

# 1 Transistors

Applications	Type No		Electrical Characteristics (Ta = 25°C)														Package					
			Maximum Ratings				V <sub>CE(sat)</sub> MAX				f <sub>T</sub> (TYP) MIN				NF (TYP) MAX							
	NPN	PNP	V <sub>CEO</sub> (V)	I <sub>C</sub> (mA)	P <sub>C</sub> (mW)	h <sub>FE</sub>	V <sub>CE</sub> (V)	I <sub>C</sub> (mA)	I <sub>B</sub> (mA)	f <sub>T</sub> (MHz)	V <sub>CE</sub> (V)	I <sub>C</sub> (mA)	V <sub>CE</sub> (V)	I <sub>C</sub> (mA)	NF (dB)	V <sub>CE</sub> (V)	I <sub>C</sub> (mA)	f (kHz)	R <sub>g</sub> (KΩ)	Fig		
	2SC387SS	2SA1504S	50	150	150	70~700	6	2	0.25	100	10	80	10	1	10	6	0.1	1	10	SOT-23	F1	
	2SC3201	2SA1269	120	100	200	200~700	6	2	0.3	10	1	(100)	6	1	10	6	0.1	1	10	TO-92M	F5	
	2SC3199	2SA1267	50	150	200	70~700	6	2	0.25	100	10	80	10	1	10	6	0.1	1	10	TO-92M	F5	
	2SC3198A	—	40	150	300	70~700	6	2	0.2	100	3	(250)	10	10	10	6	0.1	1	10	TO-92(C)	F3	
	2SC3198	2SA1266	50	150	400	70~700	6	2	0.25	100	10	80	10	*-1	10	6	0.1	1	10	TO-92(C)	F3	
	KTC100	—	25	50	250	70~700	6	2	0.5	10	1	50	6	*-1	-	-	-	-	-	TO-92(C)	F3	
	KTC9014	KTC9015	50	150	625	60~1000	5	1	0.25	100	10	60	10	*-1	10	6	0.1	1	10	TO-92(B)	F3	
General Purpose	BCW31	BCW29	20	100	200	110~220	5	2	0.25	10	0.5	(300)	5	10	10	5	0.2	1	2	SOT-23	F1	
	BCW32	BCW30	20	100	200	200~450	5	2	0.25	10	0.5	(300)	5	10	10	5	0.2	1	2	SOT-23	F1	
	BCW33	—	20	100	200	420~800	5	2	0.25	10	0.5	(300)	5	10	10	5	0.2	1	2	SOT-23	F1	
	BCW71	BCW69	45	100	200	110~220	5	2	0.25	10	0.5	(300)	5	10	10	5	0.2	1	2	SOT-23	F1	
	BCW72	BCW70	45	100	200	200~450	5	2	0.25	10	0.5	(300)	5	10	10	5	0.2	1	2	SOT-23	F1	
	BCW81	—	45	100	200	420~800	5	2	0.25	10	0.5	(300)	5	10	10	5	0.2	1	2	SOT-23	F1	
	BCV71	BCW89	60	100	200	110~220	5	2	0.25	10	0.5	(300)	5	10	10	5	0.2	1	2	SOT-23	F1	
	BCV72	—	60	100	200	200~450	5	2	0.25	10	0.5	(300)	5	10	10	5	0.2	1	2	SOT-23	F1	
	BSS64	—	80	100	200	80(TYP)	1	10	0.15	4	0.4	60	10	4	-	-	-	-	-	-	SOT-23	F1
	—	BSS63	—	100	100	200	30(MIN)	1	10	0.25	25	2.5	50	5	25	-	-	-	-	-	SOT-23	F1
	BCX20	—	25	100	310	100~600	1	100	0.62	500	50	(200)	5	10	-	-	-	-	-	-	SOT-23	F1
	BC238	BC308	20	100	300	120~800	5	2	0.6	100	5	50	5	10	10	6	0.1	1	10	TO-92(B)	F3	
	BC168	BC258	20	100	300	120~800	5	2	0.6	100	5	150	5	10	10	6	0.1	1	10	TO-92(C)	F3	
	BC167	BC257	45	100	300	120~460	5	2	0.6	100	5	150	5	10	10	6	0.1	1	10	TO-92(C)	F3	
	BC237	BC307	45	100	300	120~460	5	2	0.6	100	5	150	5	10	10	6	0.1	1	10	TC-92(B)	F3	
	Low Noise Amp	2SC3277S	2SA1506S	120	400	150	200~700	6	2	0.3	10	1	(100)	6	1	3	6	0.1	1	10	SOT-23	F1
2SC3199L		2SA1267L	50	150	200	70~700	6	2	0.25	100	10	80	10	1	3	6	0.1	1	10	TO-92M	F5	
2SC3200		2SA1268	120	100	300	200~700	6	2	0.3	10	1	(100)	6	1	2	6	0.1	1	10	TO-92(C)	F3	

\*:I<sub>B</sub>

Applications	Type No		Electrical Characteristics (Ta = 25°C)										Package								
			Maximum Ratings					Electrical Characteristics (Ta = 25°C)													
			V <sub>CEO</sub> (V)	I <sub>C</sub> (mA)	P <sub>C</sub> (mW)	h <sub>FE</sub>	(MIN)	V <sub>CE(sat)</sub> (V)	I <sub>C</sub> (mA)	I <sub>B</sub> (mA)	f <sub>T</sub> (MHz)	(TYP) MIN			(TYP) MAX	NF (dB)	V <sub>CE</sub> (V)	I <sub>C</sub> (mA)	f (kHz)	R <sub>g</sub> (KΩ)	
	NPN	PNP	50	150	400	70~700	6	2	0.3	10	1	80	6	*-1	3	6	0.1	1	10	TO-92(C)	F3
Low Noise Amp			20	100	200	120~260	5	2	0.3	10	0.5	(150)	5	10	4	5	0.2	1	2	SOT-23	F1
	BCF32	BCF30	20	100	200	(160)	5	10μA	0.25	10	5	(300)	5	5	4	5	0.2	1	2	SOT-23	F1
	BCF33	—	20	100	200	(250)	5	10μA	0.25	10	5	(300)	5	5	4	5	0.2	1MHz	2	SOT-23	F1
	—	BCF70	45	100	200	200~460	5	2	0.3	10	0.5	(150)	5	10	4	5	0.2	1	2	SOT-23	F1
	BCF81	—	45	100	200	(250)	5	10μA	0.25	10	5	(300)	5	5	4	5	0.2	1MHz	2	SOT-23	F1
	BC169	BC259	20	50	300	180~800	5	2	0.2	10	0.5	150	5	10	3	6	0.1	1	10	TO-92(C)	F3
	BC239	BC309	20	50	300	180~800	5	2	0.2	10	0.5	150	5	10	3	6	0.1	1	10	TO-92(B)	F3
	BC549	BC559	30	100	625	110~800	5	2	0.6	100	5	(300)	5	10	4	5	0.2	1	10	TO-92(B)	F3
	BC550	BC560	45	100	625	110~800	5	2	0.6	100	5	(300)	5	10	-	-	-	-	-	TO-92(B)	F3

Applications	Type No		Electrical Characteristics (Ta = 25°C)										Package							
			Maximum Ratings					Electrical Characteristics (Ta = 25°C)												
			V <sub>CEO</sub> (V)	I <sub>C</sub> (A)	P <sub>C</sub> (W)	h <sub>FE</sub>	(MIN)	V <sub>CE(sat)</sub> (V)	I <sub>C</sub> (mA)	I <sub>B</sub> (mA)	f <sub>T</sub> (MHz)	(TYP)			(TYP) MAX	C <sub>ob</sub> (pF)	V <sub>CB</sub> (V)	f (MHz)		
	NPN	PNP	30	0.5	0.15	70~240	1	100	0.25	100	10	300	6	20	(7)	6	1	1	SOT-23	F1
AF Drive and Output	2SC3204	2SA1272	30	0.8	0.3	100~320	1	100	0.5	500	20	120	5	10	(13)	10	1	1	TO-92M	F5
	2SC3202	2SA1270	30	0.5	0.5	70~240	1	100	0.25	100	10	300	6	*-20	(7)	6	1	1	TO-92(C)	F3
	2SC4372	2SA1660	150	0.05	*0.8	70~240	5	10	0.5	10	1	120	30	10	5	10	1	1	SOT-89	F2
	2SC4374	2SA1662	80	0.4	*1	70~240	2	50	0.4	200	20	100	10	10	(10)	10	1	1	SOT-89	F2
	2SC4376	2SA1664	30	0.8	*1	100~320	1	100	0.5	500	20	120	5	10	(13)	10	1	1	SOT-89	F2
	2SC4373	2SA1661	120	0.8	*1	80~240	5	100	1.0	500	50	120	5	100	30	10	1	1	SOT-89	F2
	2SC4375	2SA1663	30	1.5	*1	100~320	2	500	2.0	1.5A	30	120	2	500	40	10	1	1	SOT-89	F2
	2SC3227	2SA1274	80	0.4	0.8	70~240	2	50	0.4	200	20	100	10	10	(10)	10	1	1	TO-92L	F4
	2SC4370	2SA1659	160	1.5	*20	70~240	5	100	1.5	500	50	100	10	100	(25)	10	1	1	TO-220(S)	F7

P<sub>C</sub>\* T<sub>C</sub> = 25°C Pc\* mounted on ceramic substrate (250mm<sup>2</sup> × 0.8t) \*I<sub>B</sub>

Applications	Type No		Maximum Ratings										Electrical Characteristics (Ta = 25°C)										Package	
			NPN	PNP	V <sub>CE</sub> (V)	I <sub>C</sub> (A)	P <sub>C</sub> (W)	h <sub>FE</sub>	V <sub>CE(sat)</sub>		MAX		f <sub>T</sub> (MHz)	(TYP) MIN		C <sub>ob</sub> (pF)	(TYP) MAX		Fig					
	V <sub>CE</sub> (V)	I <sub>C</sub> (mA)							I <sub>C</sub> (mA)	I <sub>B</sub> (mA)	V <sub>CE</sub> (V)	I <sub>C</sub> (mA)		V <sub>CE</sub> (V)	I <sub>C</sub> (mA)									
AF Drive and Output	2SC4370A	2SA1659A	180	1.5	≥20	70~240	5	100	1.5	500	50	100	10	100	(25)	10	1	TO-220IS	F7					
	2SD2060	2SB1368	80	4	≥25	40~240	5	0.5A	1.5	3A	0.3A	5	0.5A	(90)	10	1	TO-220IS	F7						
	2SD2059	2SB1367	100	5	≥30	40~240	5	1A	2.0	4A	0.4A	5	1A	(100)	10	1	TO-220IS	F7						
	2SD1352	2SB989	80	4	≥30	40~240	5	0.5A	1.5	3A	0.3A	5	0.5A	(90)	10	1	TO-220AB	F6						
	KTC200	KTA200	50	0.5	0.6	70~240	2	50	0.25	100	10	300	6	*-20	(7)	6	1	TO-92(C)	F3					
	KTC2235	KTA965	120	0.8	0.9	80~240	5	100	1.0	500	50	120	5	100	30	10	1	TO-92L	F4					
	KTC2238	KTA968	160	1.5	≥25	70~240	5	100	1.5	500	50	100	10	100	(25)	10	1	TO-220AB	F6					
	KTC2238A	KTA968A	180	1.5	≥25	70~240	5	100	1.5	500	50	100	10	100	(25)	10	1	TO-220AB	F6					
	KTD525	KTB595	100	5	≥40	40~240	5	1A	2.0	4A	0.4A	12	5	1A	(100)	10	1	TO-220AB	F6					
	KTD718	KTB688	120	8	≥80	55~160	5	1A	2.5	5A	0.5A	12	5	1A	(170)	10	1	TO-3P(I)	F9					
	KTC9013	KTC9012	30	0.5	0.625	64~246	1	50	0.25	100	20	140	6	*-20	(7)	6	1	TO-92(B)	F3					
	KN4400	KN4402	40	0.6	0.31	50~150	1	50	0.25	500	50	200	10	*-20	(7)	10	1	TO-92(B)	F3					
	KN4401	KN4403	40	0.6	0.31	100~300	1	150	0.75	500	50	200	10	*-20	(7)	10	1	TO-92(B)	F3					
	BCX19	—	45	0.5	0.31	100~600	1	100	0.62	500	50	200	5	10	(6)	10	1	SOT-23	F1					
—	BCW67	32	0.8	0.36	100~630	1	100	0.3	100	10	100	10	80	18	10	1	SOT-23	F1						
—	BCW68	45	0.8	0.36	100~630	1	100	0.7	500	50	100	10	80	18	10	1	SOT-23	F1						
BC183	BC213	30	0.2	0.3	120~800	5	2	0.6	100	5	150	5	10	5	10	1	TO-92	F3						
BC184	BC214	30	0.2	0.3	250~800	5	2	0.25	10	0.5	150	5	10	5	10	1	TO-92	F3						
BC182	BC212	50	0.2	0.3	120~460	5	2	0.6	100	5	200	5	10	5	10	1	TO-92	F3						
BC548	BC558	30	0.1	0.5	75~800	5	2	0.6	100	5	150	5	10	4.5	10	1	TO-92(B)	F3						
BC547	BC557	45	0.1	0.5	75~450	5	2	0.6	100	5	150	5	10	4.5	10	1	TO-92(B)	F3						
BC546	BC556	65	0.1	0.5	75~450	5	2	0.6	100	5	150	5	10	4.5	10	1	TO-92(B)	F3						
BC338	BC328	25	0.8	0.625	100~400	1	100	0.7	500	50	100	5	10	(12)	10	1	TO-92(B)	F3						
BC337	BC327	45	0.8	0.625	100~400	1	100	0.7	500	50	100	5	10	(12)	10	1	TO-92(B)	F3						

\*:If

Pc\*:Tc=25°C