

Applications	Type No		Maximum Ratings			Electrical Characteristics (Ta = 25°C)														Package																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
			V _{CEO} (V)	I _C (mA)	P _C (mW)	h _{FE}	(MIN)		V _{CE(sat)} (V)	MAX		f _T (MHz)	(TYP) MIN		NF (dB)	MAX																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	V _{CE} (V)	I _C (mA)					I _C (mA)	I _B (mA)		V _{CE} (V)	I _C (mA)		I _E (mA)	f (MHz)		R _g (Ω)	Fig																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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*: I_E *: C_{PE} *: V_{CC}

Applications	Type No		Maximum Ratings				Electrical Characteristics (Ta = 25°C)														Package																				
			NPN				PNP				MAX				MIN				MAX																						
	V _{CE} (V)		I _C (mA)		P _C (mW)		h _{FE}		(MIN)		V _{CE} (sat)(V)		I _C (mA)		f _r (MHz)		V _{CE} (V)		I _C (mA)		G _{Pe} (dB)		V _{CC} (V)		I _C (mA)		f(MHz)		Fig												
VIII RI	—		KTC2348		—		30		20		250		20~200		10		2		—		—		400		10		2		20~28		10		0		TO-92(C)		F3				
	—		2SC3882S		—		15		50		150		40~200		3		8		—		—		650		10		8		*1.3		*10		—		1		SOT-23		F1		
	—		KTC2349		—		15		50		250		(20)		3		8		—		—		600		10		8		*1.5		*10		—		1		TO-92(C)		F3		
VIII OSC	—		BFQ31		—		15		100		200		(20)		1		3		0.4		10		1		600		10		4		*1.7		*10		—		1		SOT-23		F1
	—		KTC2347		—		15		50		250		(20)		3		8		—		—		650		10		8		*1.5		*10		—		1		TO-92(C)		F3		
	—		KTC3120S		—		15		50		150		40~200		10		5		—		—		1,500		10		2		*0.9		10		—		800		SO1-23		F1		
VIII OSC	—		KTC3121S		—		15		50		150		60~320		3		8		—		—		1,100		10		8		*1.3		*10		—		1		SOT-23		F1		

*Cob, *Cre, *V_{CE}

I/V PH	2SC3881S		—		—		25		50		150		20~200		10		10		1.5		250		10		*1.6		—		1		SOT-23		F1
	2SC3196		—		—		40		50		250		(30)		10		4		—		400		10		32~40		4		1		TO-92(C)		F3
	2SC3197		—		—		25		50		300		20~200		12.5		12.5		1.5		300		12.5		28~36		12.5		45		TO-92(C)		F3

Applications	Type No		Electrical Characteristics (Ta = 25°C)														Package		
			Maximum Ratings				Electrical Characteristics (Ta = 25°C)												
	NPN		PNP		V _{CE0} (V)	I _C (A)	P _C (W)	h _{FE}	V _{CE(sat)}		MAX		f _T (MHz)	TYP		C _{ob} (PF)	TYP		
	V _{CE} (V)	I _C (mA)	V _{CE} (V)	I _C (mA)					I _B (mA)	V _{CE} (V)	I _C (mA)	V _{CB} (V)		f (MHz)	Fig				
I/V Vertical Output	2SC3205	2SA1273	30	2	1	100~320	2	500	2.0	1.5A	30	120	2	500	30	10	1	TO-92L	F4
	2SC4369	2SA1658	30	3	1.5	40~400	2	500	0.8	2A	0.2A	100	2	500	35	10	1	TO-220IS	F7
	2SC4368	2SA1657	150	1.5	20	40~140	10	500	1.5	500	50	4	10	500	35	10	1	TO-220IS	F7
	2SD2058A	—	60	3	25	60~300	5	500	1.0	3A	0.3A	3.0	5	500	70	10	1	TO-220IS	F7
	—	2SB1366	60	3	25	60~300	5	500	1.0	3A	0.3A	9	5	500	150	10	1	TO-220IS	F7
	2SC3230	2SA1276	30	3	10	70~240	2	500	0.8	2A	0.2A	100	2	500	35	10	1	TO-220AB	F6
	2SD1351A	—	60	3	25	60~300	5	500	1.0	3A	0.3A	3.0	5	500	70	10	1	TO-220AB	F6
	—	2SB988	60	3	30	60~200	5	500	1.0	3A	0.3A	9	5	500	150	10	1	TO-220AB	F6
	KTC2073	KTA940	150	1.5	25	40~140	10	500	1.5	500	50	4	10	500	35	10	1	TO-220AB	F6

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						V _{CE(sat)}		MAX		f _T (MHz)	(TYP)		MIN	Cob (pF)	(TYP) MAX																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	NPN	PNP	V _{CE0} (V)	I _C (A)	P _C (W)	h _{FE}	(MIN)		I _C (mA)		I _B (mA)	V _{CE} (V)			I _C (mA)	V _{CE} (V)	I _C (mA)	f (MHz)	Fig																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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Video Output	2SC3206	KTA949	150	0.05	0.8	70~240	5	10	10	0.5	1.0	10	10	1	(120)	30	10	30	10	5	10	1	1	1	F4
	2SC3207	—	300	0.1	0.9	(20)	10	4	10	1.0	1.0	10	10	1	50	10	20	10	20	(3.0)	20	1	1	1	F4
	2SC3229	—	300	0.05	1.5	(20)	10	0.5	10	1.0	1.0	10	10	1	75	20	20	20	20	4.0	20	1	1	1	F8
	2SC3208	—	300	0.15	*12.5	40~170	10	50	100	1.0	1.0	100	100	20	40	10	30	30	30	6.5	50	1	1	1	F6
	KTC15691	—	300	0.15	*12.5	40~170	10	50	100	1.0	1.0	100	100	20	100	10	30	30	30	5.0	50	1	1	1	F7
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

TV Sound Output	2SC3203	2SA1271	30	0.8	0.6	100~320	1	100	500	0.5	1.0	500	500	20	(120)	5	10	10	10	(13)	10	1	1	1	F3
	2SC3228	2SA1275	160	1	0.9	60~320	5	200	500	1.5	1.5	500	500	50	20	5	200	10	20	20	10	1	1	1	F4
	2SC3205	2SA1273	30	2	1	100~320	2	500	1.5A	2.0	2.0	1.5A	30	30	(120)	2	500	10	30	(30)	10	1	1	1	F4
	2SC4369	2SA1658	30	3	*15	40~400	2	500	2A	0.8	0.8	2A	0.2A	0.2A	(100)	2	500	10	35	(35)	10	1	1	1	F7
	2SD2058A	—	60	3	*25	60~300	5	500	3A	1.0	1.0	3A	0.3A	0.3A	(3.0)	5	500	10	70	(70)	10	1	1	1	F7
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2SB1366	2SB1366	60	3	*25	60~300	5	500	3A	1.0	1.0	3A	0.3A	0.3A	(9)	5	500	10	150	(150)	10	1	1	1	F7
	2SC3230	2SA1276	30	3	*10	70~240	2	500	2A	0.8	0.8	2A	0.2A	0.2A	(100)	2	500	10	35	(35)	10	1	1	1	F6
	2SD1351A	—	60	3	*25	60~300	5	500	3A	1.0	1.0	3A	0.3A	0.3A	(3.0)	5	500	10	70	(70)	10	1	1	1	F6
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2SB988	2SB988	60	3	*30	60~200	5	500	3A	1.0	1.0	3A	0.3A	0.3A	(9)	5	500	10	150	(150)	10	1	1	1	F6
	KTC2230	—	160	0.1	0.8	120~400	10	10	50	0.5	0.5	50	50	5	50	10	10	10	7.0	7.0	10	1	1	1	F4
	KTC2230A	—	180	0.1	0.8	120~400	10	10	50	0.5	0.5	50	50	5	50	10	10	10	7.0	7.0	10	1	1	1	F4
	KTC2231	—	160	0.2	*12	100~320	10	50	200	1.0	1.0	200	20	20	50	10	50	10	10	10	10	1	1	1	F8
	KTC2231A	—	180	0.2	*12	100~320	10	50	200	1.0	1.0	200	20	20	50	10	50	10	10	10	10	1	1	1	F8
	KTC2483	—	160	1.5	*15	100~320	5	200	500	1.0	1.0	500	50	50	40	5	200	10	20	20	10	1	1	1	F8

P_C*, T_C = 25°C

Applications	Type No		Maximum Ratings $T_c = 25^{\circ}\text{C}$					Electrical Characteristics ($T_a = 25^{\circ}\text{C}$)												Package	
			V_{CE0} (V)	I_C (A)	P_C (W)	h_{FE}	(MIN)		$V_{CE(sat)}$		MAX		$V_{BE(sat)}$ (V)	MAX		SW		time (TYP) MAX			
	V_{CE} (V)	I_C (A)					I_C (A)	I_B (A)	I_C (A)	I_B (A)	t_{on} (μs)	t_{sg} (μs)		t_f (μs)							
Switching Regulator	NPN	PNP																			Fig
	2SC4371	—	400	5	30	(12)	5	3	1.0	5	1	1.5	5	1	*1.0	2.5	1.0	TO-220IS		F7	
	KTD1947	—	100	10	30	(500)	1	1	0.3	5	0.05	1.2	5	0.05	(0.5)	(5.0)	(1.0)	TO-220IS		F7	
	KTC3148	—	800	3	40	(10)	5	0.8	0.6	0.8	0.16	1.2	0.8	0.16	*1.0	4.0	1.0	TO-220AB		F6	
	KTC2553	—	400	5	40	(12)	5	3	1.0	5	1	1.5	5	1	*1.0	2.5	1.0	TO-220AB		F6	
	KTC2200	—	400	7	40	(10)	5	3	1.5	3	0.3	2.0	3	0.3	*1.0	2.0	1.0	TO-3P(S)		F11	
	KTC2791	—	800	5	100	(10)	5	10mA	1.0	3	0.6	1.5	3	0.6	*1.0	3.5	1.0	TO-3P(L)		F12	
	KTC2650	—	400	10	100	(10)	5	5	1.5	5	0.5	2.0	5	0.5	*1.0	2.5	1.0	TO-3P(L)		F12	
	KTC3680	—	800	7	120	(10)	5	10mA	1.0	3	0.6	1.5	3	0.6	*1.0	3.5	1.0	TO-3P(L)		F12	
	BUV48A	—	450	15	(150)	—	—	—	1.5	8	1.6	1.6	8	1.6	1	3	0.8	TO-3P(L)		F12	
	BUV48C	—	700	15	(175)	—	—	—	1.5	6	1.5	1.5	6	1.5	1	3	0.7	TO-3P(L)		F12	
	KTD686	—	80	4	30	(2000)	2	1	1.5	3	6mA	2	3	6mA	0.2	1.5	0.6	TO-220AB		F6	
Darlington	BU806	—	200	8	(60)	—	—	—	1.5	5	0.05	2.8	5	0.5	0.35	0.55	0.2	TO-220AB		F6	

* t_f

Applications	Type No		Maximum Ratings			Electrical Characteristics (Ta = 25°C)																
			VCE0 (V)	IC (mA)	PD (mW)	hFE	(MIN)		VCE(sat) (V)	MAX		fT (MHz)	VCE (V)	IC (mA)	SW Time					MAX		Package
	VCE (V)	IC (mA)					IC (mA)	IB (mA)		tON (ns)	tD (ns)				tF (ns)	tSG (ns)	tF (ns)					
Switching	2N3904	2N3906	40	200	625	*100~300	1.0	10	0.2	10	1.0	300	20	10	10	—	35	35	200	50	TO-92(B)	F3
	—	2N5401	150	600	625	* 60~240	5.0	1.0	0.2	10	1.0	100	10	10	10	—	—	—	—	—	TO-92(B)	F3
	2N5551	—	160	600	625	* 80~250	5.0	10	0.2	50	5.0	100	10	10	10	—	—	—	—	—	TO-92(B)	F3
	KTN2369	—	15	500	625	* 40~120	1.0	10	0.25	10	1.0	500	10	10	10	12	—	—	13	—	TO-92(B)	F3
	KTN2369A	—	15	500	625	* 40~120	1.0	10	0.3	10	1.0	500	10	10	10	12	—	—	13	—	TO-92(B)	F3
	KTN2222	KTN2907	30	600	625	(50)	10	1.0	0.4	150	15	250	20	20	20	—	10	25	225	60	TO-92(B)	F3
	KTN2222A	KTN2907A	40	600	625	(50)	10	1.0	0.3	150	15	300	20	20	20	—	10	25	225	60	TO-92(B)	F3
	—	*MPSA92	300	500	625	*(25)	10	1.0	0.5	20	2.0	50	20	10	10	—	—	—	—	—	TO-92(B)	F3
	—	*MPSA93	200	500	625	*(25)	10	1.0	0.4	20	2.0	50	20	10	10	—	—	—	—	—	TO-92(B)	F3

* Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$

Applications	Type No		Maximum Ratings			Electrical Characteristics (Ta = 25°C)												Package	
			V _{CEO} (V)	I _C (A)	P _C (W)	h _{FE}	V _{CE(sat)}		MAX		f _T (MHz)	TYP		C _{ob} (pF)	TYP				
	V _{CE} (V)	I _C (mA)					I _C (mA)	I _B (mA)	V _{CE} (V)	I _C (mA)		V _{CB} (V)	f (MHz)						
	NPN	PNP																Fig	
27MHz Drive/Output	KTC2036A	—	80	1	1.2	100	2	150	0.7	500	20	100	10	150	10	100	12	1	F8
	KTC2075	—	80	4	×10	25	5	0.5A	1.5	3A	0.3A	100	5	100	5	500	40	1	TO-202 TO-220AB F6
High β Low V _{CE(sat)}	KTC3112	—	50	0.15	0.4	600~3600	6	2	0.25	100	10	10	10	250	10	10	3.5	1	TO-92L F3
	KTD1582	—	50	1	1	800~3200	5	0.3A	0.3	0.5A	5	250	10	250	10	(0.5A)	18	1	TO-92L F4
Strobo Flash	2SC3226	—	10	2	0.9	140~600	1	0.5A	0.5	2A	50	150	1	150	1	0.5A	27	1	TO-92L F4
	2SC4377	—	30	2	*1	140~600	1	0.5A	0.5	2A	50	150	1	150	1	0.5A	27	1	SOT-89 F2
	—	KTA1242	20	5	*10	100~320	2	0.5A	1	4A	0.1A	170	2	170	2	0.5A	62	1	SMIP-3 F13
Muting	*KTC2878	—	20	0.3	0.4	200~1200	2	4	0.3	30	3	30	6	30	6	4	4.8	1	TO-92(C) F3

Pc: T_c = 25°C Pc*: mounted on ceramic substrate (250mm²×0.8t)