

APPLICATION NOTES: (A) GENERAL PURPOSE (B) LOW NOISE AMP (C) SWITCH/CHOPPER (D) VHF/UHF AMP (E) LOW LEAKAGE AMP

TEST PARAMETER					V _{GSS}	I _{GSS}	V _{GS(OFF)}		V _{GS(ON)}		I _{DSS}		Q _M	C _{ISS}	C _{RSS}	R _{DS}	E _N	T _(OFF)	APPLICATION NOTES		
UNITS					(V)	(nA)	(V)		(V)		(mA)		(mS)	(pF)	(pF)	(Ω)	nV/Hz ^{1/2}	(ns)			
DEVICE TYPE	SOT 23 DESIGNATION	POLARITY	MARKING	PROCESS	TEST CONDITIONS AND LIMITS																
					MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MAX.	MAX.	MAX.	TYP.		
J308	TMPFJ308	N	6C1	NJ99	I _G =1μA -25	V _{GS} =-15V 1.0	V _{DS} =10, I _D =1nA -1.0 -6.5				V _{DS} =10V 12 60		V _{DS} =10, V _{GS} =0 8.0		V _{GS} =-10V 7.5	V _{GS} =-10V 2.5				D	
J309	TMPFJ309	N	6C2	NJ99	I _G =1μA -25	V _{GS} =-15V 1.0	V _{DS} =10, I _D 1nA -1.0 -4.0				V _{DS} =10V 12 30		V _{DS} =10V, V _{GS} =0 10		V _{GS} =-10V 7.5	V _{GS} =-10V 2.5				D	
J310	TMPFJ310	N	6T	NJ99	I _G =1μA -25	V _{GS} =-15V 1.0	V _{DS} =10, I _D 1nA -2.0 -6.5				V _{DS} =10V 24 60		V _{DS} =10, V _{GS} =0 8.0		V _{GS} =-10V 7.5	V _{GS} =-10V 2.5				D	
U310	TMPFU310	N	6C	NJ99	I _G =1μA -25	V _{GS} =-15V 0.15	V _{DS} =10, I _D 1nA -2.5 -6.0				V _{DS} =10V 24 60		V _{DS} =10, V _{GS} =0 10		I _D =10mA 5.0	I _D =10mA 2.5				D	
2N3819	TMPF3819	N	6W	NJ32	I _G =1μA -25	V _{GS} =-15V 2.0	V _{DS} =15, I _D 2nA -8.0		V _{DS} =-15, I _D =200μA -0.5 -7.5		V _{DS} =15V 2 20		V _{DS} =15, V _{GS} =0 2.0 6.5		V _{DS} =15V 8.0	V _{DS} =15V 4.0				A	
2N3820	TMPF3820	P	6M	PJ32	I _G =10μA 20	V _{GS} =10 20	V _{DS} =-10, I _D =10μA 8.0		V _{DS} =-10, I _D 30μA 0.3 7.9		V _{DS} =-10V 0.3 15		V _{DS} =-10, V _{GS} =0 0.8 5		V _{DS} =-10 32	V _{DS} =-10 16				A	
2N3821	TMPF3821	N	6W1	NJ32	I _G =1μA -50	V _{GS} =-30 0.1	V _{DS} =15, I _D =0.5nA -4.0		V _{DS} =15, I _D =50μA -0.5 -2.0		V _{DS} =15V 0.5 2.5		V _{DS} =15, V _{GS} =0 1.5 4.5		V _{DS} =15 6.0	V _{DS} =15 3.0		f=10Hz 200		B	
2N3822	TMPF3822	N	6W2	NJ32	I _G =1μA -50	V _{GS} =-30 0.1	V _{DS} =15, I _D =0.5nA -6.0		V _{DS} =15, I _D =200μA -1.0 -4.0		V _{DS} =15V 2.0 10.0		V _{DS} =15, V _{GS} =0 3.0 6.5		V _{DS} =15 6.0	V _{DS} =15 3.0		f=10Hz 200		B	
2N3823	TMPF3823	N	6W3	NJ32	I _G =1μA -30	V _{GS} =-20 0.5	V _{DS} =15, I _D =0.5nA -8.0		V _{DS} =15, I _D =450μA -1.0 -7.5		V _{DS} =15V 4.0 20.0		V _{DS} =15, V _{GS} =0 3.5 6.5		V _{DS} =15 6.0	V _{DS} =15 2.0				D	
2N3824	TMPF3824	N	6W4	NJ32	I _G =1μA -50	V _{GS} =-30 0.1	V _{DS} =15, I _D =0.1nA -8.0				V _{DS} =15V 12.0 24.0				V _{DS} =15 6.0	V _{DS} =15 3.0	V _{GS} =0 250				C
2N3993	TMPF3993	P	6P	PJ99	I _G =1μA 25	V _{GS} =-15 1.2	V _{DS} =-10, I _D =1.2nA 10		V _{DS} =10, I _D =1μA 4 9.5		V _{DS} =-10V 10		V _{DS} =-10, V _{GS} =0 6 12		V _{DS} =-10 16	V _{GS} =10 4.5	V _{GS} =0 150				C
2N3994	TMPF3994	P	6P1	PJ99	I _G =1μA 25	V _{GS} =15 1.2	V _{DS} =-10, I _D =1.2nA 6.0		V _{DS} =10, I _D =1mA 1.0 5.5		V _{DS} =-10V 2		V _{DS} =-10, V _{GS} =0 4 10		V _{DS} =-10 16	V _{GS} =6V 5	V _{GS} =0 300				C
2N4091	TMPF4091	N	6N	NJ132	I _G =1μA -40	V _{GS} =-20 0.2	V _{DS} =20, I _D =1nA -5 -10		V _{DS} =0.2, I _D =6mA 0		V _{DS} =20V 30				V _{DS} =20 16	V _{GS} =-20 5	V _{GS} =0 30		V _{GS} =0 10		C
2N4092	TMPF4092	N	6N1	NJ132	I _G =1μA -40	V _{GS} =-20 0.2	V _{DS} =20, I _D =1nA -2 -7		V _{DS} =0.2, I _D =4mA 0 15						V _{DS} =20 16	V _{GS} =-20 5	V _{GS} =0 50		V _{GS} =0 18		C
2N4093	TMPF4093	N	6N2	NJ132	I _G =1μA -40	V _{GS} =-20 0.2	V _{DS} =20, I _D =1nA -1 -5		V _{DS} =0.2, I _D =2.5mA 0 8						V _{DS} =20 16	V _{GS} =-20 5	V _{GS} =0 80		V _{GS} =0 31		C
2N4117	TMPF4117	N	6R	NJ01	I _G =1μA -40	V _{GS} =-20 0.01	V _{DS} =10, I _D =1nA -0.6 -1.8				V _{DS} =10V 0.03 0.09		V _{DS} =10, V _{GS} =0 0.02 0.21		V _{DS} =10V 3.0	V _{DS} =10V 1.5					E
2N4118	TMPF4118	N	6R1	NJ01	I _G =1μA -40	V _{GS} =-20 0.01	V _{DS} =10, I _D =1nA 1.0 3.0				V _{DS} =10V 0.08 0.24		V _{DS} =10, V _{GS} =0 0.08 0.25		V _{DS} =10V 3.0	V _{DS} =10V 1.5					E
2N4119	TMPF4119	N	6R2	NJ01	I _G =1μA -40	V _{GS} =-20 0.01	V _{DS} =10, I _D =1nA 2.0 6.0				V _{DS} =10V 0.20 0.60		V _{DS} =10, V _{GS} =0 0.10 0.33		V _{DS} =10V 3.0	V _{DS} =10V 1.5					E
2N4338	TMPF4338	N	6S	NJ16	I _G =1μA -50	V _{GS} =-30 0.10	V _{DS} =15, I _D =0.1nA -0.3 -1.0				V _{DS} =15V 0.20 0.60		V _{DS} =15, V _{GS} =0 0.6 1.8		V _{DS} =15V 7.0	V _{DS} =15V 3.0		f=1kHz 68			A
2N4339	TMPF4339	N	6S1	NJ16	I _G =1μA -50	V _{GS} =-30 0.10	V _{DS} =15, I _D =0.1nA -0.6 -1.8				V _{DS} =15V 0.50 1.5		V _{DS} =15, V _{GS} =0 0.8 2.4		V _{DS} =15V 7.0	V _{DS} =15V 3.0		f=1kHz 68			A
2N4340	TMPF4340	N	6S2	NJ16	I _G =1μA -50	V _{GS} =-30 0.10	V _{DS} =15, I _D =0.1nA -1.0 -3.0				V _{DS} =15V 1.2 3.6		V _{DS} =15, V _{GS} =0 1.3 3.0		V _{DS} =15V 7.0	V _{DS} =15V 3.0		f=1kHz 68			A
2N4341	TMPF4341	N	6S3	NJ16	I _G =1μA -50	V _{GS} =-30 0.10	V _{DS} =15, I _D =0.1nA -2.0 -6.0				V _{DS} =15V 3.0 9.0		V _{DS} =15, V _{GS} =0 2.0 4.0		V _{DS} =15V 7.0	V _{DS} =15V 3.0		f=1kHz 68			A
2N4391	TMPF4391	N	6J	NJ132	I _G =1μA -40	V _{GS} =-20 0.10	V _{DS} =20, I _D =1nA -4.0 -10.0		V _{DS} =0.4, I _D =12mA 0		V _{DS} =20V 50 150				V _{DS} =20V 14	V _{GS} =-12V 3.5	V _{GS} =0 30		V _{GS} =-12V 10		C
2N4392	TMPF4392	N	6K	NJ132	I _G =1μA -40	V _{GS} =-20 0.10	V _{DS} =20, I _D =1nA -2.0 -5.0		V _{DS} =0.4, I _D =6mA 0		V _{DS} =20V 25 75				V _{DS} =20V 14	V _{GS} =-7V 3.5	V _{GS} =0 60		V _{GS} =-7V 18		C
2N4393	TMPF4393	N	6G	NJ132	I _G =1μA -40	V _{GS} =-20 0.10	V _{DS} =20, I _D =1nA -0.5 -3.0		V _{DS} =0.4, I _D =3mA 0		V _{DS} =20V 5 30				V _{DS} =20V 14	V _{GS} =-5V 3.5	V _{GS} =0 100		V _{GS} =-5V 31		C
2N4416	TMPF4416	N	6A	NJ26	I _G =1μA -30	V _{GS} =-20 0.10	V _{DS} =15, I _D =1nA -6.0		V _{DS} =15V, I _D =0.5mA -1.0 -5.5		V _{DS} =15V 5 15		V _{DS} =15, V _{GS} =0 4.5 7.5		V _{DS} =15V 4.0	V _{DS} =15V 0.8					D
2N4416A	TMPF4416A	N	6A2	NJ26	I _G =1μA -35	V _{GS} =-20 0.10	V _{DS} =15, I _D =1nA -2.5 -6.0		V _{DS} =15V, I _D =0.5mA -1.0 -5.5		V _{DS} =15V 5 15		V _{DS} =15, V _{GS} =0 4.5 7.5		V _{DS} =15V 4.0	V _{DS} =15V 0.8					D
2N4856	TMPF4856	N	6V	NJ132	I _G =1μA -40	V _{GS} =-20 0.25	V _{DS} =15, I _D =0.5nA -4.0 -10		V _{DS} =0.75V, I _D =20mA 0		V _{DS} =15V 50				V _{DS} =-10V 18	V _{GS} =-10V 8.0	V _{GS} =0 25		V _{GS} =-10V 10		C
2N4857	TMPF4857	N	6V1	NJ132	I _G =1μA -40	V _{GS} =-20 0.25	V _{DS} =15, I _D =0.5nA -2.0 -6.0		V _{DS} =0.5V, I _D =10mA 0		V _{DS} =15V 20 100				V _{DS} =-10V 18	V _{GS} =-10V 8.0	V _{GS} =0 40		V _{GS} =-6V 18		C
2N4858	TMPF4858	N	6V2	NJ132	I _G =1μA -40	V _{GS} =-20 0.25	V _{DS} =15, I _D =0.5nA -0.8 -4.0		V _{DS} =0.5V, I _D =5mA 0		V _{DS} =15V 8 80				V _{DS} =-10V 18	V _{GS} =-10V 8.0	V _{GS} =0 60		V _{GS} =-4V 31		C
2N4859	TMPF4859	N	6V3	NJ132	I _G =1μA -30	V _{GS} =-15 0.25	V _{DS} =15, I _D =0.5nA -4.0 -10		V _{DS} =0.5V, I _D =20mA 0		V _{DS} =15V 50				V _{DS} =-10V 18	V _{GS} =-10V 8.0	V _{GS} =0 25		V _{GS} =-10V 10		C

U.S. STANDARD (continued)

T-35-25

APPLICATION NOTES: (A) GENERAL PURPOSE (B) LOW NOISE AMP (C) SWITCH/CHOPPER (D) VHF/UHF AMP (E) LOW LEAKAGE AMP

TEST PARAMETER					V _{GS}	I _{GSS}	V _{GS(OFF)}	V _{GS(ON)}	I _{DSS}	G _M	C _{ISS}	C _{RSS}	R _{DS}	E _N	T _(OFF)	APPLICATION NOTES	
UNITS		POLARITY	MARKING	PROCESS	(V)	(nA)	(V)	(V)	(mA)	(mS)	(pF)	(pF)	(OHMS)	nV/Hz ^{1/2}	(ns)		
DEVICE TYPE	SOT 23 DESIGNATION				TEST CONDITIONS AND LIMITS												
					MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MAX.	MAX.		MAX.
2N4860	TMPF4860	N	6F	NJ132	I _G =1μA -30	V _{GS} =-15 0.25	V _{DS} =15, I _D =0.5nA -4.0 -10	V _{DS} =0.5V, I _D =10mA 0	V _{DS} =15V 50			V _{DS} =-10V 18	V _{DS} =-10V 8.0	V _{GS} =0 25		V _{GS} =-6V 10	C
2N4861	TMPF4861	N	6F1	NJ132	I _G =1μA -30	V _{GS} =-15 0.25	V _{DS} =15, I _D =0.5nA -0.8 -4.0	V _{DS} =0.5V, I _D =5mA 0	V _{DS} =15V 8 80			V _{DS} =-10V 18	V _{GS} =-10V 8.0	V _{GS} =0 60		V _{GS} =-4V 31	C
2N5114	TMPF5114	P	6P2	PJ99	I _G =1μA 30	V _{GS} =20V 0.50	V _{DS} =-15, I _D =1.0nA 5.0 10		V _{DS} =15V 30 90			V _{DS} =-15V 25	V _{GS} =-12V 7	V _{GS} =0 75		17	C
2N5115	TMPF5115	P	6P3	PJ99	I _G =1μA 30	V _{GS} =20V 0.50	V _{DS} =-15, I _D =1.0nA 3.0 6.0		V _{DS} =15V 16 60			V _{DS} =-15V 25	V _{GS} =-7V 7	V _{GS} =0 100		30	C
2N5116	TMPF5116	P	6P4	PJ99	I _G =1μA 30	V _{GS} =20V 0.50	V _{DS} =-15, I _D =1.0nA 1.0, 4.0		V _{DS} =15V 5 25			V _{DS} =-15V 25	V _{GS} =-5V 7	V _{GS} =0 150		48	C
2N5397	TMPF5397	N	6X	NJ26L	I _G =1μA -25	V _{GS} =-15V 0.10	V _{DS} =10, I _D =1.0nA -1.0 -6.0		V _{DS} =10V 10 30	V _{DS} =10V, I _D =10mA 6 10	I _D =10mA 5.0	I _D =10mA 1.2					D
2N5398	TMPF5398	N	6X1	NJ26L	I _G =1μA -25	V _{GS} =-15V 0.10	V _{DS} =10, I _D =1.0nA -1.0 -6.0		V _{DS} =10V 5 40	V _{DS} =10V, V _{GS} =0 5.5 10	V _{DS} =10V 5.5	V _{DS} =10V 1.3					D
2N5457	TMPF5457	N	6D	NJ32	I _G =1μA -25	V _{GS} =-15V 1.0	V _{DS} =10V, I _D =10nA -0.5 -6.0		V _{DS} =15V 1 5	V _{DS} =15V, V _{GS} =0 2.0 5.0	V _{DS} =15V 7.0	V _{DS} =15V 3.0					A
2N5458	TMPF5458	N	6D1	NJ32	I _G =1μA -25	V _{GS} =-15V 1.0	V _{DS} =15V, I _D =10nA -1.0 -7.0		V _{DS} =15V 2 9	V _{DS} =15V, V _{GS} =0 1.5 5.5	V _{DS} =15V 7.0	V _{DS} =15V 3.0					A
2N5459	TMPF5459	N	6L	NJ32	I _G =1μA -25	V _{GS} =-15V 1.0	V _{DS} =15V, I _D =10nA -2.0 -8.0		V _{DS} =15V 4 16	V _{DS} =15V, V _{GS} =0 2.0 6.0	V _{DS} =15V 7.0	V _{DS} =15V 3.0					A
2N5460	TMPF5460	P	6E	PJ32	I _G =10μA 40	V _{GS} =20V 5.0	V _{DS} =-15V, I _D =1nA .75 6.0	V _{DS} =-15, I _D =100mA 0.5 4.0	V _{DS} =-15V 1 5	V _{DS} =-15V, V _{GS} =0 1.0 4.0	V _{DS} =-15V 7.0	V _{DS} =-15V 2.0	V _{GS} =0 2000	f=100kHz 115			A
2N5461	TMPF5461	P	6E1	PJ32	I _G =10μA 40	V _{GS} =20V 5.0	V _{DS} =-15V, I _D =1nA 1.0 7.5	V _{DS} =-15, I _D =200mA 0.8 4.5	V _{DS} =-15V 2 9	V _{DS} =-15V, V _{GS} =0 1.5 5.0	V _{DS} =-15V 7.0	V _{DS} =-15V 2.0	V _{GS} =0 800	f=100kHz 115			A
2N5462	TMPF5462	P	6E2	PJ32	I _G =10μA 40	V _{GS} =20V 5.0	V _{DS} =-15V, I _D =1nA 1.8 9.0	V _{DS} =-15, I _D =400mA 1.5 6.0	V _{DS} =-15V 4 16	V _{DS} =-15V, V _{GS} =0 2.0 6.0	V _{DS} =-15V 7.0	V _{DS} =-15V 2.0	V _{GS} =0 400	f=100kHz 115			A
2N5484	TMPF5484	N	6B	NJ26	I _G =1μA -25	V _{GS} =-20V 1.0	V _{DS} =15V, I _D =10nA -3.0 -3.0		V _{DS} =15V 1.0 5.0	V _{DS} =15V, V _{GS} =0 3.0 6.0	V _{DS} =15V 5.0	V _{DS} =15V 1.0					D
2N5485	TMPF5485	N	6B1	NJ26	I _G =1μA -25	V _{GS} =-20V 1.0	V _{DS} =15V, I _D =10nA -4.0		V _{DS} =15V 4.0 10	V _{DS} =15V, V _{GS} =0 3.5 7.0	V _{DS} =15V 5.0	V _{DS} =15V 1.0					D
2N5486	TMPF5486	N	6H	NJ26	I _G =1μA -25	V _{GS} =-20V 1.0	V _{DS} =15V, I _D =10nA -2.0 -6.0		V _{DS} =15V 8.0 20	V _{DS} =15V, V _{GS} =0 4.0 8.0	V _{DS} =15V 5.0	V _{DS} =15V 1.0					D

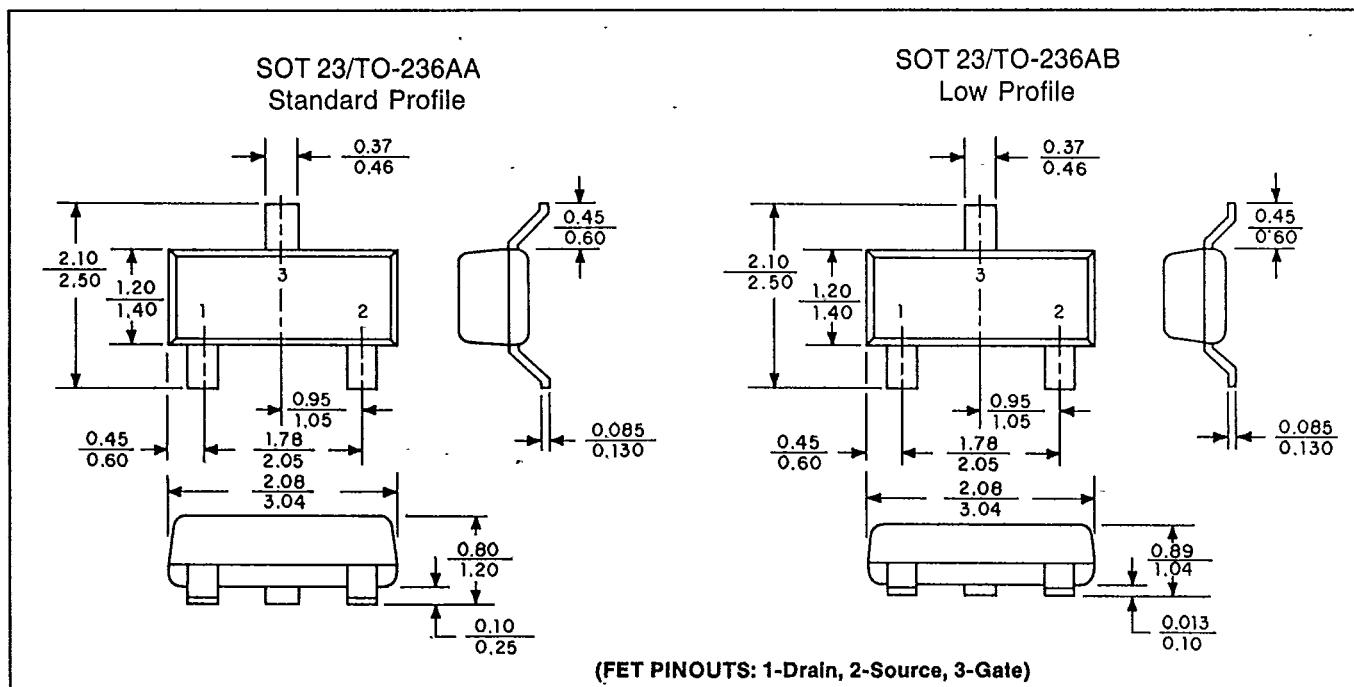
EUROPEAN STANDARD

APPLICATION NOTES: (A) GENERAL PURPOSE (B) LOW NOISE AMP (C) SWITCH/CHOPPER (D) VHF/UHF AMP (E) LOW LEAKAGE AMP

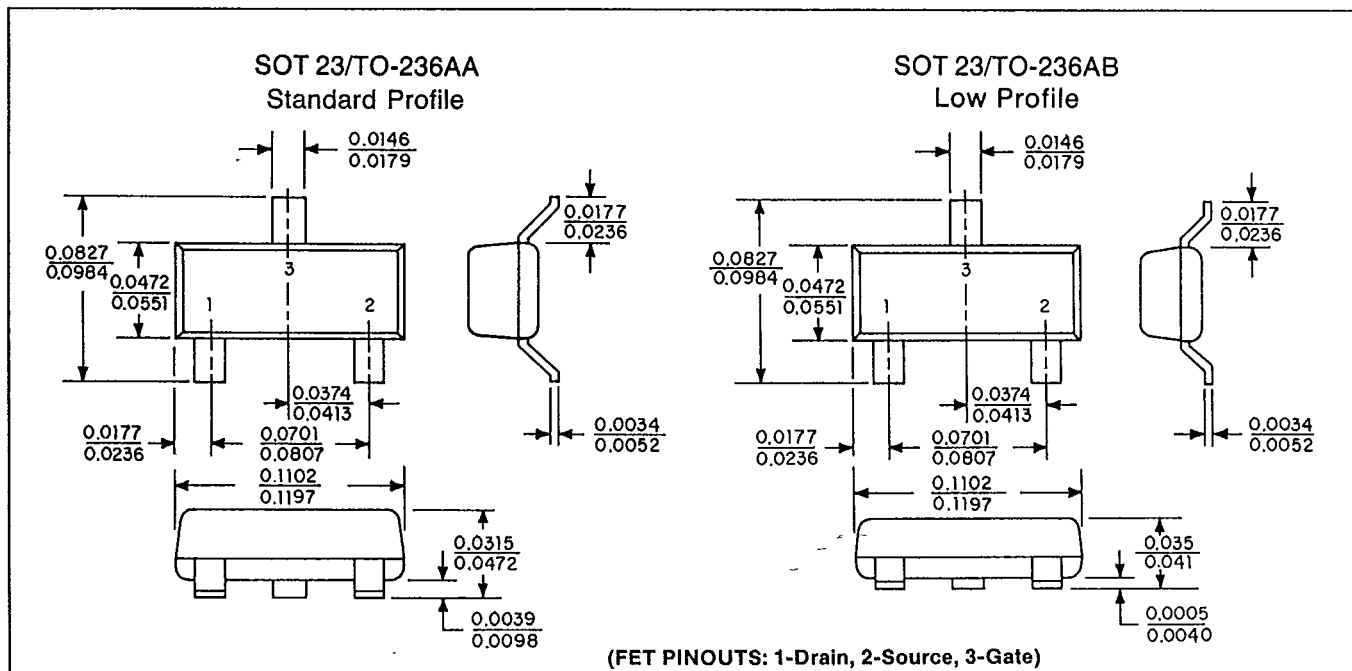
TEST PARAMETER					V _{GS}	I _{GSS}	V _{GS(OFF)}	V _{GS(ON)}	I _{DSS}	G _M	C _{ISS}	C _{RSS}	R _{DS}	E _N	T _(OFF)	APPLICATION NOTES
UNITS		POLARITY	MARKING	PROCESS	(V)	(nA)	(V)	(V)	(mA)	(mS)	(pF)	(pF)	(Ω)	nV/Hz ^{1/2}	(ns)	
DEVICE TYPE	SOT 23 DESIGNATION				TEST CONDITIONS AND LIMITS											
					MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MAX.	MAX.	
BC264	BC264SM	N	6Q	NJ26	I _G =1μA -30	V _{GS} =-20V 10	V _{DS} =15, I _D =10nA -0.5	V _{DS} =15, I _D =200mA -0.40	V _{DS} =15V 2 12	V _{DS} =15, V _{GS} =0 2.5	V _{GS} =-1V 4	V _{GS} =-1V 1.2		f=10Hz 40		B
BF244	BF244SM	N	6Q	NJ26	I _G =1μA -30	V _{GS} =-20V 5	V _{DS} =15 I _D 10nA -0.5 -8	V _{DS} =15, I _D =200mA -0.40 -7.5	V _{DS} =15V 2 25	V _{DS} =15, V _{GS} =0 3.0 6.5	V _{GS} =-1V 4	V _{GS} =-1V 1.1				D
BF246	BF246SM	N	6U	NJ99	I _G =1μA -25	V _{GS} =-15V 5nA	V _{DS} =15 I _D 10nA -0.6 -14.5	V _{DS} =15, I _D =200mA -0.5 -14	V _{DS} =15V 10 300	V _{DS} =15, V _{GS} =0 8.0	I _D =10mA 11	I _D =10mA 3.5				D
BF256	BF256SM	N	6Q2	NJ26	I _G =1μA -30	V _{GS} =-20V 5		V _{DS} =15, I _D =200mA -0.5 -7.5	V _{DS} =15V 3 18	V _{DS} =15, V _{GS} =0 4.5		V _{GS} =-1V 0.7				D
BF320	BF320SM	P	6M1	PJ32	I _G =10μA -15	V _{GS} =10V 20	V _{DS} =10 I _D 10nA 8.0	V _{DS} =10V, I _D =30mA 0.30 7.9	V _{DS} =-10V 0.30 15	V _{DS} =-10, V _{GS} =0 0.80 5.0	V _{DS} =-10V 32	V _{DS} =-10V 16				A
BFR30	BFR30	N	M1	NJ26	I _G =1μA -25	V _{GS} =-10V 0.2	V _{DS} =10 I _D 0.5nA -5		V _{DS} =10V 4 10	V _{DS} =10, V _{GS} =0 1.0 4.0						D
BFR31	BFR31	N	M2	NJ26	I _G =1μA -25	V _{GS} =-10V 0.2	V _{DS} =10 I _D 0.5nA -5		V _{DS} =10V 1 5	V _{DS} =10, V _{GS} =0 1.5 4.5						D
BFT10	BFT10SM	N	6U1	NJ99	I _G =1μA -40	V _{GS} =-20V 0.8	V _{DS} =10V I _D 1nA -7		V _{DS} =10V 10	V _{DS} =10, V _{GS} =0 6.0 20	V _{GS} =-10 4.0	V _{GS} =-10 1.5	V _{GS} =0 100			C
BFT11	BFT11SM	P	6P5	PJ99	I _G =1μA 25	V _{GS} =15V 10	V _{DS} =-10V I _D 1nA 4 9.5		V _{DS} =-10V 10	V _{DS} =-10, V _{GS} =0 6.0 15	V _{GS} =0 18	V _{GS} =6V 6.0	V _{GS} =0 150			C

DIMENSIONS

MILLIMETRES



INCHES*



*Based on 25.4 mm = 1 in.

In the construction of the components described, the full intent of the specification will be met. The Sprague Electric Company, however, reserves the right to make, from time to time, such departures from the detail specifications as may be required to permit improvements in the design of its products. Components made under military approvals will be in accordance with the approval requirements.

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