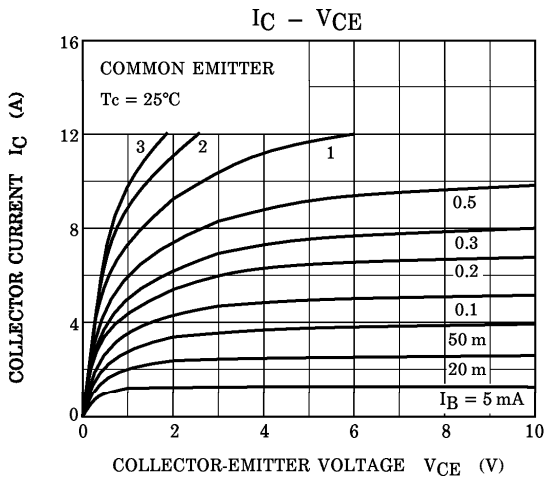
**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = 100 \text{ V}, I_E = 0$	—	—	10	$\mu\text{A}$
Collector Cut-off Current	$I_{CER}$	$V_{CE} = 80 \text{ V}, R_{BE} = 50 \Omega$	—	—	5	mA
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = 15 \text{ V}, I_C = 0$	—	—	2	$\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{CEO}$	$I_C = 50 \text{ mA}, I_B = 0$	60	—	—	V
DC Current Gain	$h_{FE(1)}$ (Note)	$V_{CE} = 5 \text{ V}, I_C = 0.5 \text{ A}$	200	—	900	
	$h_{FE(2)}$	$V_{CE} = 5 \text{ V}, I_C = 5 \text{ A}$	20	—	100	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 5 \text{ A}, I_B = 1 \text{ A}$	—	—	1.2	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 5 \text{ A}, I_B = 1 \text{ A}$	—	—	2.5	V
Transition Frequency	$f_T$	$V_{CE} = 10 \text{ V}, I_C = 0.5 \text{ A}$	—	5	—	MHz
Collector Output Capacitance	$C_{ob}$	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$	—	71	—	pF
Switching Time	Turn-On Time	$t_{on}$	—	1	2	$\mu\text{s}$
	Storage Time	$t_{stg}$	—	2	4	
	Fall Time	$t_f$	—	1	3	

(Note) :  $h_{FE(1)}$  Classification GR : 200~400, BL : 300~600, V : 450~900

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