

ANEXOS

Anexo 1: Valores normalizados de componentes electrónicos.....	25
Anexo 2: Tablas de datos de diodos zener.....	26
Anexo 3: Tablas de datos de diodos rectificadores y transistores bipolares.....	28
Anexo 4: Código de colores de resistencias y condensadores	35
Anexo 5: Tabla de datos del FET BF245	36
Anexo 6: Tabla de datos del MOSFET IRF510.....	39
Anexo 7: Listado de componentes	42

ANEXO 1: VALORES NORMALIZADOS DE COMPONENTES ELECTRÓNICOS

La escala EX (X = 6...192) contiene X valores normalizados por década, obtenidos por redondeo de los términos de una progresión geométrica de razón $10^{1/X}$. La tolerancia de las distintas escalas se muestra a continuación:

Escala	E 6	E 12	E 24	E 48	E 96	E 192
Tolerancia %	±20	±10	±5	±2	±1	±0.5

E 6	E 12	E 24	E 48				E 96				E 192				
1.0	1.0	1.0	1.00	1.78	3.16	5.62	1.00	1.78	3.16	5.62	1.00	1.78	3.16	5.62	
		1.1									1.01	1.80	3.20	5.69	
	1.2	1.2					1.02	1.82	3.24	5.76	1.02	1.82	3.24	5.76	
		1.3									1.04	1.84	3.28	5.83	
1.5	1.5	1.5	1.05	1.87	3.32	5.90	1.05	1.87	3.32	5.90	1.05	1.87	3.32	5.90	
		1.6									1.06	1.89	3.36	5.97	
	1.8	1.8					1.07	1.91	3.40	6.04	1.07	1.91	3.40	6.04	
		2.0									1.09	1.93	3.44	6.12	
2.2	2.2	2.2													
		2.4					1.10	1.96	3.48	6.19	1.10	1.96	3.48	6.19	
	2.7	2.7									1.11	1.98	3.52	6.26	
		3.0					1.13	2.00	3.57	6.34	1.13	2.00	3.57	6.34	
3.3	3.3	3.3									1.14	2.03	3.61	6.42	
		3.6					1.15	2.05	3.65	6.49	1.15	2.05	3.65	6.49	
	3.9	3.9									1.17	2.08	3.70	6.57	
		4.3					1.18	2.10	3.74	6.65	1.18	2.10	3.74	6.65	
4.7	4.7	4.7									1.20	2.13	3.79	6.73	
		5.1													
	5.6	5.6					1.21	2.15	3.83	6.81	1.21	2.15	3.83	6.81	
		6.2									1.23	2.18	3.88	6.90	
6.8	6.8	6.8					1.24	2.21	3.92	6.98	1.24	2.21	3.92	6.98	
		7.5									1.26	2.23	3.97	7.06	
	8.2	8.2					1.27	2.26	4.02	7.15	1.27	2.26	4.02	7.15	
		9.1									1.29	2.29	4.07	7.23	
							1.30	2.32	4.12	7.32	1.30	2.32	4.12	7.32	
											1.32	2.34	4.17	7.41	
							1.33	2.37	4.22	7.50	1.33	2.37	4.22	7.50	
											1.35	2.40	4.27	7.59	
							1.37	2.43	4.32	7.68	1.37	2.43	4.32	7.68	
											1.38	2.46	4.37	7.77	
1.40	2.49	4.42	7.87	1.40	2.49	4.42	7.87	1.40	2.49	4.42	7.87	1.40	2.49	4.42	7.87
											1.42	2.52	4.48	7.96	
							1.43	2.55	4.53	8.06	1.43	2.55	4.53	8.06	
											1.45	2.58	4.59	8.16	

ANEXO 2: TABLAS DE DATOS DE DIODOS ZENER

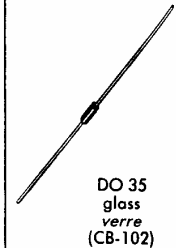
zener diodes diodes zener

Types	V_{ZT}/I_{ZT}^*		r_{ZT}/I_{ZT}^*	I_{ZT}^*	r_{ZK}/I_{ZK}		α_{VZ}		I_R / V_R		V_R	I_{ZM}	I_{ZSM}	Case
	min	max	max	(mA)	max	(mA)	min	max	T_{amb} 25°C	T_{amb} 150°C				
	(V)		(Ω)		(Ω)	(mA)	(10 ⁻⁴ /°C)		max	max	(V)	(mA)	(mA)	

500 mW / $T_{amb} = 25^\circ\text{C}$ $T_j \text{ max} = 175^\circ\text{C}$

$V_F \leq 1,5 \text{ V}$ ($T_{amb} = 25^\circ\text{C}$, $I_F = 0,2\text{A}$)

BZX 55 C 0V8 (1)	0,73	0,83	8	5	600	1								
BZX 55 C 2V4	2,28	2,56	85	5	600	1	-8	-6	50	100	1	155	1720	
•• BZX 55 C 2V7	2,5	2,9	85	5	600	1	-8	-6	10	50	1	135	1600	
•• BZX 55 C 3V0	2,8	3,2	85	5	600	1	-8	-6	4	40	1	125	1500	
•• BZX 55 C 3V3	3,1	3,5	85	5	600	1	-8	-5	2	40	1	115	1400	
•• BZX 55 C 3V6	3,4	3,8	85	5	600	1	-8	-4	2	40	1	105	1330	
•• BZX 55 C 3V9	3,7	4,1	85	5	600	1	-7	-3	2	40	1	95	1270	
•• BZX 55 C 4V3	4,0	4,6	75	5	600	1	-4	-1	1	20	1	90	1220	
•• BZX 55 C 4V7	4,4	5,0	60	5	600	1	-3	1	0,5	10	1	85	1160	
•• BZX 55 C 5V1	4,8	5,4	35	5	550	1	-2	5	0,1	2	1	80	1100	
•• BZX 55 C 5V6	5,2	6,0	25	5	450	1	-1	6	0,1	2	1	70	1040	
•• BZX 55 C 6V2	5,8	6,6	10	5	200	1	0	7	0,1	2	2	64	980	
•• BZX 55 C 6V8	6,4	7,2	8	5	150	1	1	8	0,1	2	3	58	900	
•• BZX 55 C 7V5	7,0	7,9	7	5	50	1	1	9	0,1	2	5	53	810	
•• BZX 55 C 8V2	7,7	8,7	7	5	50	1	1	9	0,1	2	6,2	47	760	
•• BZX 55 C 9V1	8,5	9,6	10	5	50	1	2	10	0,1	2	6,8	43	670	
•• BZX 55 C 10	9,4	10,6	15	5	70	1	3	11	0,1	2	7,5	40	600	
•• BZX 55 C 11	10,4	11,6	20	5	70	1	3	11	0,1	2	8,2	36	550	
•• BZX 55 C 12	11,4	12,7	20	5	90	1	3	11	0,1	2	9,1	32	500	
•• BZX 55 C 13	12,4	14,1	26	5	110	1	3	11	0,1	2	10	29	450	
•• BZX 55 C 15	13,8	15,6	30	5	110	1	3	11	0,1	2	11	27	380	
•• BZX 55 C 16	15,3	17,1	40	5	170	1	3	11	0,1	2	12	24	350	
•• BZX 55 C 18	16,8	19,1	50	5	170	1	3	11	0,1	2	13	21	300	
•• BZX 55 C 20	18,8	21,2	55	5	220	1	3	11	0,1	2	15	20	270	
•• BZX 55 C 22	20,8	23,3	55	5	220	1	3	11	0,1	2	16	18	250	
•• BZX 55 C 24	22,8	25,6	80	5	220	1	4	12	0,1	2	18	16	225	
•• BZX 55 C 27	25,1	28,9	80	5	220	1	4	12	0,1	2	20	14	200	
•• BZX 55 C 30	28	32	80	5	220	1	4	12	0,1	2	22	13	190	
•• BZX 55 C 33	31	35	80	5	220	1	4	12	0,1	2	24	12	175	
•• BZX 55 C 36	34	38	80	5	220	1	4	12	0,1	2	27	11	160	
•• BZX 55 C 39	37	41	90	2,5	500	0,5	4	12	0,1	5	30	10	148	
•• BZX 55 C 43	40	46	90	2,5	600	0,5	4	12	0,1	5	33	9,2	135	
•• BZX 55 C 47	44	50	110	2,5	700	0,5	4	12	0,1	5	36	8,5	123	
•• BZX 55 C 51	48	54	125	2,5	700	0,5	4	12	0,1	10	39	7,8	113	
•• BZX 55 C 56	52	60	135	2,5	1000	0,5	4	12	0,1	10	43	7,0	104	
•• BZX 55 C 62	58	66	150	2,5	1000	0,5	4	12	0,1	10	47	6,4	93	
•• BZX 55 C 68	64	72	200	2,5	1000	0,5	4	12	0,1	10	51	5,9	87	
•• BZX 55 C 75	70	80	250	2,5	1500	0,5	4	12	0,1	10	56	5,3	79	
•• BZX 55 C 82	77	87	300	2,5	2000	0,5	4	12	0,1	10	62	4,8	72	
•• BZX 55 C 91	85	96	450	1	5000	0,1	4	12	0,1	10	68	4,4	65	
BZX 55 C 100	94	106	450	1	5000	0,1	4	12	0,1	10	75	4,0	59	
BZX 55 C 110	104	116	600	1	5000	0,1	4	12	0,1	10	82	3,6	54	
BZX 55 C 120	114	127	800	1	5000	0,1	4	12	0,1	10	91	3,3	49	
BZX 55 C 130	124	141	1000	1	5000	0,1	4	12	0,1	10	100	3,0	45	
BZX 55 C 150	138	156	1200	1	5000	0,1	4	12	0,1	10	110	2,6	39	
BZX 55 C 160	153	171	1500	1	5000	0,1	4	12	0,1	10	120	2,5	37	
BZX 55 C 180	168	191	1800	1	5000	0,1	4	12	0,1	10	130	2,2	33	
BZX 55 C 200	188	212	2000	1	5000	0,1	4	12	0,1	10	150	2,0	30	



DO 35
glass
tube
(CB-102)

*Pulse test $20 \text{ ms} \leq t_p \leq 50 \text{ ms}$ $\delta < 2\%$.
The regulation voltages are defined according to the E 24 series.

Tight voltage tolerances :
BZX 55 B 2V4 thru BZX 55 B 100 : $\pm 2\%$.
BZX 55 A 2V4 thru BZX 55 A 56 : $\pm 1\%$.

- Devices under CCQ/CECC.
- ESA qualified product.
- (1) BZX 55 C 0V8 is to be used with forward bias.

*Mesure en impulsion $20 \text{ ms} \leq t_p \leq 50 \text{ ms}$ $\delta < 2\%$.
Les tensions de régulation sont définies selon la série E24.

Tolérances plus faibles :
BZX 55 B 2V4 jusqu'à BZX 55 B 100 : $\pm 2\%$.
BZX 55 A 2V4 jusqu'à BZX 55 A 56 : $\pm 1\%$.

- Dispositifs soumis au CCQ/CECC.
- Produit qualifié ESA.
- (1) BZX 55 C 0V8 doit être utilisée avec une polarisation directe.

zener diode selector guide guide de sélection diodes zener

P (W)	V _{Z nom} (V)		Case
	0,8 2,4 2,7 3,3 4,7 6,8 10 75 200		
glass cases/boîtiers verre			
0,4		1N 4370 A... 1N 746 A... 1N 957 B... • T-LVA...	
0,5		BZX 55 C... BZX 83 C... 1N 5221 B...	DO 35
1		1N 4728 A... 1N 4187 B...	DO 41
1,3		BZX 85 C...	
5		1N 4954...	CB-422

ANEXO 3: TABLAS DE DATOS DE DIODOS Y TRANSISTORES BIPOLARES

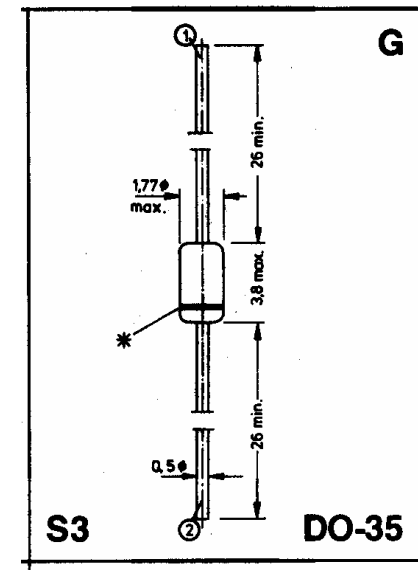
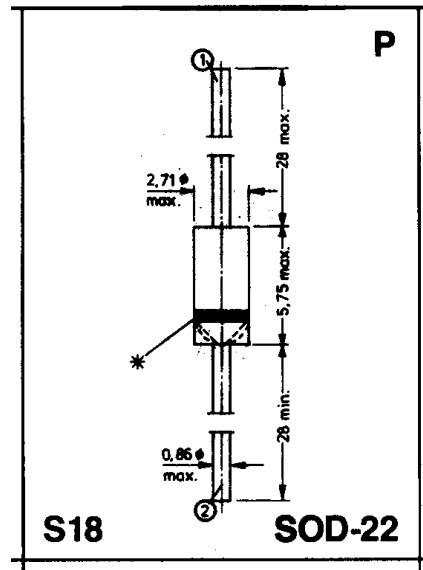
1N3993.....1N4015					GRENZDATEN							KENNDATEN											Selector						
Typ Type Tipo	Hersteller Manufact. Produttori	Mat. Mat. Mat.	Bild Fig. Fig.	Anwendung Application Applicazione	I_{UR} I_{URM} & I_{UR}	I_{F} I_{AV} & I_{Z}	I_{FM} I_{FRM} & I_{FSM}	T_U T_G & T_K	P_{tot} P_{BR} & P_{in}	T_U T_G & T_K	R_{thU} R_{thG} & R_{thK}	T_j T_U & T_{oper}	U_F U_Z & U_{BR}	$\Delta U / \Delta T$	$C_{[PF]}$ C_C / C_1 & $t_{[GHz]}$	r_s r_z & r_r	Q Q_n & Q_F	I_F I_Z & I_R	U_R U_{HF}	f	L_s	t_{rr} $t_{Q,rr}$	$I_F \rightarrow I_R$ $I_F \rightarrow U_R; I_R$	I_R I_F & I_Z	U_R U_F & U_Z	T_U T_G & T_j	Tafel-Nr. Table-No. Tabelle-No.		
			*A/B/C /D/E/F	*Farb-Code Typ-Code	max. V	max. A	max. A	max. °C	max. W	max. °C	max. °C/W	max. °C	min...max. V	10 ⁻³ /°C mV/°C	min...max.	Ω	% &dB	mA	V	MHz	nH	ns nAs	mA mA &mA	max. μA	V	°C	(Section 5)		
1N3993	Idc, Mot, Sem, Sie, Scn, Sai	Si	K9a/e5	Z-L, 10%		*2,38	75	10	555	10	175		1,5 53,9	-4,6		\$<2	2A 5640								100	0,5	530	BZ/2	
1N3994	=1N3993	Si	K9a/a5	=1N3993:		*2,13	75						54,3	-3,3		\$<1,5	5580							100	0,5	530			
1N3995	=1N3993	Si	K9a/a5	=1N3993:		*1,94	75						54,7	-1,5		\$<1,2	5530							50	1	530			
1N3996	=1N3993	Si	K9a/a5	=1N3993:		*1,78	75						55,1	1		\$<1,1	5490							10	1	530			
1N3997	=1N3993	Si	K9a/a5	=1N3993:		*1,62	75						55,6	3		\$<1	5445							10	1	530			
1N3998	=1N3993	Si	K9a/a5	=1N3993:		*1,46	75						56,2	4,9		\$<1,1	5405							10	2	530			
1N3999	=1N3993	Si	K9a/a5	=1N3993:		*1,33	75						56,8	4		\$<1,2	5370							10	2	530			
1N4000	=1N3993	Si	K9a/a5	=1N3993:		*1,21	75						57,5	4,6		\$<1,3	5335							10	3	530			
1N3993A ...1N4000A																													
1N4001*	Arg, Ed, Fch, Sec, Fer, Ga, Itr, Mot, Mic, Inv, Sm, Sie, Sec, Sol, Tix, Tot, Wrs, Val	Si	S18/a	GI, Uni	50 5-	\$1	\$30	75				80	175	1,1				1A						10	max	\$25	BY/1		
1N4002	=1N4001	Si	S18/a	=1N4001:	100																			50	max	\$100			
1N4003	=1N4001	Si	S18/a	=1N4001:	200																								
1N4004	=1N4001	Si	S18/a	=1N4001:	400																								
1N4005	=1N4001	Si	S18/a	=1N4001:	600																								
1N4006	=1N4001	Si	S18/a	=1N4001:	800																								
1N4007	=1N4001	Si	S18/a	=1N4001:	1000																								
1N4001(GIP ...4007(GIP	Ge		S18/a											15				4	1		20μ	20;	1						
1N4008	Idc, Sem, Sld, Spe	Ge	S6/a	S	12	\$0,1	25					90	0,5				10	0					<70	10;	1	25	12	45	AA/3
1N4009	Fch, Gen, Mec, Phi, Sem, See, Tix	Si	S6/a	SS	25 \$35	\$0,1 0,2	0,5 25	25	0,25	25		175	1		4			30	0	1			<4 <2	10; \$10-8;	1	0,1 100	25 25	25 150	BA/3b
1N4010	Idc, Mec, Sem, Sie	Si	S6/a	Z-Ref, 5%					0,4	25		100	56,2	±1		\$<15	57,5												BZ/4
1N4011	Sem, Sai	Si	S32/a	GI	1000	\$0,5	100					175	1,1					500						10	1000	25	100	BA/1 BY/1	
1N4012	Edi, Idc, Scn, Sem, Sai	Si	K9a/a5	GI-L	700	\$12	\$200	\$150				175	1,3					12A						10	max	\$25	BY/2b		
1N4013	=1N4012	Si	K9a/a5	=1N4012:	800																			500	max	\$150			
1N4014	=1N4012	Si	K9a/a5	=1N4012:	900																								
1N4015	=1N4012	Si	K9a/a5	=1N4012:	1000																								

* = 1N4001...4007G: Fig. S4/a
 1N4001...4007K(KS) hi-rel
 1N4001...4007S Fig. S4/a

1N4136. 1N4157					GRENZDATEN										KENNDATEN										Selector			
Typ	Hersteller	Mat.	Bild	Anwendung	U _{RM}	I _F	I _{FM}	T _U	P _{tot}	R _{thU}	T _J	U _F	ΔU/	C	r _s	Q	I _F	U _R	f	L _s	t _{rr}	I _R	I _R	U _R	T _U	Tafel-Nr.		
Type	Fabricants	Mat.	Fig.	Application	&U _{eff}	&I _{off}	&I _{FSM}	&T _G	&P _{In}	&R _{thG}	&T _{oper}	&U _{BR}	ΔT	&C _p	&r _r	&F	&I _Z	&U _{HF}	&f	nH	ns	I _F	I _F	&U _F	&T _G	Table-No.		
Tipo	Produttori	Mat.	*A/B/C	*Farb-Code	max.	max.	max.	max.	max.	°C/W	max.	min...max.	10 ⁻³ /°C	min...max.	Ω	%	mA	V	MHz		5nAs	mA	mA	max.	V	°C	Tabella-No.	
			/D/E/F	Typ-Code	V	A	A	°C	W	°C	°C/W	V	°C			&dB	mA	V	MHz	nH	ns	mA	mA	μA	V	°C	(Section 5)	
1N4136	Edl, Idc, Sem, Ssl, Wht	Si	K10/a5	GI-L	200	\$70	\$100				175	1,6											48m	max	\$175	BY/2b		
1N4137	=1N4136	Si	K10/a5	-1N4136:	400																		36m	max	\$175			
1N4138	=1N4136	Si	K10/a5	-1N4136:	600																		24m	max	\$175			
1N4139	Edl, Idc, Sem, Sol, Ssl, Gie	Si	S17/a	GI	50	\$3	\$300	50			175	1											200	max	50	BY/1		
1N4140	=1N4139	Si	*9/7/-/19/-/1,1	-1N4139:	100																							
1N4141	=1N4139	Si		-1N4139:	200																							
1N4142	=1N4139	Si		-1N4139:	400																							
1N4143	=1N4139	Si		-1N4139:	600																							
1N4144	=1N4139	Si		-1N4139:	800																							
1N4145	=1N4139	Si		-1N4139:	1000																							
1N4146	=1N4139	Si		-1N4139:	1200																							
1N4147	Idc, Msc, Sem, Ssl	Si	S6/a	S	30						150	1									10	10;	1	0,1	10	25	BA/3a-b	
1N4148	Ag, Fch, Htt, Itt, Phi, Sem, Ssa, Ssd, Sld, Tix, Tos, Val	Si	S3/a	SS	75	\$75m	25	25	0,5	25	350	200	1										25n	20	25			
1N4149	=1N4148	Si	S3/a	-1N4148:	\$100	0,2	\$0,5	25										4	\$2	100		<8	10;	1	5	75	25	
																		2	0			<4	\$10-6;	50	20	150		
1N4150	Fch, Gen, Htt, Idc, Itt, Phi, Sem, Ssa, Ssd, Tix, Uni, Val	Si	S3/a	SS	50	0,2	0,6	25	0,5	25	350	200	0,74										400;	40	0,1	50	25	
													0,92									<4	200;	20	100	50	150	BA/3b
													1					10	0	1		<4	400;	40	0,1	50	25	
1N4151	Ag, Fch, Htt, Gen, Itt, Phi, Sem, Ssa, Ssd, Tix, Uni, Val	Si	S3/a	SS	50	\$0,15	0,45	25	0,5	25	350	200	1										400;	40	0,1	50	25	
					\$75	0,2	25	25										2	\$2	100		<2	\$10-6;	50	50	150		
1N4152	=1N4151	Si	S3/a	SS	30	\$0,15	0,45	25	0,5	25	350	200	0,67										400;	40	0,1	50	25	
					\$40	0,2	25	25					0,7					2	0	1		<4	10;	1	0,05	max	25	
													0,81					10	0	1		<2	\$10-6;	50	max	150		
1N4153	=1N4151	Si	S3/a	-1N4152:	50																							
					\$75																							
1N4154	=1N4151	Si	S3/a	SS	25	\$0,15	0,45	25	0,5	25	350	200	1											400;	40	0,1	25	25
					\$35	0,2	25	25										4	\$2	100		<4	10;	1	100	25	150	BA/3b
																						<2	\$10-6;	100	25	150		
1N4155	Idc, Scn	Si	S6/a	S, Uni	400	\$0,2	25				150	1																
1N4156	Gen, Idc, Scn, Sem	Si	S6/a	Stabi	20						375	175	1,41															
													1,84															
1N4157	=1N4156	Si	S6/a	-1N4156:									2,05															
													2,66															

	1	2	3	4	
a	A	K ¹			a
b	K	A ²			b
c	A		K		c
c1	A	A	K		c1
d	K		A		d
d1	K	K	A		d1
e		A	K		e
f		K	A		f
g	A	K	Geh		g
h	K	A	Geh		h
j	A	K	A		j
k					k
l	A1	A2	K1-2		l
l1	K1-2	A2	A1		l1
m	K1	K2	A1-2		m
m1	A1-2	K2	K1		m1
n	A1	K2	A2/K1		n
n1	A1	A2/K1	K2		n1
o	K1	A2	A1/K2		o
o1	K1	A1/K2	A2		o1
p	A2	K1-2	A1		p
q	K2	A1-2	K1		q
r	A1	A2	A3	K1-3	r
r1	A1	A2	K1-3	A3	r1
r2	K1-3	A1	A2	A3	r2
s	K1	K2	K3	A1-3	s
s1	K1	K2	A1-3	K3	s1
t	K		A	Geh	t
t1	A		K	Geh	t1
u	A2/K1	A1	Geh	K2	u
u1	A2/K1	K2	Geh	A1	u1
v	A	A	K	K	v
v1	K	K	A	A	v1
w	~	—	~	+	w
x	—	~	+	~	x
x1	+	~	~	—	x1
x2	+	—	~	~	x2
x3	+	~	—	~	x3
x4	—	~	~	+	x4
y	A1/K4	A2/K1	A3/K2	A4/K3	y
z	Aufdruck/Imprint/Impr.				z
§	K+Geh/Case/Boite/Invol/Cajas				§
&	A+Geh/Case/Boite/Invol/Cajas				&

¹ = A2 ² = K2 (bidirektional-Di)



BC 100 BC 117					GRENZDATEN							
Typ Type Tipo	Hersteller Manufact. Fabricants Produttori	M/Pol M/Pol M/Pol	Bild Fig. Fig. Pint-Code	Anwendung Application Applicazione	U _{CE0} U _{CEB}	U _{CE0} U _{CEB}	U _{EB0}	I _C I _{CM} & I _B * I _{BM}	P _{tot}	T _U T _U & T _K	R _{thU} R _{thG}	T _J T _U
					max. V	max. V	max. V	max. mA	max. W	°C	°C/W	max. °C
BC 100	Aeg	Si-N	A39/a5	Vid-E	350	300	7	150	0,6	25		
BC 101	ldr	Si-N	A5/a		40		7	40	0,3	25	500	
BC 107	Aeg, Dlt, Itt, Mj, Mla, Mul, Phi, Rtc, Sgs, Sie, Tra, Val	Si-N	A3/a5	Uni kompl.: BC 177, BC 261	50	45 & 50	6	100 \$200 & 50	0,3	25 \$115	500 \$200	175
BC 107A BC 107B BC 107P(A..B) BC 107P(A..B)	Fer Tix		D5/e D10/a									
BC 108	-BC 107:	Si-N	A3/a5	kompl.: BC 178, BC 262	30	20 & 30	5					
BC 108A BC 108B BC 108C BC 108P(A..C) BC 108P(A..C)	Fer Tix		D5/e D10/a									
BC 109	-BC 107: re	Si-N	A3/a5	kompl.: BC 179, BC 263	30	20 & 30	5					
BC 109P(B..C) BC 109P(B..C) BC 109P(B..C)	Fer Tix		D5/e D10/a									
BC 110	Aeg, Sie	Si-N	A3/a5	Uni	80	80	8	80 & 10	0,3 0,3	25 \$115	500 \$200	175
BC 111	Rtc	Si-N	B3/a	Min, NF	20	20	3	80	0,03	25		
BC 112	Val	Si-N	E13/b	Min, NF	20	20	4	80	0,05	45	1600	125
BC 112rot BC 112gelb BC 112grün												
BC 113	Nac, Sgs	Si-N	A17/a	Uni	30	30	6	80	0,16 0,2	45 25	500 \$200	125
BC 113A					40	40						
BC 114 BC 114A	Nac, Sgs	Si-N	A17/a	-BC 113: re	40	40						
BC 115	Nac, Sgs	Si-N	A61/e	NF-Tr	40	30	5	200	0,24 0,3	45 25	333 \$125	125
BC 116	Nac, Sgs	Si-P	A61/a	Uni	45	40	5	500	0,3 0,8	25 \$25	333 \$125	125
BC 116A												
BC 117	Sgs	Si-N	A61/a	NF	120	120	5	80	0,3 0,8	25 \$25	333 \$125	125

KENNDATEN															
B (h _{FE}) β (h _{re}) & U _{BE}	f _T f _α & f _β	F S _{Vp} & ΔV _p F _c	I _C I _{CE}	U _{CE} U _{CEB} & U _{CE0}	f	t _{on} t _d & t _r	t _{off} t _s & t _r	U _{CE} U _{BE} sat	I _C	I _B	I _{CE0} I _{CEB} & I _{CE0}	U _{CE} U _{CEB} & U _{CE0}	T _U T _U & T _J	C _{CB0} C _{CE0} & C _{re}	U _{CE} U _{CEB} & U _{CE0}
min. typ. max.	MHz	dB	mA	V	MHz	ns	ns	max. V	mA	mA	max. μA	V	°C	pF	V
40	10		10	20		<1,4μ									
											0,06				
\$125...500	300		2	5				0,2	10	0,5	15	20	150	3,5	10
			2	5	1kHz			0,6	100	5	15n ²	S _{max}	25	58	80,5
\$125...260			2	5							4 ²	S _{max}	125		
\$240...500			2	5											
\$125...900			2	5											
\$125...260			2	5											
\$240...500			2	5											
\$450...900			2	5											
\$125...900			2	5	1kHz										
			1,2 < 4	0,2	5										
30 90			2	5											
	100		10	5				0,6	50		0,1	80	25	<5	10
95...650			<6	0,2	0,5						10	80	100	\$10	80,5
	>80										0,1				
80...550			<4	0,2	0,5	30Hz									
	150		2	5	15kHz			0,3	10		0,01				
80...200			0,2	0,5											
140...350			0,2	0,5											
280...550			0,2	0,5											
200...1000	100		1	5	1kHz			0,35	1		50n ²	\$20	25	2,7	5
			2,5	0,01	5						5 ²	\$20	65		
			<3	0,01	5	1kHz									
100...400	80		10	10											
\$170			10	10				1	100		0,1	20	25	12	10
40...120			150	10				0,25	50		50n	20	25	6	10
80...240	200		30	10				0,4	150		10	20	75		
			150	10											
30 50			30	10				2	50		0,1	75	25	6	10
	>60										80,1	84	25		

1) I_{CE0} 2) I_{CEB} 3) I_{CEV} 4) I_{CEX}

BC 530 BC 551					GRENZDATEN							
Typ Type Tipo	Hersteller Manufact. Fabricants Produttori	M/Pol M/Pol M/Pol	Bild Fig. Fig. Fig.	Anwendung Application Application Applicazione	U _{CE0} U _{CE0} U _{CE0} U _{CE0}	U _{CE1} U _{CE1} U _{CE1} U _{CE1}	U _{CE2} U _{CE2} U _{CE2} U _{CE2}	I _C I _{CM} I _B I _{BM}	P _{tot} W	T _U T _G T _K	R _{thU} °C/W	T _J °C
					max. V	max. V	max. V	max. mA	max. W	°C	°C/W	max. °C
BC 530	Fch	Si-P	D9/e	Vid kompl.: BC 532	130	120	6	100	0,625	25		150
BC 531	Fch	Si-P	D9/e	=BC 530: kompl.: BC 533	160	150						
BC 532	Fch	Si-N	D9/e	Vid kompl.: BC 530	160	140	6	100	0,625	25		150
BC 533	Fch	Si-N	D9/e	=BC 532: kompl.: BC 531	180	160						
BC 534	Fch	Si-P	D9/e	NF-Tr/E kompl.: BC 535	80	80	6	500	0,625	25		180
BC 535	Fch	Si-N	D9/e	NF-Tr/E kompl.: BC 534	80	80	6	500	0,625	25		150
BC 537	Fch, Mic	Si-N	D9/e	NF-Tr/E kompl.: BC 527	60	80	6	1A \$1,5A	0,625 1,5	25 525	200 583	180
BC 537-6 BC 537-10 BC 537-16 BC 537-25 BC 538 (-6...-25)	Fch, Mic	Si-N	D9/e	=BC 537: kompl.: BC 528	80	80						
BC 546	Aeg, Irt, Mot, Mul, Phi, Rtc, Sie, Tix, Val	Si-N	D11/a	Uni kompl.: BC 556	80	65 &80	6	100 \$200 &50	0,5	25	250 \$150	150
BC 546VI BC 546A BC 546B BC 547	=BC 546:	Si-N	D11/a	kompl.: BC 557	50	45 &50						
BC 547VI BC 547A BC 547B BC 547C	=BC 546:	Si-N	D11/a	kompl.: BC 558	30	30 &30	6					
BC 548 (VI...C)	=BC 546:	Si-N	D11/a	ra kompl.: BC 559	30	30 &30	5					
BC 549 (B...C)	=BC 546:	Si-N	D11/a	ra kompl.: BC 560	50	45 &50	5					
BC 550 (B...C)												
BC 551	Mul	Si-P	D11/a	Uni	50	45		100	0,5	25		150

KENNDATEN															
B (h _{FE}) β (h _{FE}) &U _{BE}	f _T MHz	F dB	I _C mA	U _{CE} V	f MHz	t _{on} ns	t _{off} ns	U _{CE} sat	I _C	I _B	I _{CE0}	U _{CE}	T _U	C _{CE0}	U _{CE}
min. typ. max.	&mV							max. V	mA	mA	max. μA	V	°C	pF	V
40.....180	>50		10	5				0,2	10		0,1			<6	10
60.....240	<8	0,25	5	5											
60.....250	>50		10	5				0,15	10		0,1			<6	10
40.....250	<10	0,25	5	5											
50	>50		100	1				0,25	100	10	0,1			<6,5	10
50	>50		100	1				0,25	100	10	0,1			<6	10
40.....400	>100		100	1				1,2	1A	100	0,1	40	25	<15	10
40.....100			100	1											
63.....160			100	1											
100.....250			100	1											
160.....400			100	1				1,5	1A	100	0,1	80	25		
575.....500	300	2<10	0,2	5	1kHz			0,25	10	0,5	15n	30	25	2,5	10
575.....150			2	5				0,6	100	5	5	30	150	59	&0,5
\$125.....260			2	5											
\$240.....500			2	5											
\$75.....900			2	5											
575.....150			2	5											
\$125.....260			2	5											
\$240.....500			2	5											
\$450.....900			2	5											
\$75.....900			2	5											
\$240.....900			2	5											
\$240.....900		1,2<4	0,2	5	1kHz										
\$240.....900			2	5											
\$240.....900		1<4	0,2	5	1kHz										
140			2												

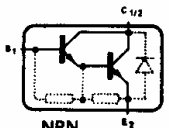
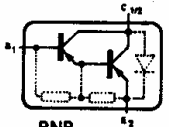
¹⁾ I_{CE0} ²⁾ I_{CE1} ³⁾ I_{CE2} ⁴⁾ I_{CEX}

BC 556 BC 618					GRENZDATEN							
Typ Type Tipo	Hersteller Manufact. Produttori	M/Pol M/Pol M/Pol	Bild Fig. Fig. Pin-Code	Anwendung Application Applicazione	U _{CB0} U _{CB0}	U _{CE0} U _{CE0} U _{CEV}	U _{EB0} U _{EB0}	I _C I _{CM} I _B I _{BM}	P _{tot} P _{tot}	T _U T _G T _K	R _{thU} R _{thU}	T _J T _J
					max. V	max. V	max. V	max. mA	max. W	°C	°C/W	max. °C
BC 556 BC 556VI BC 556A BC 556B BC 557	Aeg, Itt, Mot, Muj, Phi, Rtc Sie, Tix, Val	SI-P	D11/a	Uni kompl.: BC 546	80	65 80	5	100 5200 &50	0,5	25	250 150	150
BC 557VI BC 557A BC 557B BC 557C BC 558 (VI...C) BC 559 (A...C) BC 560 (A...C)	-BC 556: -BC 556: -BC 556: -BC 556:	SI-P	D11/a	kompl.: BC 547	50	45 &50						
		SI-P	D11/a	kompl.: BC 548	30	30 &30						
		SI-P	D11/a	ra kompl.: BC 549	30	30 &30						
		SI-P	D11/a	ra kompl.: BC 550	50	45 &50						
BC 582 BC 582A BC 582B BC 583	Tix Tix	SI-N	D12/a	Uni kompl.: BC 512	50	45	6	200	0,3	25	410	
BC 583A BC 583B BC 583C BC 584 (B...C)	Tix	SI-N	D12/a	-BC 582: kompl.: BC 513	30	20	5					
		SI-N	D12/a	-BC 582: ra kompl.: BC 514	30	20	5					
BC 585 BC 586	Mot Mot	SI-N SI-P	D9/a	Uni	25	20	5	100	0,35	25		150
BC 587	Ely	SI-P	A39/a		60		5	1A	4	125		
BC 612 BC 612L	Tix	SI-P	D12/a D9/c	Uni kompl.: BC 682	75	70	5	200	0,3	25		
BC 617 BC 618	Sie, Tix Sie, Tix	SI-N SI-N	D11/a	Darl, NF/Tr -BC 617:	50	40	12	1A &100	0,625 1,25	25 25	200 590	150

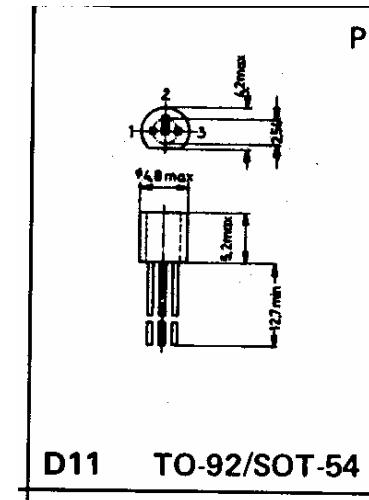
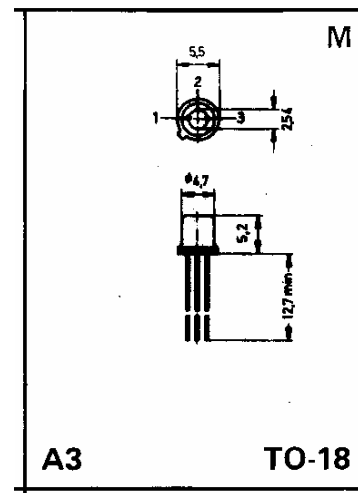
KENNDATEN															
B (h _{FE}) β (h _{FE}) &U _{BE}	f _T f _α &f _{max}	F S _{V_p} &ΔV _D F _c	I _C I _E	U _{CE} U _{CB} &U _{agc}	f	t _{on} t _d &t _r	t _{off} t _s &t _r	U _{CE} U _{BE} sat	I _C	I _B	I _{CE0} &I _{EB0}	U _{CE} U _{BE} &U _{EB}	T _U T _G &T _J	C _{CB0} C _{CE0} &C _{re} *C _{rb}	U _{CB} U _{CE} &U _{EB}
min.typ.max. &mV	MHz	dB	mA	V	MHz	ns	ns	max. V	mA	mA	max. μA	V	°C	pF	V
\$75.....500	150		2 10	5 5				0,3 0,65	10 100	0,5 5	15n 5	30 30	25 150	4,5	10
\$75.....150		2<10	0,2	5	1kHz										
\$125.....260			2	5											
\$240.....500			2	5											
\$75.....900			2	5											
\$75.....150			2	5											
\$125.....260			2	5											
\$240.....500			2	5											
\$450.....900			2	5											
\$75.....900			2	5											
\$125.....900			2	5											
\$125.....900		1<4	0,2	5	1kHz										
\$125.....900		1<4	0,2	5	1kHz										
100.....480		>150	2	5				0,6	100	5	15n			<5	10
100.....240		<10	0,2	5	1kHz										
200.....480			2	5											
100.....850			2	5											
100.....240			2	5											
200.....480			2	5											
400.....850			2	5											
200.....850		<4	0,2	5	1kHz										
120.....320			0,5	5				0,69	0,5						
120.....320			0,5	5				0,69	0,5						
60.....300		>200	2	5				0,72	2		15n			<10	10
10000 4000		>180	1A 500 1A	5 5 5				1,1	200	0,2	0,05 &0,05	40 &10	25 25	<4,5 &5	10 &5

1) I_{CER} 2) I_{CES} 3) I_{CEV} 4) I_{CEx}

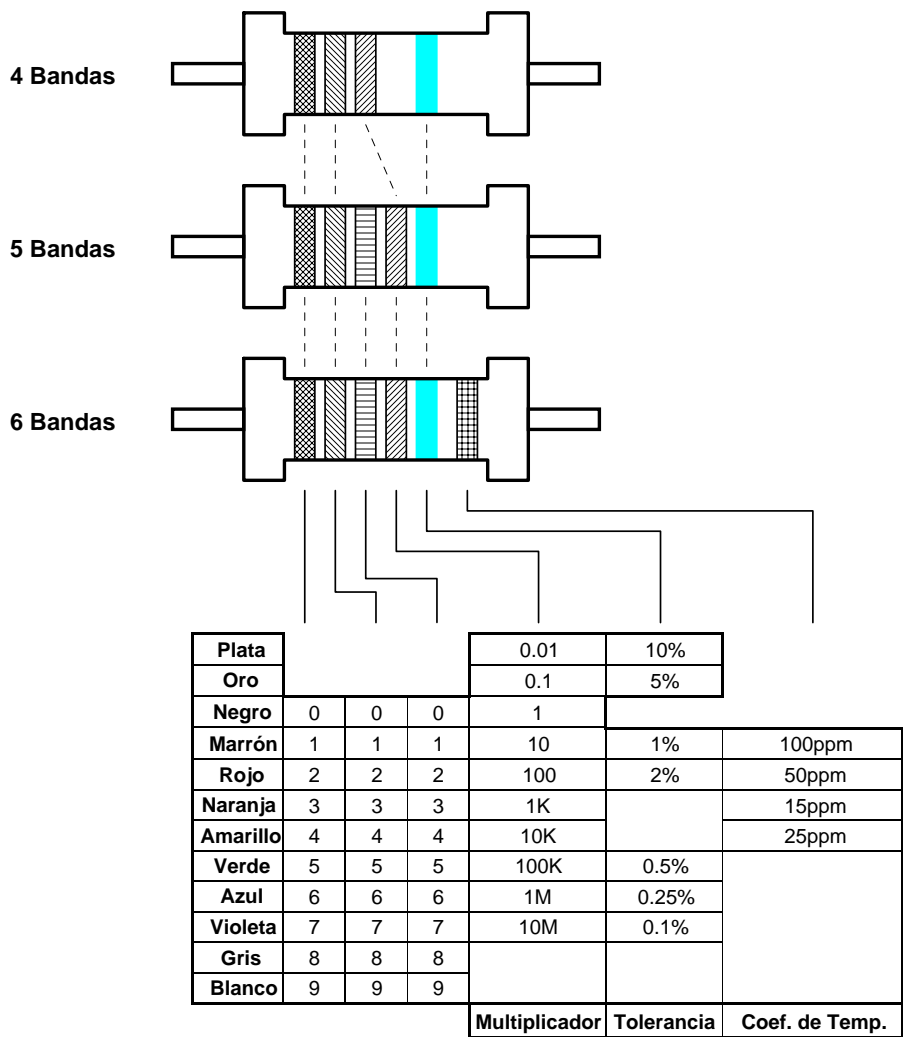
PIN-CODE

	Transistor				Darlington				FET				
	1	2	3	4	1	2	3	4	1	2	3	4	
a	E	B	C		E2	B1	C1/2		S	G	D		a
b	E	C	B		E2	C1/2	B1		S	D	G		b
c	B	C	E		B1	C1/2	E2		G	D	S		c
d	B	E	C						G	S	D		d
e	C	B	E		C1/2	B1	E2		D	G	S		e
f	C	E	B						D	S	G		f
g	E	B	C	Geh	E2	B1	C1/2	Geh	S	G	D	Sub	g
h	E	C	B	Geh	E2	C1/2	B1	Geh	S	D	G	Sub	h
j	B	C	E	Geh	B1	C1/2	E2	Geh	G	D	S	Sub	j
k	B	E	C	Geh									k
l	C	B	E	Geh					D	G	S	Sub	l
m	C	B	E	C					D	S	G	Sub	m
n	E	B	Geh	C	C1	E1/B2	E2		D	G	Sub	S	n
o	E	C	Geh	B					D	S	Sub	G	o
p	C	Geh	E	B					G	Sub	S	D	p
q	C	C	E	B					S	D	G	G	q
r	E	C	E	B	E2	B1	C1/2	E1/B2	S	G1	D	G2	r
s	E	B	E	C	E2	B1	E1/B2	C1/2	S	G1	G2	D	s
t	E	C	B	C	E2	E1/B2	B1	C1/2	D	G2	G1	S/Sub	t
u	E	B	C	B					G1	G2	D	S/Sub	u
v	B	C	B	E					S	D	G2	G1	v
w	B	E	B	C					G1	G2	S	D	w
x	E	B	C	E					D	S	G1	G2	x
y	E1	B	E2	C					S	G	S	D	y
z	E1	B	C	E2									z
za	B	E	C	E									za
zb	E/K	C	A	B									zb
§	C + Geh/case/boîte/invol.								D + Geh/case/boîte/invol.				§
&	B + Geh/case/boîte/invol.				NPN				G + Geh/case/boîte/invol.				&
+	E + Geh/case/boîte/invol.								S + Geh/case/boîte/invol.				+
=					PNP				Sub + Geh/case/boîte/invol.				=
	Geh = Gehäuse/case/ boîtier/involucro								Sub = Substrat/bulk/ substrat/sostrato				

dat 1...4 8/81



ANEXO 4: CÓDIGO DE COLORES DE RESISTENCIAS Y CONDENSADORES



Código de tolerancia en los condensadores cerámicos o de film plástico.

Letra	C	D	F	G	J	K	Y	M
Tolerancia	±0.25pF	±0.5pF	±1%	±2%	±5%	±10%	±15%	±20%
Letra	Q	T	U	S	Z			
Tolerancia	-10% +30%	-10% +50%	-10% +75%	-20% +50%	-20% +80%			

Tipo de dieléctrico utilizado.

MKC = Metallised Polycarbonate	MKT = Metallised Polyester	MKP = Metallised Polypropylene
KP = Polypropylene Film/foil	KS = Polystyrene Film/foil	KT = Polyester Film/foil

Coeficientes térmicos de los dieléctricos de los condensadores.

Color	Verde	Amarillo	Rojo/violeta	Negro	Marrón	Violeta	Marrón/rojo
Coeficiente	High K	Medium K	+100ppm/°C	Zero TC	-150ppm/°C	-750ppm/°C	-1500ppm/°C

ANEXO 5: TABLA DE DATOS DEL FET BF245

N-CHANNEL SILICON FIELD-EFFECT TRANSISTORS

General purpose symmetrical N-channel planar epitaxial junction field-effect transistors in a plastic TO-92 variant; intended for applications in l.f. and d.c. amplifiers, and in h.f. amplifiers.

QUICK REFERENCE DATA

Drain-source voltage	$\pm V_{DS}$	max.	30 V
Gate-source voltage (open drain)	$-V_{GSO}$	max.	30 V
Total power dissipation up to $T_{amb} = 75\text{ }^{\circ}\text{C}$	P_{tot}	max.	300 mW
Drain current $V_{DS} = 15\text{ V}; V_{GS} = 0$	I_{DSS}	BF245A/0	
		> 0,5	2,0 6 12 mA
	< 2,1	6,5 15 25 mA	
Gate-source cut-off voltage $I_D = 10\text{ nA}; V_{DS} = 15\text{ V}$	$-V_{(P)GS}$		0,25 to 8,0 V
Feedback capacitance at $f = 1\text{ MHz}$ $V_{DS} = 20\text{ V}; -V_{GS} = 1\text{ V}; T_{amb} = 25\text{ }^{\circ}\text{C}$	C_{rs}	typ.	1,1 pF
Transfer admittance (common source) $V_{DS} = 15\text{ V}; V_{GS} = 0; f = 1\text{ kHz}; T_{amb} = 25\text{ }^{\circ}\text{C}$	$ Y_{fs} $		3,0 to 6,5 mS

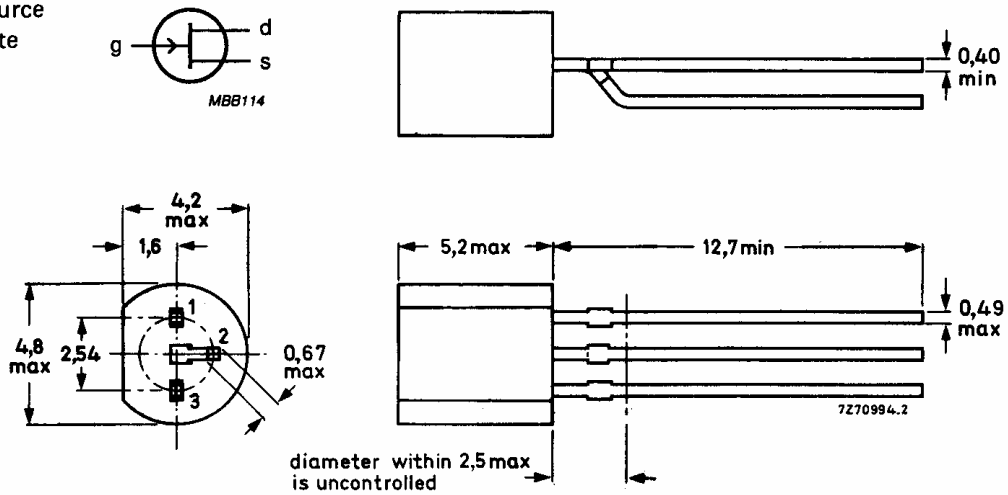
MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-92 variant.

Pinning:

- 1 = drain
- 2 = source
- 3 = gate



RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Drain-source voltage	$\pm V_{DS}$	max.	30 V
Drain-gate voltage (open source)	V_{DGO}	max.	30 V
Gate-source voltage (open drain)	$-V_{GSO}$	max.	30 V
Drain current	I_D	max.	25 mA
Gate current	I_G	max.	10 mA
Power dissipation			
up to $T_{amb} = 75\text{ }^\circ\text{C}$	P_{tot}	max.	300 mW
up to $T_{amb} = 90\text{ }^\circ\text{C}$	P_{tot}	max.	300 mW 1)
Storage temperature	T_{stg}		-65 to $+150\text{ }^\circ\text{C}$
Junction temperature	T_j	max.	$150\text{ }^\circ\text{C}$

THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j-a}$	=	250 K/W
From junction to ambient	$R_{th\ j-a}$	=	200 K/W

CHARACTERISTICS

$T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

		BF245A	B	C
Gate cut-off current				
$-V_{GS} = 20\text{ V}; V_{DS} = 0$	$-I_{GSS}$	< 5	5	5 nA
$-V_{GS} = 20\text{ V}; V_{DS} = 0; T_j = 125\text{ }^\circ\text{C}$	$-I_{GSS}$	< 0,5	0,5	0,5 μA
Drain current 2)				
$V_{DS} = 15\text{ V}; V_{GS} = 0$	$I_{DSS\ 3)}$	> 2 < 6,5	6,0 15,0	12 mA 25 mA
Gate-source breakdown voltage				
$-I_G = 1\text{ }\mu\text{A}; V_{DS} = 0$	$-V_{(BR)GSS}$	> 30	30	30 V
Gate-source voltage				
$I_D = 200\text{ }\mu\text{A}; V_{DS} = 15\text{ V}$	$-V_{GS\ 3)}$	> 0,4 < 2,2	1,6 3,8	3,2 V 7,5 V

1) Transistor mounted on printed-circuit board, maximum lead length 3 mm, mounting pad for drain lead minimum 10 mm x 10 mm.

2) Measured under pulse conditions: $t_p = 300\text{ }\mu\text{s}; \delta \leq 0,02$.

3) BF245A/0: $I_{DSS} = 0,5$ to $2,1\text{ mA}; -V_{GS} = 0,2$ to $1,0\text{ V}$
 BF245A/1: $I_{DSS} = 1,9$ to $3,0\text{ mA}; -V_{GS} = 0,4$ to $1,0\text{ V}$
 BF245A/2: $I_{DSS} = 3,0$ to $4,5\text{ mA}; -V_{GS} = 0,7$ to $1,4\text{ V}$
 BF245A/3: $I_{DSS} = 4,5$ to $6,5\text{ mA}; -V_{GS} = 1,1$ to $2,2\text{ V}$.

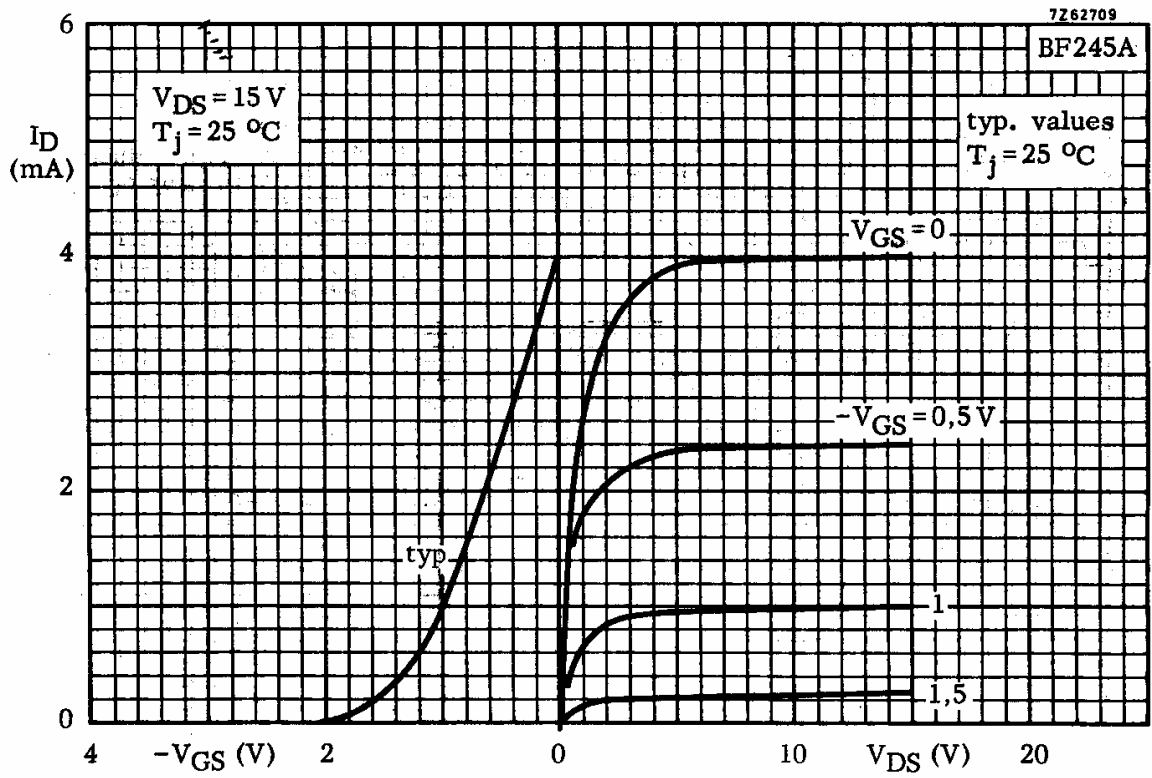


Fig. 3

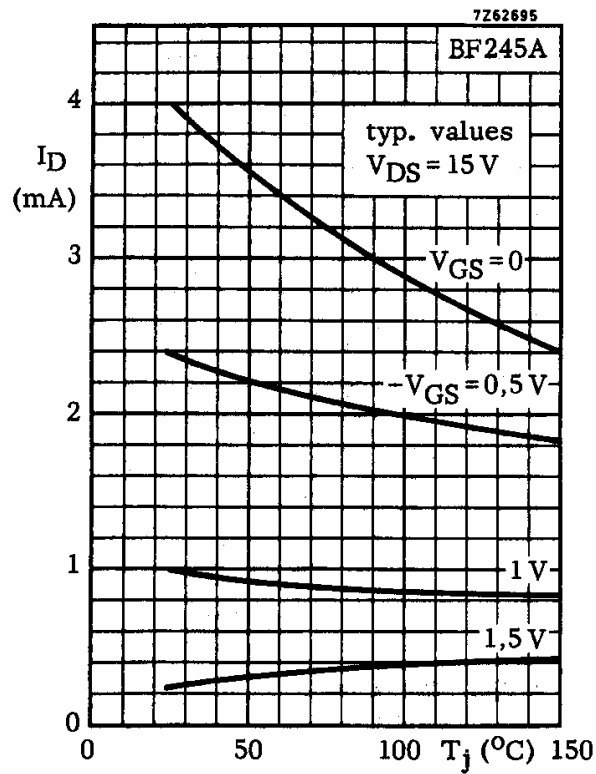


Fig. 4

ANEXO 6: TABLA DE DATOS DEL MOSFET IRF510

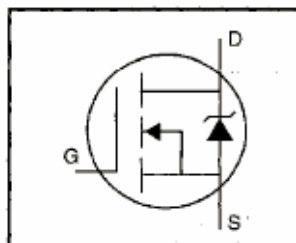


PD - 95364

IRF510PbF

HEXFET® Power MOSFET

- Dynamic dv/dt Rating
- Repetitive Avalanche Rated
- 175°C Operating Temperature
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements
- Lead-Free

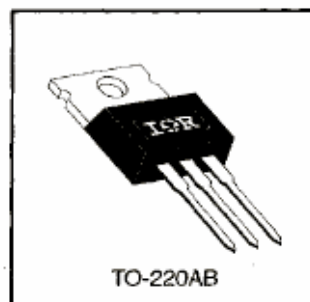


$V_{DSS} = 100V$
$R_{DS(on)} = 0.54\Omega$
$I_D = 5.6A$

Description

Third Generation HEXFETs from International Rectifier provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The TO-220 package is universally preferred for all commercial-industrial applications at power dissipation levels to approximately 50 watts. The low thermal resistance and low package cost of the TO-220 contribute to its wide acceptance throughout the industry.



Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10 V$	5.6	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10 V$	4.0	
I_{DM}	Pulsed Drain Current ①	20	
$P_D @ T_C = 25^\circ C$	Power Dissipation	43	W
	Linear Derating Factor	0.29	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy ②	100	mJ
I_{AR}	Avalanche Current ①	5.6	A
E_{AR}	Repetitive Avalanche Energy ①	4.3	mJ
dv/dt	Peak Diode Recovery dv/dt ③	5.5	V/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	°C
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	
	Mounting Torque, 6-32 or M3 screw	10 lbf•in (1.1 N•m)	

Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	—	3.5	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	—	0.50	—	
$R_{\theta JA}$	Junction-to-Ambient	—	—	62	

IRF510PbF



Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	100	—	—	V	V _{GS} =0V, I _D = 250μA
ΔV _{(BR)DSS/ΔT_J}	Breakdown Voltage Temp. Coefficient	—	0.12	—	V/°C	Reference to 25°C, I _D = 1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance	—	—	0.54	Ω	V _{GS} =10V, I _D =3.4A ③
V _{GS(th)}	Gate Threshold Voltage	2.0	—	4.0	V	V _{DS} =V _{GS} , I _D = 250μA
g _{fs}	Forward Transconductance	1.3	—	—	S	V _{DS} =50V, I _D =3.4A ③
I _{DSS}	Drain-to-Source Leakage Current	—	—	25	μA	V _{DS} =100V, V _{GS} =0V
		—	—	250		V _{DS} =80V, V _{GS} =0V, T _J =150°C
I _{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V _{GS} =20V
	Gate-to-Source Reverse Leakage	—	—	-100		V _{GS} =-20V
Q _g	Total Gate Charge	—	—	8.3	nC	I _D =5.6A
Q _{gs}	Gate-to-Source Charge	—	—	2.3		V _{DS} =80V
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	—	3.8		V _{GS} =10V See Fig. 6 and 13 ④
t _{d(on)}	Turn-On Delay Time	—	6.9	—		ns
t _r	Rise Time	—	16	—	I _D =5.6A	
t _{d(off)}	Turn-Off Delay Time	—	15	—	R _G =24Ω	
t _f	Fall Time	—	9.4	—	R _D =8.4Ω See Figure 10 ④	
L _D	Internal Drain Inductance	—	4.5	—	nH	Between lead, 6 mm (0.25in.) from package and center of die contact
L _S	Internal Source Inductance	—	7.5	—		
C _{iss}	Input Capacitance	—	180	—	pF	V _{GS} =0V
C _{oss}	Output Capacitance	—	81	—		V _{DS} =25V
C _{rss}	Reverse Transfer Capacitance	—	15	—		f=1.0MHz See Figure 5



Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I _S	Continuous Source Current (Body Diode)	—	—	5.6	A	MOSFET symbol showing the integral reverse p-n junction diode.
I _{SM}	Pulsed Source Current (Body Diode) ①	—	—	20		
V _{SD}	Diode Forward Voltage	—	—	2.5	V	T _J =25°C, I _S =5.6A, V _{GS} =0V ④
t _{rr}	Reverse Recovery Time	—	100	200	ns	T _J =25°C, I _F =5.6A
Q _{rr}	Reverse Recovery Charge	—	0.44	0.88	μC	di/dt=100A/μs ④
t _{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L _S +L _D)				

Notes:

① Repetitive rating; pulse width limited by max. junction temperature (See Figure 11)

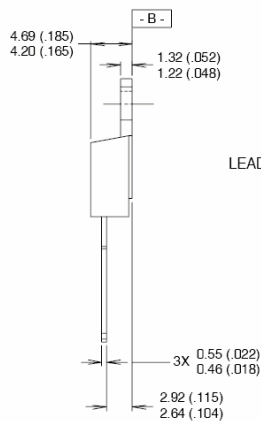
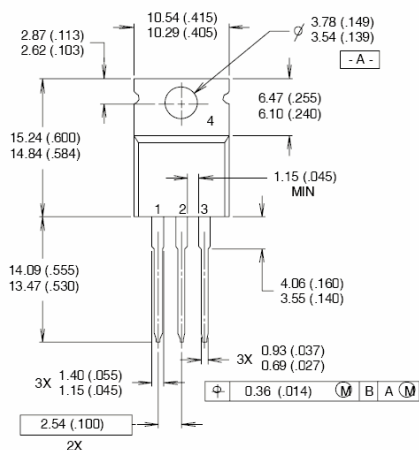
② V_{DD}=25V, starting T_J=25°C, L=4.8mH R_G=25Ω, I_{AS}=5.6A (See Figure 12)

③ I_{SD}≤5.6A, di/dt≤75A/μs, V_{DD}≤V_{(BR)DSS}, T_J≤175°C

④ Pulse width ≤ 300 μs; duty cycle ≤2%.

TO-220AB Package Outline

Dimensions are shown in millimeters (inches)



LEAD ASSIGNMENTS

HEXFET

- 1- GATE
- 2- DRAIN
- 3- SOURCE
- 4- DRAIN

NOTES:

- 1 DIMENSIONING & TOLERANCING PER ANSI Y14.5M, 1982.
- 2 CONTROLLING DIMENSION : INCH

- 3 OUTLINE CONFORMS TO JEDEC OUTLINE TO-220AB.
- 4 HEATSINK & LEAD MEASUREMENTS DO NOT INCLUDE BURRS.

ANEXO 7: LISTADO DE COMPONENTES

Ref.	Concepto	Cantidad
	Resistencia 1/4w, 100Ω	1
	Resistencia 1/4w, 150Ω	1
	Resistencia 1/4w, 220Ω	1
	Resistencia 1/4w, 390Ω	1
	Resistencia 1/4w, 470Ω	1
	Resistencia 1/4w, 1KΩ	1
	Resistencia 1/4w, 2K2Ω	1
	Resistencia 1/4w, 4K7Ω	1
	Resistencia 1/4w, 6K8Ω	1
	Resistencia 1/4w, 10KΩ	1
	Resistencia 1/4w, 180KΩ	1
	Resistencia 1/4w, 470KΩ	1
	Resistencia 1/4w, 1MΩ	1
	Condensador cerámico, 1nF 32V	1
	Condensador cerámico, 10nF 32V	1
	Condensador electrolítico, 33μF 16V	1
	Condensador electrolítico, 470μF 16V	1
	Diodo rectificador de Silicio, 1N4007	4
	Diodo Zener, 6.2V, 1/2w	1
	Diodo LED rojo, 5mm	1
	Transistor Bipolar NPN, BC547	2
	Transistor Bipolar PNP, BC557	1
	Transistor FET canal N, BF245	1
	Transistor MOSFET canal N, IRF510	1