

Electronic Light Ballast Design-in Guidelines[▲]



Typical Application

P/N	V _{CEO} (V)	V _{CES} V _{CEV} (V)	I _c (A)	P _{tot} (W)	Package	Compact Fluorescent Lamp	Halogen Lamps Transformer	Industrial Lamp Ballast	
								Push pull	Half bridge Voltage feed Current feed
STX93003	-400	-500	-1	1.5	TO-92	up to 13W/18W*			
STBV68	400	600	0.6	0.9	TO-92	up to 7W/9W*			
STBV45	400	600	0.75	0.95	TO-92	up to 9W/12W*			
STBV42	400	700	1	1	TO-92	up to 11W/15W*			
STBV32	400	700	1	1.1	TO-92	up to 13W/18W*			
STX13003	400	700	1	1.5	TO-92	up to 13W/18W*			
STX83003	400	700	1	1.5	TO-92	up to 13W/18W*			
STX13005	400	700	3	2.8	TO-92	up to 15W/20W*			
ST93003	-400	-500	-1.5	40	SOT-32	up to 13W/18W*			
ST13003	400	700	1.5	40	SOT-32	up to 13W/18W*			
ST83003	400	700	1.5	40	SOT-32	up to 13W/18W*			
BULT118	400	700	2	45	SOT-32	up to 20W		up to 20W	
BULK128D-B	400	700	4	55	SOT-82	up to 23W		up to 40W/72W*	
BULD116D-1	200	400	5	20	IPAK	up to 23W [◇]			
STD93003-1	-400	-500	-1.5	20	IPAK	up to 13W/18W*			
STD13003-1	400	700	1.5	20	IPAK	up to 13W/18W*			
STD83003-1	400	700	1.5	20	IPAK	up to 13W/18W*			
BULD118D-1	400	700	2	20	IPAK	up to 17W		up to 20W	
BULD1101ET4	450	1100	3	35	DPAK			up to 2 x 32W [◇]	up to 2 x 32W ^Δ
STB13005-1	400	700	4	75	I ² PAK			up to 40W/72W*	
BULB39DT4	450	850	4	70	D ² PAK		up to 50W		
BULB49DT4	450	850	5	80	D ² PAK		up to 75W		
BUL116D	200	400	5	60	TO-220	up to 23W [◇]			
BUL85D	250	500	8	80	TO-220		up to 100W [◇]		
BUL118	400	700	3	60	TO-220	up to 23W		up to 20W	
BUL128	400	700	4	70	TO-220	up to 23W		up to 40W/72W*	
BUL128D-B	400	700	4	70	TO-220	up to 23W		up to 40W/72W*	
ST13005	400	700	4	75	TO-220	up to 23W		up to 40W/72W*	
ST13007	400	700	8	80	TO-220			up to 120W	
ST13007D	400	700	8	80	TO-220		up to 120W		
BUL57	400	700	8	85	TO-220			up to 120W	
BUL67	400	700	10	100	TO-220		up to 150W		
BUL138	400	800	5	80	TO-220			up to 80W/120W*	up to 120 W [◇]
BUL59	400	850	8	90	TO-220		up to 105W		
BUL89	400	850	12	110	TO-220		up to 250W		
BUL742	400	900	4	70	TO-220			up to 120 W [◇]	up to 120W
BUL903ED*	400	900	5	70	TO-220			up to 130 W [◇]	
BUL742A	400	950	4	70	TO-220			up to 120 W [◇]	up to 120W
BUL38D	450	800	5	80	TO-220		up to 75W		
BUL58D	450	800	8	85	TO-220		up to 105W		
BUL39D	450	850	4	70	TO-220		up to 50W		
BUL49D	450	850	5	80	TO-220		up to 75W		
BUL510	450	1000	10	100	TO-220		up to 150W		
BUL1102E	450	1100	4	70	TO-220			up to 2 x 32W [◇]	up to 2 x 32W ^Δ
BUL1203E	550	1200	5	100	TO-220			up to 140W ^Δ	up to 140W ^Δ
BUL213	600	1300	3	60	TO-220			up to 110W ^Δ	up to 120W ^Δ
BUL1403ED	650	1400	3	80	TO-220			up to 130W ^Δ	
BUL216	800	1600	4	90	TO-220			up to 130W ^Δ	
BUL416	800	1600	6	110	TO-220			up to 200W ^Δ	
BUL810	450	1000	15	125	TO-218		up to 300W		

[▲] 220V mains unless otherwise specified

Suffix D = Integrated free-wheeling diode * Integrated antisaturation and protection network

◇ According to tube impedance ◇ 120V AC mains Δ 277V AC mains

Devices in green to be used in pairs

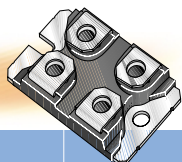
Horizontal Deflection Design-in Guidelines



P/N	V _{CEO} (V)	V _{CBO} (V)	I _C (A)	P _{tot} (W)	Package	Colour Television (screen size)	Monitor (size / type)
BUL310FP	500	1000	5	36	TO-220FP	14"	
BUL312FH	500	1150	5	36	TO-220FH	14"	
BUH315DFH	700	1500	6	40	TO-220FH	up to 21"	
BUH315D	700	1500	6	44	ISOWATT218	up to 21"	
BU808DFH	700	1400	8	42	TO-220FH	up to 21"	
BU808DFI	700	1400	8	52	ISOWATT218	up to 21"	
ST1803DFH	600	1500	10	40	TO-220FH	up to 21"	
ST1803DHI	600	1500	10	50	ISOWATT218	up to 21"	
ST1802FH	600	1500	10	40	TO-220FH	up to 21"	
ST1802HI	600	1500	10	50	ISOWATT218	up to 25"	14" / 48 kHz
ST2001HI	600	1500	10	55	ISOWATT218	up to 29"	15" / 60 kHz
ST2009DHI	600	1500	10	55	ISOWATT218	up to 29"	
ST2310DHI	60	1500	10	55	ISOWATT218	high-end	
ST2310HI	600	1500	10	55	ISOWATT218	high-end	15" / 75 kHz
ST2408HI	600	1500	12	55	ISOWATT218	high-end	17" / 90 kHz
BUH1015HI	700	1500	14	70	ISOWATT218	high-end	17" - 19" / 95 kHz
BUW1015	700	1500	14	70	TO-247	high-end	17" - 19" / 95 kHz
BUW1215	700	1500	16	200	TO-247	high-end	21" / 120 kHz
BUH2M20AP	1200	2000	0.03	40	TO-220	Dynamic Focus	Dynamic Focus

Suffix D, DFI or DHI = Integrated free-wheeling diode

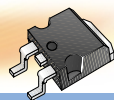
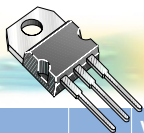
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P/N		V _{CEO}	V _{CBO} V _{CES} V _{CEV}	I _C	P _{tot}	h _{FE} @ I _C		V _{CE}	V _{CE(sat)} @ I _B		Application		
NPN	PNP	(V)	(V)	(A)	(W)	min	max	(A)	(V)	(V)	(mA)		
ESM2012DV		120	150	120	175	1200 #		100	5	1.5 [∅]	70	0.25	Industrial
BUT30V		125	200	100	250	27 #		100	5	1.5	100	10	Industrial
ESM2030DV		300	400	67	150	300 #		56	5	1.8 [∅]	40	0.4	Industrial
BUT32V		300	400	80	250	16 #		40	5	0.9	40	4	Industrial
ESM3030DV		300	400	100	225	300 #		85	5	2.2 [∅]	85	2.4	Industrial
BUT232V		300	400	140	300	17 #		70	5	1.9 [∅]	70	7	Industrial
ESM3045DV		450	600	24	125	120 #		20	5	2 [∅]	20	1.2	Industrial
ESM4045DV		450	600	42	150	220 #		35	5	2	35	2	Industrial
ESM5045DV		450	600	60	175	150 #		50	5	2 [∅]	50	2.8	Industrial
ESM6045DV		450	600	84	250	120 #		70	5	2 [∅]	70	4	Industrial
BUV298V		450	850	60	250	12 #		32	5	2	32	6.4	Industrial
BUV98AV		450	1000	30	150	9 #		24	5	1.5	16	3.2	Industrial
BUV98V		450	1000	30	150	9 #		24	5	1.5	20	4	Industrial
BUV298AV		450	1000	50	250	12 #		32	5	1.2	32	6.4	Industrial
ESM6045AV		450	1000	72	250	150 #		60	5	2 [∅]	60	2.4	Industrial
BUF460AV		450	1000	80	270	15 #		60	5	2	60	12	Industrial

Typical ∅ 100°C

ST preferred products in bold, blue shaded areas indicate Darlington



P/N		V _{CEO}	V _{CB0} V _{CES} V _{CEV}	I _C	P _{tot}	h _{FE} @ I _C V _{CE}				V _{CE(sat)} @ I _C I _B		Application	
NPN	PNP	(V)	(V)	(A)	(W)	min	max	(A)	(V)	(V)	(A)		(mA)
	2N6111	30	40	7	40	30		4	3	1	3	300	Gen. Purp.
BD533	BD534	45	45	8	50	25		2	2	0.8	2	200	Gen. Purp.
	D45H5	45	45	10	50	40		4	1	1	8	400	Gen. Purp.
TIP29A	TIP30A	60	60	1	30	15	75	1	4	0.7	1	125	Gen. Purp.
TIP110	TIP115	60	60	2	50	1000		1	4	2.5	2	8	Gen. Purp.
TIP31A	TIP32A	60	60	3	40	10	50	3	4	1.2	3	375	Gen. Purp.
TIP120	TIP125	60	60	5	65	1000		3	3	2	3	12	Gen. Purp.
TIP41A	TIP42A	60	60	6	65	15	75	3	4	1.5	6	600	Gen. Purp.
BD535	BD536	60	60	8	50	25		2	2	0.8	2	200	Gen. Purp.
	TIP135	60	60	8	70	1000	15000	4	4	2	4	16	Gen. Purp.
	TIP105	60	60	8	80	1000	20000	3	4	2	3	6	Gen. Purp.
D44H8	D45H8	60	60	10	50	40		4	1	1	8	400	Gen. Purp.
BD707	BD708	60	60	12	75	15	150	4	4	1	4	400	Gen. Purp.
BD241A		60	70	3	40	25		1	4	1.2	3	600	Gen. Purp.
MJE3055T	MJE2955T	60	70	10	75	20	70	4	4	1.1	4	400	Gen. Purp.
2N6487	2N6490	60	70	15	75	20	150	5	4	1.3	5	500	Gen. Purp.
	2N6107	70	80	7	40	30		4	2	1	2	200	Gen. Purp.
	MJB32BT4*	80	80	3	40	10	50	3	4	1.2	3	375	Gen. Purp.
	TIP32B	80	80	3	40	10	50	3	4	1.2	3	375	Gen. Purp.
TIP121	TIP126	80	80	5	65	1000		3	3	2	3	12	Gen. Purp.
TIP41B		80	80	6	65	15	75	3	4	1.5	6	600	Gen. Purp.
BD537	BD538	80	80	8	50	15		2	2	0.8	2	200	Gen. Purp.
BDX53B	BDX54B	80	80	8	60	750		3	3	2	3	12	Gen. Purp.
D44H11	D45H11	80	80	10	50	40		4	1	1	8	400	Gen. Purp.
2N6388		80	80	10	65	1000	20000	5	3	2	5	10	Gen. Purp.
	2N6668	80	80	10	65	1000	20000	5	3	2	5	10	Gen. Purp.
BDX33B	BDX34B	80	80	10	70	750		3	3	2.5	3	6	Gen. Purp.
BD709		80	80	12	75	15	150	4	4	1	4	400	Gen. Purp.
	BDW94B	80	80	12	80	750	20000	5	3	2	5	20	Gen. Purp.
BD909	BD910	80	80	15	90	15	150	5	4	1	5	500	Gen. Purp.
BD241B	BD242B	80	90	3	40	25		1	4	1.2	3	600	Gen. Purp.
2N6488	2N6491	80	90	15	75	20	150	5	4	1.3	5	500	Gen. Purp.
BUV26		90	180	14	85					1.5	12	1200	Gen. Purp.
TIP29C	TIP30C	100	100	1	30	15	75	1	4	0.7	1	125	Gen. Purp.
TIP112	TIP117	100	100	2	50	1000		1	4	2.5	2	8	Gen. Purp.
TIP31C	TIP32C	100	100	3	40	10	50	3	4	1.2	3	375	Gen. Purp.
TIP122	TIP127	100	100	5	65	1000		3	3	2	3	12	Gen. Purp.
BD243C	BD244C	100	100	6	65	15		3	4	1.5	6	1000	Gen. Purp.
TIP41C	TIP42C	100	100	6	65	15	75	3	4	1.5	6	600	Gen. Purp.
BDX53C	BDX54C	100	100	8	60	750		3	3	2	3	12	Gen. Purp.
TIP132	TIP137	100	100	8	70	1000	15000	4	4	2	4	16	Gen. Purp.
TIP102	TIP107	100	100	8	80	1000	20000	3	4	2	3	6	Gen. Purp.
BDX33C	BDX34C	100	100	10	70	750		3	3	2.5	3	6	Gen. Purp.
TIP142T	TIP147T	100	100	10	90	1000		5	4	3	10	40	Gen. Purp.
BD711	BD712	100	100	12	75	15	150	4	4	1	4	400	Gen. Purp.
BDW93C	BDW94C	100	100	12	80	750	20000	5	3	2	5	20	Gen. Purp.
BD911	BD912	100	100	15	90	15	150	5	4	1	5	500	Gen. Purp.
BD239C		100	115	2	30	15		1	4	0.7	1	200	Gen. Purp.
BD241C	BD242C	100	115	3	40	25		1	4	1.2	3	600	Gen. Purp.
BUV27		120	240	12	85					1.5	8	800	Switching
BU407		150	330	7	60					1	5	500	Monochr. TVs
BU807		150	330	8	60					1.5	5	500	Monochr. TVs
BDX53F	BDX54F	160	160	8	60	500		2	5	2	2	10	Gen. Purp.
BUL116D		200	400	5	60	8	20	5	5	1.2	5	1000	Lighting/SMPS
BU406		200	400	7	60					1	5	500	Monochr. TVs

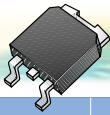
P/N		V _{CEO}	V _{CB0} V _{CES} V _{CEV}	I _C	P _{tot}	h _{FE} @ I _C V _{CE}				V _{CE(sat)} @ I _C I _B			Application	
NPN	PNP	(V)	(V)	(A)	(W)	min	max	(A)	(V)	(V)	(A)	(mA)		
BU806		200	400	8	60					1.5	5	50	Monochr. TVs	
BUV28		200	400	12	85					1.5	6	600	Switching	
TIP47		250	350	1	40	30	150	1	10	1	1	200	Switching	
BUL85D		250	500	8	80	4	10	14	10	1.2	8	1600	Lighting/SMPS	
TIP48		300	400	1	40	30	150	1	10	1	1	200	Switching	
ST9312T		350	350	10	125	300			5	10	1.8	8	100	Electr. Ignition
BU941ZT		350	350	15	150	300			5	10	1.8	10	250	Electr. Ignition
BUB941ZTT4		350	350	15	150	300			5	10	1.8	10	250	Electr. Ignition
TIP49		350	450	1	40	30	150	1	10	1	1	200	Switching	
ST901T		350	500	4	30	1500			2	2	1.3	2	20	Electr. Ignition
	MJE5852	400	450	8	80	15			2	5	2	4	1000	Switching
TIP50		400	500	1	40	30	150	1	10	1	1	200	Switching	
BU931T		400	500	10	125	300			5	10	1.6	7	70	Electr. Ignition
BU810		400	600	7	75	100			2	2	2.5	4	200	Switching
BUL118		400	700	3	60	8			2	5	1.3	2	400	Lighting/SMPS
BUL128		400	700	4	70	14	40		2	5	1.5	2.5	500	Lighting/SMPS
BUL128D-B		400	700	4	70	8	40	2	5	1.5	2.5	500	Lighting/SMPS	
BUL128DBT4*		400	700	4	70	8	40	2	5	1.5	2.5	500	Lighting/SMPS	
ST13005		400	700	4	75	8	40	2	5	1	4	1000	Lighting/SMPS	
STB13005-1**		400	700	4	75	8	40	2	5	1	4	1000	Lighting/SMPS	
MJE13007		400	700	8	80	6			5	5	1.5	5	1000	Switching
ST13007		400	700	8	80	5	30	5	5	2	5	1000	Lighting/SMPS	
ST13007D		400	700	8	80	8	25	5	5	1.5	5	1000	Lighting/SMPS	
BUL57		400	700	8	85	15	40	2	5	1.2	4	800	Lighting/SMPS	
BUL67		400	700	10	100	15	50	1.5	3	1.5	6	1500	Lighting/SMPS	
MJE13009		400	700	12	100	6	30	8	5	1.5	8	1600	Switching	
BUL381D		400	800	5	70	8		2	5	1.1	3	750	Lighting/SMPS	
BUL138		400	800	5	80	8	40	2	5	1	4	1000	Lighting/SMPS	
BUV46		400	850	5	70					1.5	2.5	500	Switching	
MJE13007A		400	850	8	80	6	30	5	5	1.5	5	1000	Switching	
BUL59		400	850	8	90	6	30	5	5	1.5	5	1000	Lighting/SMPS	
BUL89		400	850	12	110	10	40	5	5	1.5	8	1600	Lighting/SMPS	
BUL742		400	900	4	70	10	35	2	5	1.5	4	800	Lighting/SMPS	
BUL903ED		400	900	5	70	20		0.5	3	1.2	2	400	Lighting	
BUL742A		400	950	4	70	16	40	0.8	3	1.5	3.5	1000	Lighting/SMPS	
BUL38D		450	800	5	80	8		2	5	1.1	3	750	Lighting/SMPS	
BUL58D		450	800	8	85	5		5	5	1.5	4	800	Lighting/SMPS	
BUL39D		450	850	4	70	4		5	10	1.1	2.5	500	Lighting/SMPS	
BUL39DT4*		450	850	4	70	4		5	10	1.1	2.5	500	Lighting/SMPS	
BUL49D		450	850	5	80	4	10	7	10	1.2	4	800	Lighting/SMPS	
BUL49DT4*		450	850	5	80	4	10	7	10	1.2	4	800	Lighting/SMPS	
BUT11A		450	1000	5	83					1.5	2.5	500	SMPS	
BUL510		450	1000	10	100	15	45	1	5	1.5	5	1250	Lighting/SMPS	
BUL1102E		450	1100	4	70	10	20	2	5	1.5	2	400	Lighting	
BUL310		500	1000	5	75	10	#	3	2.5	1.1	3	600	Lighting/SMPS	
BUL1203E		550	1200	5	100	9	28	2	5	1.5	3	1000	Lighting	
BUL213		600	1300	3	60	16	36	0.35	3	0.9	1	200	Lighting/SMPS	
BUL1403ED		650	1400	3	80	15		0.4	3	2.5	0.5	50	Lighting	
BUL1603ED		650	1600	3	80	15	40	0.4	3	1.5	1	250	Lighting	
BU505		700	1500	2.5	75					5	2	900	CTVs/Lighting	
BUL216		800	1600	4	90	12	40	0.4	5	1	1	200	Lighting/SMPS	
BUL416		800	1600	6	110	12	40	0.7	5	1.5	2	400	Lighting/SMPS	
BUH2M20AP		1200	2000	0.03	40	10		0.01	10	5	0.002	0.4	CTVs	

* D2PAK package in tape & reel (suffix "T4")

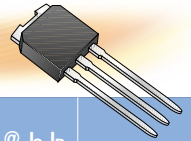
** I2PAK package in tubes (suffix "-1")

typical

DPAK



IPAK

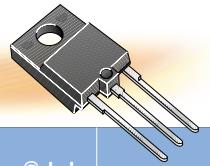


P/N		V _{CEO}	V _{CB0} V _{CES} V _{CEV}	I _C	P _{tot}	h _{FE} @ I _C V _{CE}		V _{CE(sat)} @ I _C I _B		Application			
NPN	PNP	(V)	(V)	(A)	(W)	min	max	(A)	(V)	(V)	(A)	(mA)	
MJD3055T4	MJD2955T4	60	70	10	20	20	100	4	4	1.1	4	400	Gen. Purp.
STD1802T4		60	80	3	15	200	400	0.1	2	0.4	3	150	Lighting
MJD31BT4	MJD32BT4	80	80	3	15	10	50	3	4	1.2	3	375	Gen. Purp.
MJD44H11T4	MJD45H11T4	80	80	10	20	40		4	1	1	8	400	Gen. Purp.
MJD112T4	MJD117T4	100	100	2	20	1000	12000	2	3	2	2	8	Gen. Purp.
MJD31CT4	MJD32CT4	100	100	3	15	10	50	3	4	1.2	3	375	Gen. Purp.
MJD122-1	MJD127-1	100	100	5	20	1000	12000	4	4	2	4	16	Gen. Purp.
MJD122T4	MJD127T4	100	100	5	20	1000	12000	4	4	2	4	16	Gen. Purp.
BULD116D-1		200	400	5	20	8	20	5	5	1.2	5	1	Lighting/SMPS
MJD47T4		250	350	1	15	30	150	0.3	10	1	1	200	Switching
MJD340T4	MJD350T4	300	300	0.5	15	30	240	0.05	10				Switching
MJD49T4		350	450	1	15	30	150	0.3	10	1	1	200	Switching
MJD50T4		400	500	1	15	30	150	0.3	10	1	1	200	Switching
	STD93003T4	400	500	1.5	20	16	32	0.35	5	0.5	0.35	50	Lighting
STD13003-1		400	700	1.5	20	5	25	1	2	1	1	250	Lighting/SMPS
STD83003T4		400	700	1.5	20	16	32	0.35	5	1	0.35	50	Lighting/SMPS
BULD118D-1		400	700	2	20	8	2	5	1.5	2	400	Lighting	
BUXD87-1		450	1000	0.5	20	12		0.04	5	1	0.2	20	SMPS
STD616A-1		450	1000	1.6	20	4		1.6	5	0.5	0.8	250	SMPS
STD616AT4		450	1000	1.6	20	4		1.6	5	0.5	0.8	250	SMPS
BULD1101ET4		450	1100	3	35	6	18	2	5	1	1	200	Lighting

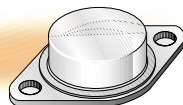
Suffix "T4" = DPAK package in tape & reel

Suffix "-1" = IPAK package in tube

ISOWATT218



P/N		V _{CEO}	V _{CB0} V _{CES} V _{CEV}	I _C	P _{tot}	h _{FE} @ I _C V _{CE}		V _{CE(sat)} @ I _C I _B		Application			
NPN	PNP	(V)	(V)	(A)	(W)	min	max	(A)	(V)	(V)	(A)	(mA)	
BU941ZPFI		350	350	15	65	300		5	10	1.8	10	250	Electr. Ignition
BUV48AFI		450	1000	15	55					1.5	8	1600	SMPS/Industr.
ST1802HI		600	1500	10	50	4	9	5	5	1.5	4	1200	CTVs/Monitors
ST1803DHI		600	1500	10	50	4	9	4.5	5	1.5	4	1200	CTVs
ST2001HI		600	1500	10	55	5	10	6	5	1.5	5	1250	CTVs/Monitors
ST2009DHI		600	1500	10	55	5	10	5.5	5	1.5	5	1250	CTVs
ST2310HI		600	1500	10	55	5	8	7	5	3	7	1750	CTVs/Monitors
ST2310DHI		600	1500	10	55	5.5	8.5	7	5	3	7	1750	CTVs
ST2408HI		600	1500	12	55	6	9	8	5	1.5	8	2000	CTVs/Monitors
BUV48CFI		700	1200	15	55					1.5	6	1500	SMPS/Industr.
BU808DFI		700	1400	8	52	60	270	5	5	1.6	5	500	CTVs
BUH315D		700	1500	6	44	4	9	3	5	1.5	3	1000	CTVs
BU508AFI		700	1500	8	50					1	4.5	2000	CTVs
BU508DFI		700	1500	8	50					1	4.5	2000	CTVs
S2000AFI		700	1500	8	50	2.25		4.5	1	1	4.5	2000	CTVs
BUH1015HI		700	1500	14	70	7	14	10	5	1.5	10	2000	CTVs/Monitors



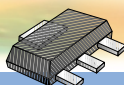
P/N		V _{CEO}	V _{CB0} V _{CES} V _{CEV}	I _C	P _{tot}	h _{FE} @ I _C V _{CE}				V _{CE(sat)} @ I _C I _B			Application
NPN	PNP	(V)	(V)	(A)	(W)	min	max	(A)	(V)	(V)	(A)	(mA)	
2N3771		40	50	30	150	15	60	15	4	2	15	1500	Gen. Purp.
2N3772		60	80	20	150	15	60	10	4	1.4	10	1000	Gen. Purp.
2N3055	MJ2955	60	100	15	115	20	70	4	4	1.1	4	400	Gen. Purp.
MJ3001	MJ2501	80	80	10	150	1000		5	3	2	5	20	Gen. Purp.
2N5886	2N5884	80	80	25	200	20	100	10	4	1	15	1500	Gen. Purp.
MJ11014		90	90	30	200	1000		20	5	3	20	200	Gen. Purp.
MJ802		90	100	30	200	25	100	7.5	2	0.8	7.5	750	Gen. Purp.
2N5038		90	150	20	140	20	100	12	5	1	12	1200	Gen. Purp.
2N6059		100	100	12	150	750		6	3	3	12	120	Gen. Purp.
MJ4035	MJ4032	100	100	16	150	1000		10	3	4	16	80	Gen. Purp.
2N6284	2N6287	100	100	20	160	750	18000	10	3	3	20	200	Gen. Purp.
BUX10		125	160	25	150	20	60	10	2	1.2	20	2000	Gen. Purp.
BUV20		125	160	50	250	20	60	25	2	1.2	50	5000	Gen. Purp.
BUT90		125	200	50	250					0.9	70	7000	Switching
BUT100		125	200	50	300					0.9	100	10000	Switching
BUV61		200	300	50	250					1.2	40	5000	Switching
BUR51		200	300	60	350	15		50	4	1	30	2000	Switching
BUX22		250	300	40	350	20	60	10	4	1.5	20	2500	Switching
BUT92		250	350	50	250					1.2	35	3500	Switching
BUR52		250	350	60	350	15		40	4	1	25	2000	Switching
BU931		400	500	15	175	300		5	10	1.8	8	100	Electr. Ignition
BU941		400	500	15	180	300		5	10	1.8	10	250	Electr. Ignition
2N6547		400	850	15	175	6		10	2	1.5	10	2000	SMPS/Industr.
BUX48		400	850	15	175					1.5	10	2000	SMPS/Industr.
BUX98		400	850	30	250					1.5	20	4000	SMPS/Industr.
BU326A		400	900	6	75	25 #		1	5	3	4	1250	Monochr. TVs
BUY69A		400	1000	10	100	15		2.5	10	3.3	8	2500	SMPS/Industr.
BUF420M		450	850	30	200					0.5 #	20	2000	SMPS/Industr.
BUX348		450	850	45	300					0.9	30	6000	SMPS/Industr.
BUX48A		450	1000	15	175					1.5	10	2000	SMPS/Industr.
BUX98A		450	1000	30	250					1.5	16	3200	SMPS/Industr.
BUX48C		700	1200	15	175					1.5	6	1500	SMPS/Industr.
BUX98C		700	1200	30	250					1.5	12	3000	SMPS/Industr.
BU208A		700	1500	8	150					1	4.5	2000	CTVs

Typical

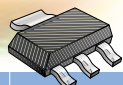
SOT23-6L



SOT-89



SOT-223



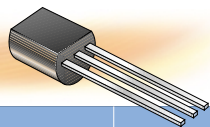
P/N		V _{CEO}	V _{CB0} V _{CES} V _{CEV}	I _C	P _{tot}	h _{FE} @ I _C V _{CE}				V _{CE(sat)} @ I _C I _B			Application
NPN	PNP	(V)	(V)	(A)	(W)	min	max	(A)	(V)	(V)	(A)	(mA)	
	STT818B **	30	30	3	1.2	100		2.5	3	0.5	2	20	Mobile Phone
STN1802 *		60	80	3	1.6	200	400	0.1	2	0.4	3	150	Lighting
STN851 *		60	150	5	1.6	150	350	2	1	0.45	5	200	Lighting
STF715 ◊	STF817 ◊	80	140	1	1.4	40		1	2	0.5	1	100	Gen. Purp.
STN715 *	STN817 *	80	140	1	1.6	40		1	2	0.5	1	100	Gen. Purp.
STN48 *		300	400		12.8	30	150	0.3	10	1	1	200	PCMCIA Card

* SOT-223 package

** SOT23-6L package

◊ SOT-89 package

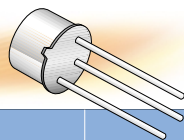
TO-92



P/N		V _{CEO} (V)	V _{CB0} V _{CES} V _{CEV} (V)	I _C (A)	P _{tot} (W)	h _{FE} @ I _C V _{CE}		V _{CE(sat)} @ I _C I _B			Application		
NPN	PNP					min	max	(A)	(V)	(V)		(A)	(mA)
STSA851		60	150	5	1.1	150	350	2	1	0.45	5	200	Lighting
STX715 *	STX817 *	80	140	1	0.9	40		1	2	0.5	1	100	Gen. Purp.
STX112		100	100	2	0.8	1000		1	4	2.5	2	8	Gen. Purp.
	STX93003	400	500	1	1.5	16	32	0.35	5	0.5	0.35	50	Lighting
STBV68		400	600	0.6	0.9	3	6	0.25	10	1.5	0.15	50	Lighting
STBV45		400	600	0.75	0.95	5	20	0.4	5	1.5	0.4	135	Lighting
STBV42		400	700	1	1	5	20	0.8	5	1.5	0.75	250	Lighting
STBV32		400	700	1	1.1	5	25	1	2	1	1	250	Lighting
STX13003		400	700	1	1.5	5	25	1	2	1	1	250	Lighting
STX83003		400	700	1	1.5	16	32	0.35	5	1	0.35	50	Lighting
STX13005		400	700	3	2.8	8	24	2	5	0.6	2	500	Lighting/SMPS

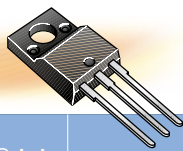
* Coming soon

TO-39



P/N		V _{CEO} (V)	V _{CB0} V _{CES} V _{CEV} (V)	I _C (A)	P _{tot} (W)	h _{FE} @ I _C V _{CE}		V _{CE(sat)} @ I _C I _B			Application		
NPN	PNP					min	max	(A)	(V)	(V)		(A)	(mA)
	BSS44	60	65	5	5	40	70	2	2	1	5	500	Gen. Purp.
BFX34		60	120	5	5	40	150	2	2	1	5	500	Gen. Purp.
		80	100	5	10	70	200	2.5	5	0.75	2.5	250	Gen. Purp.
		100	100	1	10	40	150	0.25	2	1	0.5	50	Gen. Purp.
2N5682		120	120	1	10	40	150	0.25	2	1	0.5	50	Gen. Purp.
	2N5415	200	200	1	10	30	150	0.05	10	2.5	0.05	5	Switching
BUY49S		200	250	3	10	40		0.5	5	0.2	0.5	50	Switching
2N3440		250	300	1	10	40	160	0.02	10	0.5	0.05	4	Switching
	2N5416	300	350	1	10	30	120	0.05	10	2.5	0.05	5	Switching
2N3439		350	450	1	10	40	160	0.02	10	0.5	0.05	4	Switching

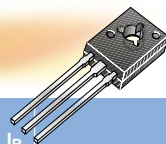
TO-220FP



P/N		V _{CEO} (V)	V _{CB0} V _{CES} V _{CEV} (V)	I _C (A)	P _{tot} (W)	h _{FE} @ I _C V _{CE}		V _{CE(sat)} @ I _C I _B			Application		
NPN	PNP					min	max	(A)	(V)	(V)		(A)	(mA)
2SD2012		60	60	3	25	100	320	0.5	5	1	2	200	Gen. Purp.
BDX53BFP		80	80	8	29	750		3	3	2	3	12	Gen. Purp.
BD241BFP	BD242BFP	80	90	3	24	25		1	4	1.2	3	600	Gen. Purp.
TIP122FP	TIP127FP	100	100	5	29	1000		3	3	2	3	12	Gen. Purp.
BDW93CFP	BDW94CFP	100	100	12	33	750		5	3	2	5	20	Gen. Purp.
BUL128FP		400	700	4	31	15		1	5	1.5	2.5	500	Lighting/SMPS
BUL903EDFP		400	900	5	70	25	50	0.5	5	1.2	2	400	Lighting
BUL1102EFP		450	1100	4	30	10	20	2	5	1.5	2	400	Lighting
BUL310FP		500	1000	5	36	10 #		3	2.5	1.1	3	600	Lighting/SMPS

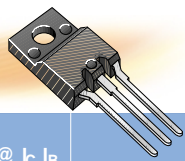
Typical

SOT-32 / TO-126



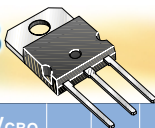
P/N		V _{CEO}	V _{CB0} V _{CES} V _{CEV}	I _C	P _{tot}	h _{FE} @ I _C V _{CE}				V _{CE(sat)} @ I _C I _B		Application	
NPN	PNP	(V)	(V)	(A)	(W)	min	max	(A)	(V)	(V)	(A)	(mA)	
BD433	BD434	22	22	4	36	5		2	1	0.5	2	200	Gen. Purp.
	MJE210	25	40	5	15	45	180	2	1	1.8	5	1000	Gen. Purp.
BD435	BD436	32	32	4	36	50		2	1	0.5	2	200	Gen. Purp.
MJE521		40	40	4	40	40		1	1				Gen. Purp.
BD135	BD136	45	45	1.5	12.5	40	250	0.15	2	0.5	0.5	50	Gen. Purp.
BD135-10	BD136-10	45	45	1.5	12.5	63	160	0.15	2	0.5	0.5	50	Gen. Purp.
BD135-16	BD136-16	45	45	1.5	12.5	100	250	0.15	2	0.5	0.5	50	Gen. Purp.
BD437	BD438	45	45	4	36	40		2	1	0.6	2	200	Gen. Purp.
	BD138	60	60	1.5	12.5	40	250	0.15	2	0.5	0.5	50	Gen. Purp.
BD235	BD236	60	60	2	25	25		1	2	0.6	1	100	Gen. Purp.
BD439	BD440	60	60	4	36	25			1	0.8	2	200	Gen. Purp.
2N5191		60	60	4	40	25	100	1.5	2	1.4	4	1000	Gen. Purp.
BD677	BD678	60	60	4	40	750		1.5	3	2.5	1.5	30	Gen. Purp.
BD677A	BD678A	60	60	4	40	750		2	3	2.8	2	40	Gen. Purp.
2N4923		80	80	1	30	30	150	0.5	1	0.6	1	100	Gen. Purp.
BD139	BD140	80	80	1.5	12.5	40	250	0.15	20.5	0.5	50		Gen. Purp.
BD139-10	BD140-10	80	80	1.5	12.5	63	160	0.15	2	0.5	0.5	50	Gen. Purp.
BD139-16	BD140-16	80	80	1.5	12.5	100	250	0.15	2	0.5	0.5	50	Gen. Purp.
BD179		80	80	3	30	40		0.15	2	0.8	1	100	Gen. Purp.
BD441	BD442	80	80	4	36	15		2	1	0.8	2	200	Gen. Purp.
2N5192	2N5195	80	80	4	40	20	80	1.5	2	1.4	4	1000	Gen. Purp.
2N6039	2N6036	80	80	4	40	750	15000	2	3	2	2	8	Gen. Purp.
BD679	BD680	80	80	4	40	750		1.5	3	2.5	1.5	30	Gen. Purp.
BD679A	BD680A	80	80	4	40	750		2	3	2.8	2	40	Gen. Purp.
MJE802		80	80	4	40	750		1.5	3	3	4	40	Gen. Purp.
BD237	BD238	80	100	2	25	25		1	2	0.6	1	100	Gen. Purp.
MJE182	MJE172	80	100	3	12.5	12		1.5	1	0.9	1.5	150	Gen. Purp.
BD681	BD682	100	100	4	40	750		1.5	3	2.5	1.5	30	Gen. Purp.
MJE3440		250	350	0.3	15	50	200	0.02	10	0.5	0.05	4	Switching
MJE340	MJE350	300	300	0.5	20	30	240	0.05	10				Switching
2N5657		350	375	0.5	20	30	250	0.1	10	2.5	0.25	25	Switching
	ST93003	400	500	1.5	40	16	32	0.35	5	0.5	0.35	50	Lighting
ST13003		400	700	1.5	40	5	25	1	2	1	1	250	Lighting/SMPS
ST83003		400	700	1.5	40	16	32	0.35	5	1	0.35	50	Lighting/SMPS
BULT118		400	700	2	45	8		2	5	1.5	2	400	Lighting/SMPS
BULT118D		400	700	2	45	10	50	0.5	5	1	1	200	Lighting/SMPS
BUX87		450	1000	0.5	40	12		0.04	5	1	0.2	20	SMPS

TO-220FH

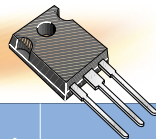


P/N		V _{CEO}	V _{CB0} V _{CES} V _{CEV}	I _C	P _{tot}	h _{FE} @ I _C V _{CE}				V _{CE(sat)} @ I _C I _B		Application	
NPN	PNP	(V)	(V)	(A)	(W)	min	max	(A)	(V)	(V)	(A)	(mA)	
BUL312FH		500	1150	5	36	8	16	3	2.5	1.1	3	600	SMPS
ST1802FH		600	1500	10	40	4	9	5	5	1.5	4	1200	CTVs
ST1803DFH		600	1500	10	40	4	9	4.5	5	1.5	4	1200	CTVs
BU808DFH		700	1400	8	42	60	270	5	5	1.6	5	500	CTVs
BUH315DFH		700	1500	6	40	4	9	3	5	1.5	3	1000	CTVs

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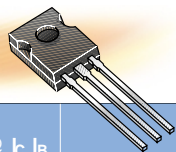
TO-247



P/N		V _{CEO}	V _{CB0} V _{CEV} V _{CEV}	I _C	P _{tot}	h _{FE} @ I _C V _{CE}		V _{CE(sat)} @ I _C I _B			Application				
NPN	PNP	(V)	(V)	(A)	(W)	min	max	(A)	(V)	(V)	(A)	(mA)			
TIP140	TIP145	60	60	10	125	1000		5	4	3	10	40	Gen. Purp.		
TIP3055	TIP2955	60	70	15	90	20		4	4	1.1	4	400	Gen. Purp.		
TIP33A		60	100	10	80	20	100	3	4	1	3	300	Gen. Purp.		
BUW48		60	120	30	150					1.4	40	4000	Gen. Purp.		
TIP141	TIP146	80	80	10	125	1000		5	4	2	5	10	Gen. Purp.		
	TIP36B	80	80	25	125	15	75	15	4	1.8	15	1500	Gen. Purp.		
SGSD100	SGSD200	80	80	25	130	300				20	3	1.75	10	40	Gen. Purp.
BUW49		80	160	30	150					1.2	30	3000	Gen. Purp.		
TIP142	TIP147	100	100	10	125	1000		5	4	2	5	10	Gen. Purp.		
BDW83C	BDW84C	100	100	15	130	750	20000	6	3	2.5	6	12	Gen. Purp.		
TIP35C	TIP36C	100	100	25	125	15	75	15	4	1.8	15	1500	Gen. Purp.		
TIP33C	TIP34C	100	140	10	80	20	100	3	4	1	3	300	Gen. Purp.		
BUT70W *		125	200	40	200					0.9	70	7000	Switching		
BUTW92 *		250	500	60	180	9		60	3	1	60	15000	Switching		
BU941ZP		350	350	15	155	300		5	10	1.8	10	250	Electr. Ignition		
BU931P		400	500	15	135	300		5	10	1.8	10	250	Electr. Ignition		
BU941P		400	500	15	155	300		5	10	1.8	10	250	Electr. Ignition		
BU426A		400	900	6	114	30 #		0.6	5	1.5	2.5	500	Monochr. TVs		
BUF410		450	850	15	125					0.5 #	10	2000	SMPS		
BUF410A		450	1000	15	125					0.5 #	10	2000	SMPS		
BUL810		450	1000	15	125	10	40	5	5	1.5	8	1600	Lighting/SMPS		
BUV48A		450	1000	15	125					1.5	10	2000	SMPS/Industr.		
BUX98APW *		450	1000	24	200					1.2	16	3200	SMPS/Industr.		
BUF420AW *		450	1000	30	200					0.5 #	20	2000	SMPS/Industr.		
BUV48C		700	1200	15	125					1.5	6	1500	SMPS/Industr.		
BU508A		700	1500	8	125					1	4.5	2000	CTVs		
BUW1015 *		700	1500	14	160	7	14	10	5	1.5	10	2000	CTVs/Monitors		
BUW1215 *		700	1500	16	200	7		12	5	1.5	12	2400	CTVs/Monitors		

* TO-247 package # Typical

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P/N		V _{CEO}	V _{CB0} V _{CEV} V _{CEV}	I _C	P _{tot}	h _{FE} @ I _C V _{CE}		V _{CE(sat)} @ I _C I _B			Application		
NPN	PNP	(V)	(V)	(A)	(W)	min	max	(A)	(V)	(V)	(A)	(mA)	
	BD336	100	100	6	60	750		3	3	2	3	12	Gen. Purp.
STK13003		400	700	1.5	40	5	25	1	2	1	1	250	Lighting/SMPS
BULK118		400	700	2	45	8		2	5	1.5	2	400	Lighting/SMPS
BULK128		400	700	4	55	14	28	2	5	1.5	2.5	500	Lighting/SMPS
BULK128D-B		400	700	4	55	8	40	2	5	1.5	2.5	500	Lighting/SMPS
BULK38D		450	800	5	60	8		2	5	1.1	3	750	Lighting/SMPS

ST preferred products in bold, blue shaded areas indicate Darlington



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