

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

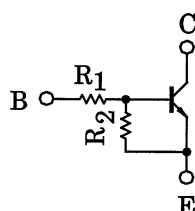
RN1314,RN1315,RN1316 RN1317,RN1318

Switching, Inverter Circuit, Interface Circuit
And Driver Circuit Applications

Unit: mm

- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN2314~RN2318

Equivalent Circuit and Bias Resister Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN1314	1	10
RN1315	2.2	10
RN1316	4.7	10
RN1317	10	4.7
RN1318	47	10

1. BASE	
2. EMITTER	
3. COLLECTOR	
USM	
JEDEC	—
EIAJ	SC-70
TOSHIBA	2-2E1A

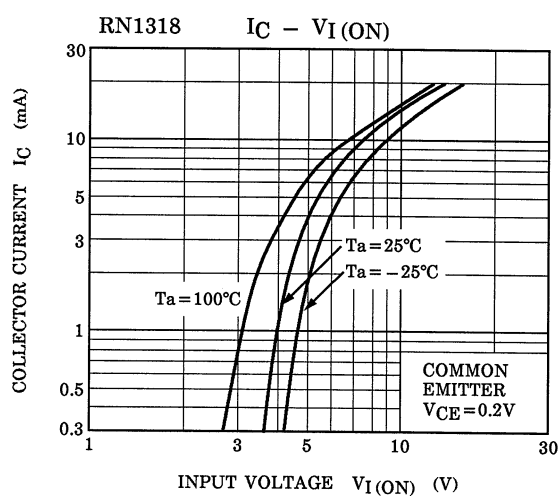
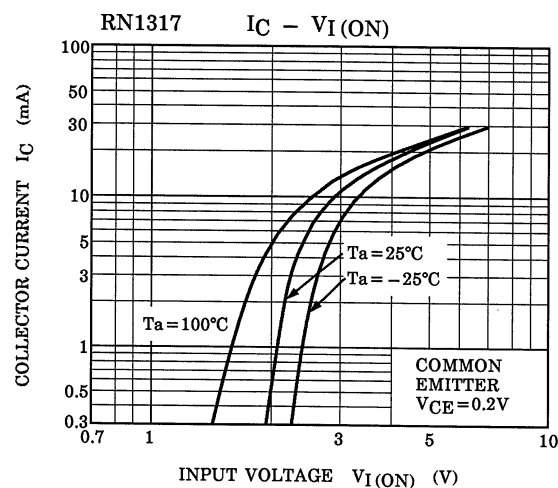
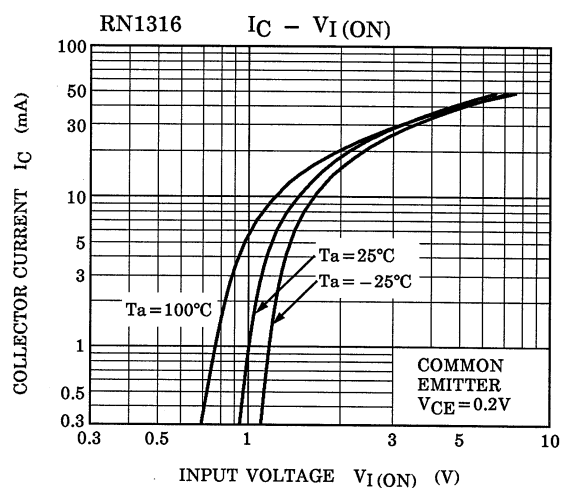
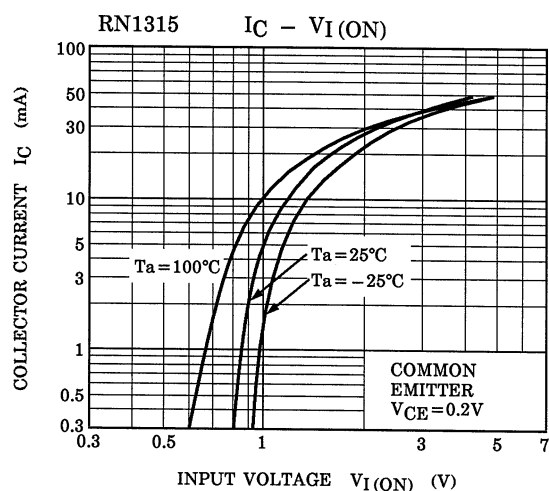
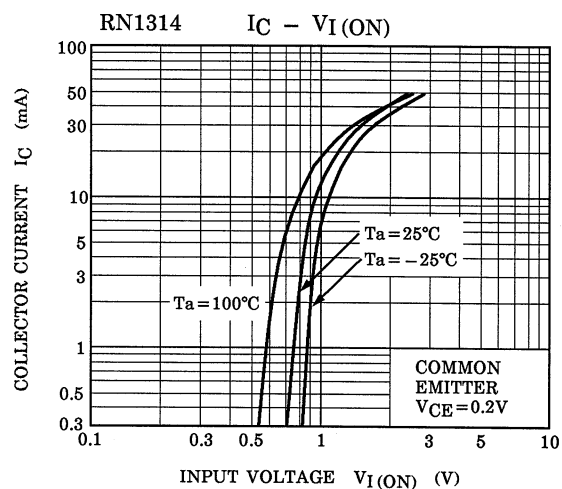
Weight: 0.006g

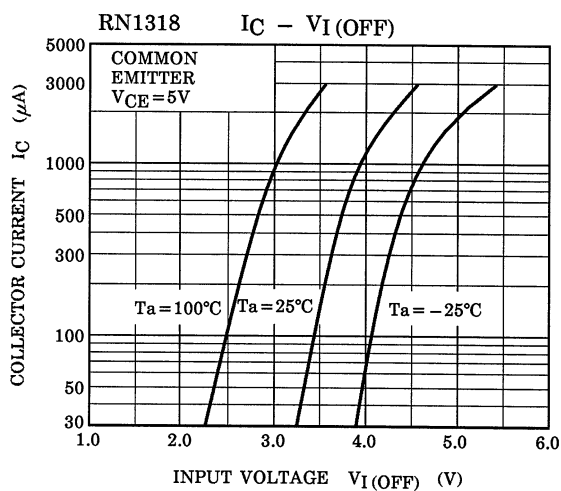
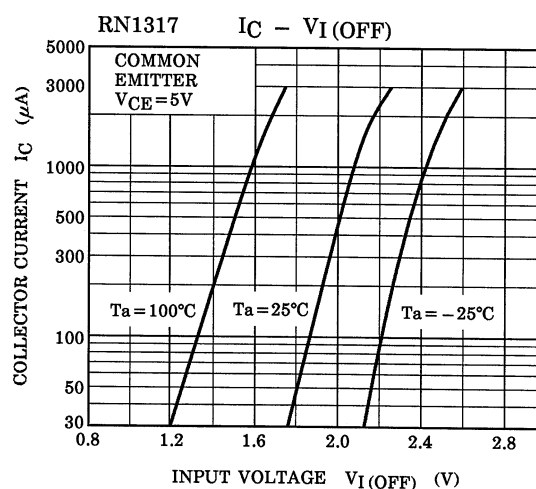
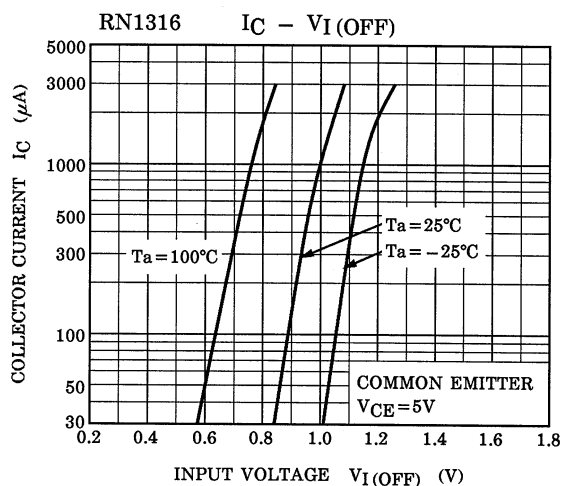
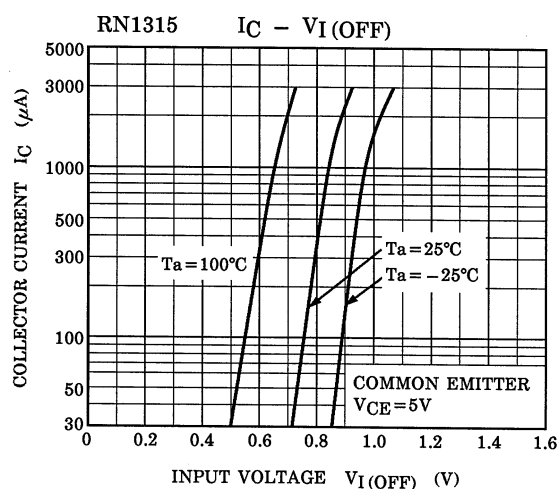
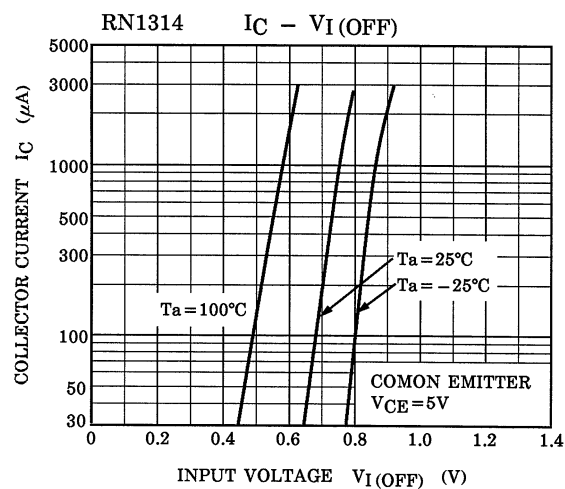
Maximum Ratings (Ta = 25°C)

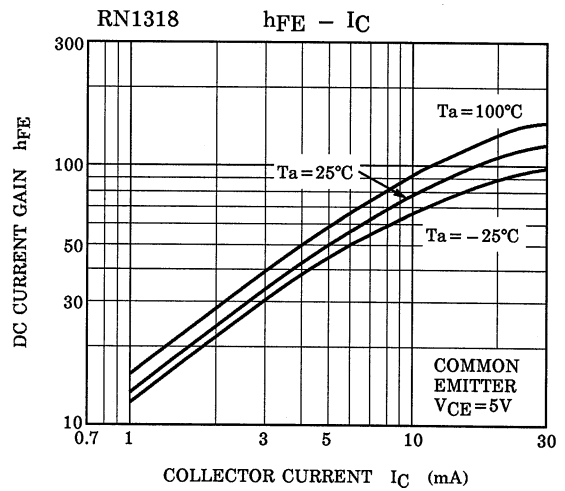
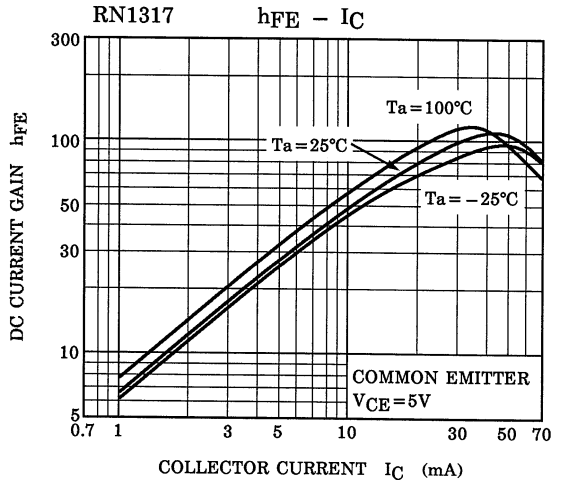
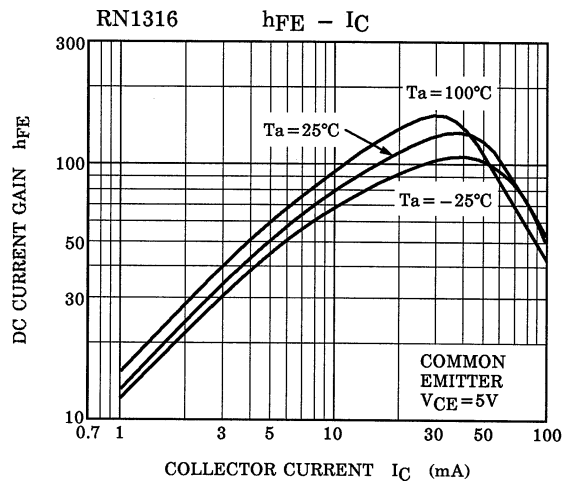
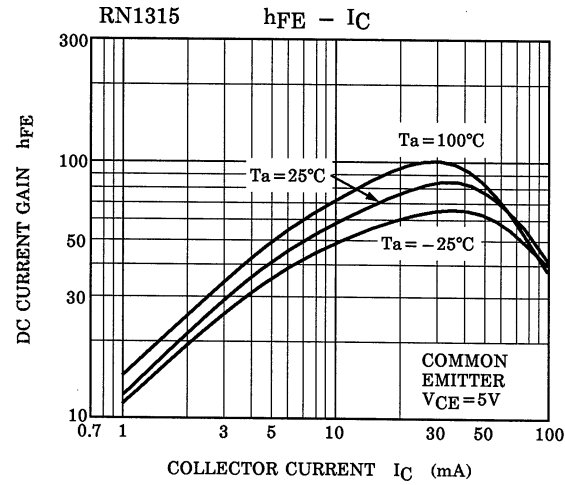
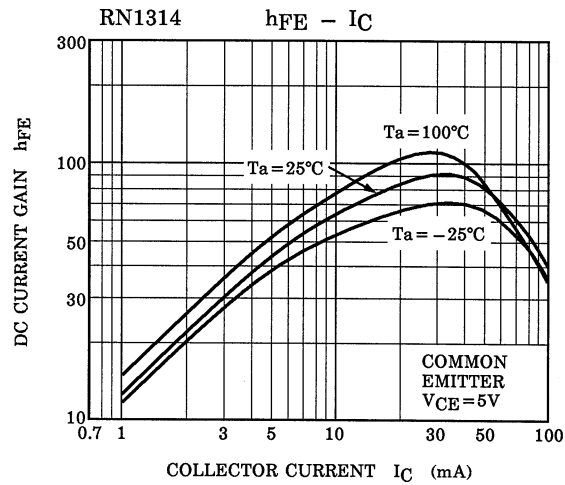
Characteristic	Symbol	Rating	Unit
Collector-base voltage	RN1314~1318	V _{CB0}	50
Collector-emitter voltage		V _{CEO}	50
Emitter-base voltage	RN1314	V _{EBO}	5
	RN1315		6
	RN1316		7
	RN1317		15
	RN1318		25
Collector current	RN1314~1318	I _C	100
Collector power dissipation		P _C	100
Junction temperature		T _j	150
Storage temperature range		T _{stg}	-55~150

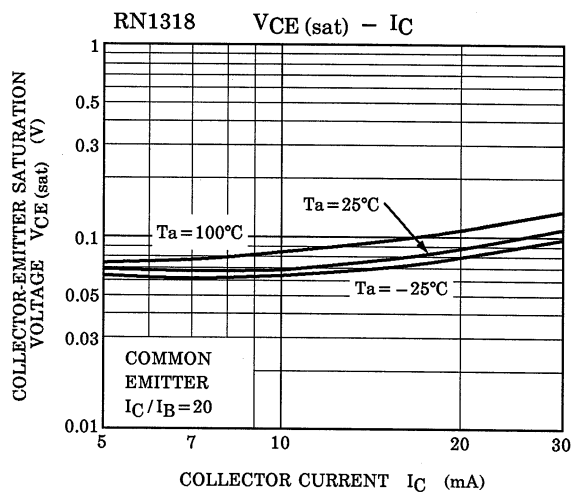
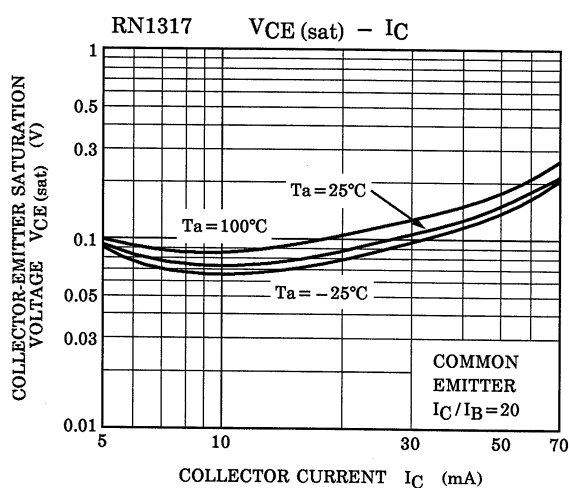
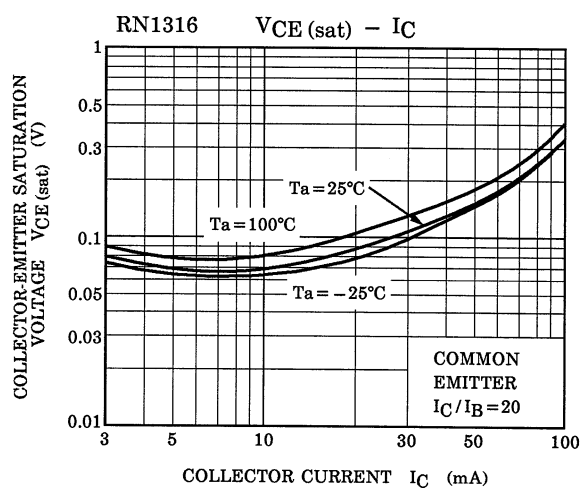
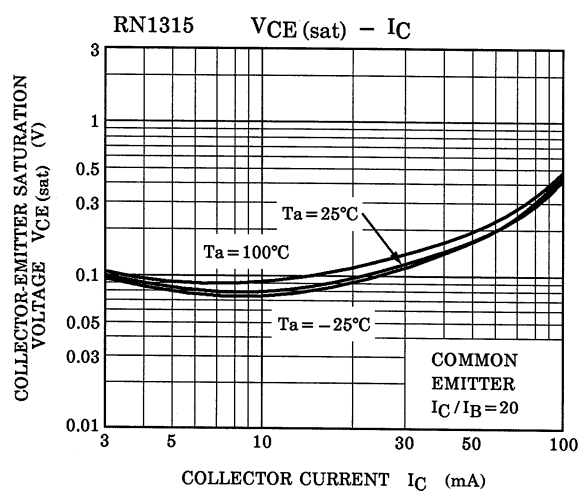
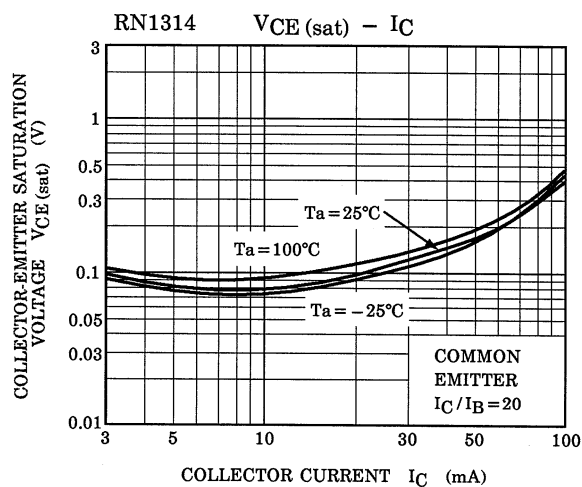
Electrical Characteristics (Ta = 25°C)

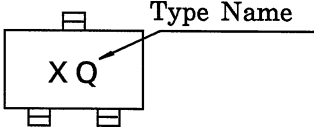
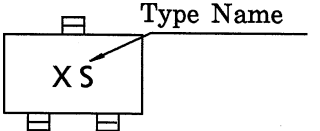
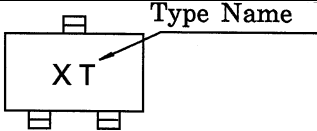
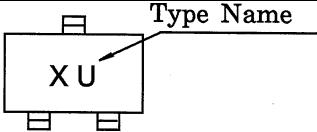
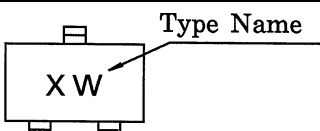
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN1314~1318	I_{CBO}	—	$V_{CB} = 50V, I_E = 0$	—	—	100	nA
	RN1314~1318	I_{CEO}		$V_{CE} = 50V, I_B = 0$	—	—	500	nA
Emitter cut-off current	RN1314	I_{EBO}	—	$V_{EB} = 5V, I_C = 0$	0.35	—	0.65	mA
	RN1315			$V_{EB} = 6V, I_C = 0$	0.37	—	0.71	
	RN1316			$V_{EB} = 7V, I_C = 0$	0.36	—	0.68	
	RN1317			$V_{EB} = 15V, I_C = 0$	0.78	—	1.46	
	RN1318			$V_{EB} = 25V, I_C = 0$	0.33	—	0.63	
DC current gain	RN1314~16,18	h_{FE}	—	$V_{CE} = 5V, I_C = 10mA$	50	—	—	
	RN1317				30	—	—	
Collector-emitter saturation voltage	RN1314~1318	$V_{CE(sat)}$	—	$I_C = 5mA, I_B = 0.25mA$	—	0.1	0.3	V
Input voltage (ON)	RN1314	$V_{I(ON)}$	—	$V_{CE} = 0.2V, I_C = 5mA$	0.6	—	2.0	V
	RN1315				0.7	—	2.5	
	RN1316				0.8	—	2.5	
	RN1317				1.5	—	3.5	
	RN1318				2.5	—	10.0	
Input voltage (OFF)	RN1314	$V_{I(OFF)}$	—	$V_{CE} = 5V, I_C = 0.1mA$	0.3	—	0.9	V
	RN1315				0.3	—	1.0	
	RN1316				0.3	—	1.1	
	RN1317				0.3	—	2.3	
	RN1318				0.5	—	5.7	
Transition frequency	RN1314~1318	f_T	—	$V_{CE} = 10V, I_C = 5mA$	—	250	—	MHz
Collector Output capacitance	RN1314~1318	C_{ob}	—	$V_{CB} = 10V, I_E = 0, f = 1MHz$	—	3.0	6.0	pF
Input resistor	RN1314	R_1	—	—	0.7	1.0	1.3	kΩ
	RN1315				1.54	2.2	2.86	
	RN1316				3.29	4.7	6.11	
	RN1317				7.0	10.0	13.0	
	RN1318				32.9	47.0	61.1	
Resistor ratio	RN1314	R_1/R_2	—	—	—	0.1	—	
	RN1315				—	0.22	—	
	RN1316				—	0.47	—	
	RN1317				—	2.13	—	
	RN1318				—	4.7	—	









Type Name	Marking
RN1314	
RN1315	
RN1316	
RN1317	
RN1318	

RESTRICTIONS ON PRODUCT USE

000707EAA

- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.