

Horizontal – Deflection – Output Power Transistors

February 2005

TOSHIBA CORPORATION
Semiconductor Company
Discrete Semiconductor Division

High Voltage TR for TV / Monitor

1. Progressive/ High Vision/Digital TV

	Part Number	Max. Rating			Display size & Frequency	Device Outline	Sample	MP
		V _{CBO} (V)	I _C (A)	P _C (W)				
	2SC5716	1700	8	55	24 to 32inch / to 31.5 kHz	with high speed dumper diode(31.5kHz)	OK	OK
NEW !	2SC6041	1700	15	70	24 to 36 inch / to 45kHz	New generation of 2SC5588	OK	OK
NEW !	2SC5857	1700	21	75	28 to 36 inch / to 45 kHz	New generation of 2SC5588(High current)	OK	OK
NEW !	2SC5858	1700	22	200	32 to 36 inch / to 45 kHz	New generation of 2SC5590(High Current)	OK	OK
	2SC5859	1700	23	200	32 to 36 inch / to 45 kHz	New generation of 2SC5446(High Current)	OK	OK
NEW !	2SC5997	2000	14	75	28 to 32 inch / to 45 kHz	TO-3P(H)IS version of VCBO=2000V TR	OK	OK
	2SC5748	2000	16	210	28 to 36 inch / to 45 kHz	High current version of VCBO=2000V TR	OK	OK

2. Color TV (Conventional)

	Part Number	Max. Rating			Display size & Frequency	Device Outline	Sample	MP
		V _{CBO} (V)	I _C (A)	P _C (W)				
	2SD2638	1700	7	50	24 to 32 inch / 15.75 kHz	New generation of 2SD2553	OK	OK

3. PC Monitor (CRT)

	Part Number	Max. Rating			Display size & Frequency	Device Outline	Sample	MP
		V _{CBO} (V)	I _C (A)	P _C (W)				
	2SC5717	1500	21	75	19 inch / to 120 kHz	TO-3P(H)IS version of 2SC5445	OK	OK
	2SC5695	1500	22	200	21inch / to 130 kHz	New genetaiton of 2SC5445	OK	OK
	2SC5859	1700	23	210	19 inch / to 100 kHz	New generation of 2SC5446(High Current)	OK	OK
NEW !	2SC5855	1500	10	50	17 inch / to 69 kHz	New generation of 2SC5387	OK	OK
NEW !	2SC5856	1500	14	55	19 inch / to 92 kHz	New generation of 2SC5411	OK	OK

2SC... & 2SD... : Fourth Generation

2SC... : Fifth generation

Line up (by Voltage & Current)

	V _{CBO} =1500V			V _{CBO} =1700V			V _{CBO} =2000V	
Package	TO-3P(H)IS		TO-3P(LH)	TO-3P(H)IS		TO-3P(LH)	TO-3P(H)IS	TO-3P(LH)
P _C max	40-75W		180-220W	40-75W		180-220W	40-75W	180-220W
*I _{C(sat)}	with Dumper	without Dumper	without Dumper	with Dumper	without Dumper	without Dumper	without Dumper	without Dumper
3 A	2SD2599			2SD2550				
3.5 A	2SD2586							
4 A	2SD2499	2SD2498		2SD2551				
4.5 A	S2055N	S2000N						
5 A	2SD2539							
	2SC5339							
5.5 A				2SD2638				
6 A	2SC5280	2SC5386		2SC5716				
	2SD2559	2SD2500		2SD2553				
7 A		2SC5404						
8 A		2SC5387						
		2SC5855						
11 A		2SC5411	2SC5421			2SC5422	2SC5997	
		2SC5856						
12 A					2SC6041	2SC5590		2SC5748
					2SC5588			
14 A		2SC5587	2SC5589			2SC5446		
15 A			2SC5445					
17 A		2SC5717	2SC5695		2SC5857	2SC5858		2SC5612
18 A						2SC5859		
22 A						2SC5570		

Note

2SD... & S2...	: Third generation	
2SC... & 2SD...	: Fourth generation	* I _{C(sat)} = I _C at V _{ce} =V _{ce(sat)}
2SC...	: Fifth generation	

Line up (2SC series)

Part Number	MP	Max. Rating			Dumper Diode	h _{FE}			V _{CE(sat)} Max.			Switching time (Typ.)			
		V _{CB0} (V)	I _C (A)	P _C (W)		Min. (-)	Max. (-)	@5V/I _C (A)	(V)	@ I _C (A)	@ I _B (A)	t _{stg} (us)	t _f (us)	@ f _H (kHz)	@ I _{CP} (A)
2SC5339	OK	1500	7	50	○	4.0	8.0	5	5	5	1.25	4.0	0.20	32	5.0
2SC5280	OK	1500	8	50	○	4.0	8.5	6	5	6	1.5	4.0	0.20	32	6.0
2SC5386	OK	1500	8	50	x	4.3	7.5	6	3	6	1.5	2.5	0.15	64	5.0
2SC5404	OK	1500	9	50	x	4.0	8.0	7	3	7	1.75	2.5	0.15	64	5.5
2SC5387	OK	1500	10	50	x	4.3	7.8	8	3	8	2	2.5	0.15	64	6.0
2SC5411	OK	1500	14	60	x	4.0	8.0	11	3	11	2.75	2.5	0.15	64	8.5
2SC5421	OK	1500	15	180	x	4.0	8.0	11	3	11	2.75	2.5	0.15	64	8.5
2SC5587	OK	1500	17	75	x	5.0	8.0	14	3	14	3.5	1.8	0.10	100	7.5
2SC5589	OK	1500	18	200	x	5.0	8.0	14	3	14	3.5	1.8	0.10	100	7.5
2SC5445	OK	1500	20	200	x	4.5	8.5	15	3	15	3.75	2.0	0.10	100	8.0
2SC5716	OK	1700	8	55	○	3.8	9.0	6	5	6	1.5	3.5	0.20	32	5.5
2SC5588	OK	1700	15	75	x	4.8	8.0	12	3	12	3	1.8	0.10	100	6.5
2SC5422	OK	1700	15	200	x	4.5	8.5	11	3	11	2.75	2.5	0.15	64	8.0
2SC5590	OK	1700	16	200	x	4.8	8.0	12	3	12	3	1.8	0.10	100	6.5
2SC5446	OK	1700	18	200	x	4.0	8.0	14	3	14	3.5	2.1	0.10	100	7.0
2SC5570	OK	1700	28	220	x	4.5	7.5	22	3	22	5.5	1.4	0.10	130	8.0
2SC5612	OK	2000	22	220	x	4.8	9.0	17	3	17	4.25	4.0	0.15	32	8.0
NEW ! 2SC5855	OK	1500	10	50	x	4.3	6.7	8	3	8	2	2.3	0.10	80	5.5
NEW ! 2SC5856	OK	1500	14	55	x	4.5	7.8	11	3	11	2.75	1.8	0.10	100	6.5
2SC5717	OK	1500	21	75	x	4.5	8.5	17	3	17	3.75	1.6	0.10	100	8.0
2SC5695	OK	1500	22	200	x	4.5	8.5	17	3	17	3.75	1.6	0.10	100	8.0
NEW ! 2SC6041	OK	1700	15	70	x	5.0	7.5	12	1.5	12	3	3.5	0.10	45	7.0
NEW ! 2SC5857	OK	1700	21	75	x	5.0	7.5	17	1.5	17	4.25	3.5	0.10	45	8.0
NEW ! 2SC5858	OK	1700	22	200	x	5.0	7.5	17	1.5	17	4.25	3.5	0.10	45	8.0
2SC5859	OK	1700	23	210	x	4.5	8.0	18	3	18	4.5	1.8	0.10	100	7.5
NEW ! 2SC5997	OK	2000	14	75	x	5.0	7.2	11	1.5	11	2.75	5.0	0.12	32	6.0
2SC5748	OK	2000	16	210	x	4.8	7.5	12	3	12	3	4.0	0.15	32	8.0

Note

2SC... & 2SD...

: Fourth generation

2SC...

: Fifth generation

Line up (2SD / S series)

Part Number	MP	Max. Rating			with Dumper	h_{FE}			$V_{CE(sat)}$ Max.			Switching time			
		V_{CBO} (V)	I_C (A)	P_C (W)		Min. (-)	Max. (-)	@5V/ I_C (A)	(V)	@ I_C (A)	@ I_B (A)	t_{stg} (us)	t_f (us)	@ f_H (kHz)	@ I_{CP} (A)
2SD2498	OK	1500	6	50		5	9	4	5	4	0.8	10	0.7	15.75	4
2SD2499	OK	1500	6	50	○	5	9	4	5	4	0.8	11	0.6	15.75	4
2SD2539	OK	1500	7	50	○	5	9	5	5	5	1	9	0.6	15.75	5
2SD2500	OK	1500	10	50		4	8	6	3	6	1.5	11	0.7	15.75	6
2SD2550	OK	1700	4	50	○	8	22	1	8	3	0.8	10	0.6	15.75	3
2SD2551	OK	1700	5	50	○	5	10	4	5	4	0.8	10	1.0	15.75	4
2SD2553	OK	1700	8	50	○	5	9	6	5	6	1.2	12	0.7	15.75	6
2SD2599	OK	1500	3.5	40	○	8	25	0.5	8	3	0.8	10	1.0	15.75	3
2SD2586	OK	1500	5	50	○	4.4	8.5	3.5	5	3.5	0.8	10	0.6	15.75	3.5
2SD2559	OK	1500	8	50	○	5	9	6	5	6	1.2	12	1.0	15.75	6
2SD2638	OK	1700	7	50	○	4.5	7.5	5.5	5	5.5	1.2	9	0.8	15.75	5.5
S2000N	OK	1500	8	50		4.5	9	4.5	5	4.5	1	12	0.7	15.75	4.5
S2055N	OK	1500	8	50	○	4.5	9	4.5	5	4.5	1	11	0.6	15.75	4.5

2SD... & S2... : Third generation

2SD... : Fourth generation

TR selection guide(for TV)

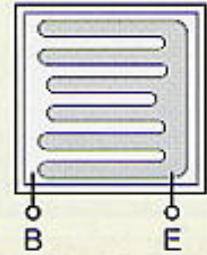
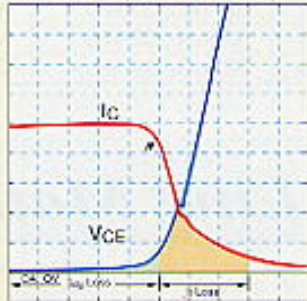
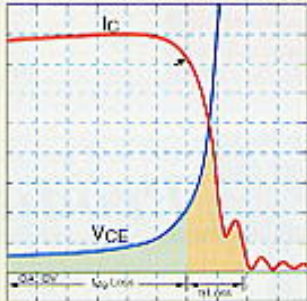
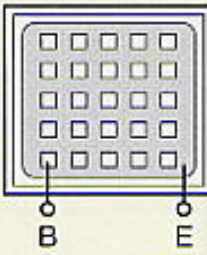
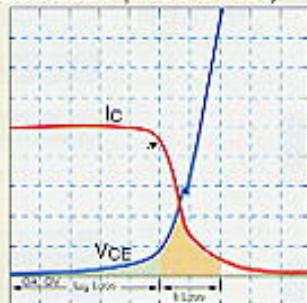
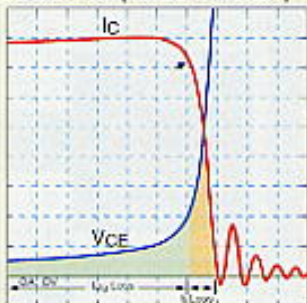
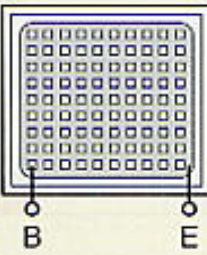

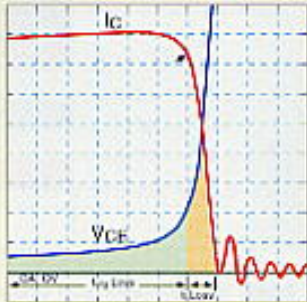
For reference

Display size	$V_{CBO}=1500V$		$V_{CBO}=1700V$		$V_{CBO}=2000V$
	with dumper diode	without dumper diode	with dumper diode	without dumper diode	without dumper diode
Flat TV / Wide TV / Projector : D1 terminal (525i / fH=15.75kHz)					
9 to 16 inch	2SD2599		2SD2550		
16 to 20 inch	2SD2586		2SD2550		
20 to 24 inch	2SD2499 or S2055N	2SD2498 or S2000N	2SD2551		
24 to 28 inch	2SD2539 or 2SC5339	2SD2500	2SD2638 or 2SD2553		
28 to 32 inch	2SD2559 or 2SC5280	2SC5386 or 2SC5404	2SD2553 or 2SC5716 or 2SD2638		2SC5997
32 to 36 inch		2SC5855		2SC6041	2SC5997
more than 36 inch		2SC5856		2SC6041	
Progressive, High Vision / TV , Projector : D2 terminal (525p / fH= 31.5kHz) , D3 terminal (1125i / fH=33.75kHz)					
24 to 28 inch		2SC5855	2SC5716	2SC6041	2SC5997
28 to 32 inch		2SC5856 or 2SC5587	2SC5716	2SC6041	2SC5997
32 to 36 inch		2SC5856 or 2SC5587		2SC5857 or 2SC6041	2SC5748
more than 36 inch		2SC5589 or 2SC5717 or 2SC5695		2SC5858 or 2SC5859	2SC5748 or 2SC5612
High vision / Digital TV : D3 terminal (1125i / fH=33.75kHz , D4 terminal (750p / fH = 45kHz)					
28 to 32 inch	2SC5280(HFE)×2 series	2SC5856×2 series		2SC6041×2series	2SC5748 or 2SC5997
32 to 36 inch		2SC5587×2 series		2SC5857×2series or 2SC6041×2series	2SC5748 or 2SC5612
more than 36 inch		2SC5717×2series		2SC5858×2series or 2SC5857×2 series	2SC5612

NOTE 1 ; How to calculate display size ; Size (inch)=lcp×(4.5 to 5.5) @D1 terminal

Size (inch)=lcp×(3.5 to 4.0) @D2, D3 terminal

Switching wave form & Chip pattern & : 3 G to 5G

<p>Third Generation</p> <p>Priority design for high breakdown level</p> <p>Standard for TV use</p>	<p>Comb pattern</p> 	<p>2SD2553 (1700 V / 8A)</p> 	<p>2SC5142 (1500 V / 20A)</p> 
<p>Fourth Generation</p> <p>Improved switching & Vce(sat) by mesh pattern</p> <p>Low power loss by Vce(sat) from 5v to 3V (Max.)</p>	<p>Mesh pattern</p> 	<p>2SD2638 (1700 V / 7A)</p> 	<p>2SC5445 (1500 V / 20A)</p> 
<p>Fifth Generation</p> <p>High voltage(1700V, 200V) & high current available , keeping 4th G. characteristics</p> <p>Vce(sat)=1.5V TR developed for TV and lower power loss type possible</p>	<p>Super mesh pattern</p> 		<p>2SC5695 (1500 V / 22A)</p> 

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