Field Effect Transistors

JFETs

JFETs operate in the depletion mode. They are available in both P- and N-channel and are offered in both Through-hole and Surface Mount Packages. Applications include general-purpose amplified, switches and choppers, and RF amplifiers and mixers. These devices are economical and very rugged. The drain and source are interchangeable on many typical FETs.

JFET Low-Frequency/Low-Noise (Case 29-04 — TO-226AA (TO-92) — N-Channel)
The following table is a listing of small-signal JFETs intended for low-noise applications in the audio range. These devices exhibit good linearity and are candidates for hi-fi and instrumentation equipment.

Mfr.'s Type	$R_e Y_{fs}$ @ f		$R_e Y_{os}$ @ f		C_{iss} (pF) Max.	C_{rss} (pF) Min.	$V_{(BR)GSS}$ $V_{(BR)GDO}$ (V) Min.	$V_{GS(off)}$ (V)		I_{DSS} (mA)		Style
	mmho Min.	(kHz)	µmho Max.	(kHz)				Min.	Max.	Min.	Max.	
2N5458	1.5	1.0	50	1.0	7.0	3.0	25	1.00	7.0	2.0	9.0	5
2N5457	1.0	1.0	50	1.0	7.0	3.0	25	0.50	6.0	1.0	5.0	5

JFET Low-Frequency/Low-Noise (Case 29-04 — TO-226AA (TO-92) — P-Channel)

2N5460	1.0	1.0	75	1.0	7.0	2.0	40	0.75	6.0	1.0	5.0	7
2N5461	1.5	1.0	75	1.0	7.0	2.0	40	1.00	7.5	2.0	9.0	7
2N5462	2.0	1.0	75	1.0	7.0	2.0	40	1.80	9.0	4.0	16.0	7

JFET High-Frequency Amplifiers (Case 29-04 — TO-226AA (TO-92) — N-Channel)
The following is a listing of small signal JFETs that are intended for hi-frequency applications. These are candidates for VHF/UHF oscillators, mixers and front-end amplifiers.

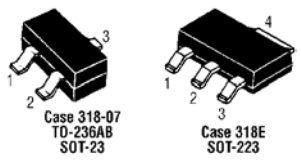
Mfr.'s Type	$R_e Y_{fs}$ @ f		$R_e Y_{os}$ @ f		C_{iss} (pF) Max.	C_{rss} (pF) Min.	$V_{(BR)GSS}$ $V_{(BR)GDO}$ (V) Min.	NF @ RG=1 K		$V_{GS(off)}$ (V)		I_{DSS} (mA)		Style
	mmho Min.	(MHz)	µmho Max.	(MHz)				dB Max.	f (MHz)	Min.	Max.	Min.	Max.	
2N5485	3.0	400	100	400	5.0	1.0	4.0	400	25	0.5	4.0	4.0	10.0	5
2N5486	3.5	400	100	400	5.0	1.0	4.0	400	25	2.0	6.0	8.0	20.0	5
J309	12[1]	100	250[1]	100	7.5	2.5	1.5[1]	100	25	1.0	4.0	12	30.0	5
J310	12[1]	100	250[1]	100	7.5	2.5	1.5[1]	100	25	2.0	6.5	24	60.0	5

[1]Typical.

Field Effect Transistors

Surface Mount FETs

This section contains the FET plastic packages available for surface mount applications. Most of these devices are the most popular metal-can and insertion type parts carried over to the new surface mount packages.



Surface Mount RF JFETs
Pinout: 1 — Drain, 2 — Source, 3 — Gate (Case 318-07 — TO-236AB (SOT-23) — N-Channel)
The following is a list of surface mount FETs which are intended for VHF/UHF RF amplifier applications.

Mfr.'s Type	Marking	NF		Y_{fs} @ V_{DS}			$V_{(BR)GSS}$	Style
		dB Typ.	f (MHz)	mmhos Min.	mmhos Max.	(V)		
MMBFJ309LT1	6U	1.5	450	10.0	20.0	10	25	10
MMBFJ310LT1	6T	1.5	450	8.0	18.0	10	25	10
MMBFU310LT1	M6C	1.5	450	10.0	18.0	10	25	10
MMBF4416LT1	M6A	2.0[1]	100	4.5	7.5	15	30	10

[1]Max.

Surface Mount General-Purpose JFETs
Pinout: 1 — Drain, 2 — Source, 3 — Gate (Case 318-07 — TO-236AB (SOT-23)) — P-Channel
The following table is a listing of surface mount small-signal general purpose FETs. These devices are intended for small-signal amplification for DC, audio. and lower RF frequencies. They also have applications as oscillators and general-purpose, low-voltage switches.

Mfr.'s Type	Marking	$V_{(BR)GSS}$	Yfs @ V_{DS}			I_{DSS}		Style
			mmhos Min.	mmhos Max.	(V)	(mA) Min.	(mA) Max.	
MMBF5460LT1	M6E	40	1.0	4.0	15	1.0	5.0	10

Surface Mount Choppers/Switches JFETs
Pinout: 1 — Drain, 2 — Source, 3 — Gate (Case 318-07 — TO-236AB (SOT-23)) —N-Channel
The following is a listing of small-signal surface mount JFET devices intended for switching and chopper applications.

Mfr.'s Type	Marking	$R_{DS(on)}$ (Ω) Max.	t_{off} ns Max.	$V_{(BR)GSS}$	$V_{GS(off)}$		I_{DSS}		Style
					(V) Min.	(V) Max.	(mA) Min.	(mA) Max.	
MMBF4393LT1	6G	100	50	30	0.5	3.0	5.0	30	10

Surface Mount Choppers/Switches JFETs
Pinout: 1 — Drain, 2 — Source, 3 — Gate (Case 318-07 — TO-236AB (SOT-23) —P-Channel)

MMBFJ177LT1	6Y	300	—	–30	0.8	2.5	1.5	20	10

TMOS FETs
Pinout: 1 — Gate, 2 — Source, 3 — Drain (Case 318-07 — TO-236AB (SOT-23) — N-Channel)
The following is a listing of small-signal surface mount TMOS FETs which exhibit low $R_{DS(on)}$ characteristics.

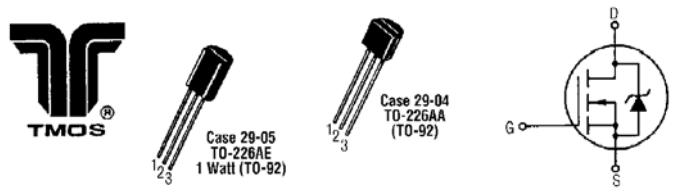
Mfr.'s Type	Marking	$R_{DS(on)}$ @ I_D		V_{DSS}	$V_{GS(th)}$		Switching Time		Style
		(Ω)	(mA)		(V) Min.	(V) Max.	t_{on} (ns)	t_{off} (ns)	
BSS123LT1	SA	6.0	100	100	0.8	2.8	20	40	21
2N7002LT1	702	7.5	500	60	1.0	2.5	20	20	21

TMOS FETs
Pinout: 1 — Gate, 2 — Drain, 3 — Source, 4 — Drain (Case 318E (SOT-223) — N-Channel)
The following is a listing of small-signal surface mount TMOS FETs which exhibit low $R_{DS(on)}$ characteristics.

MMFT960T1	FT960	1.7	1000	60	1.0	3.5	15	15	3

Field Effect Transistors

TMOS MOSFETs



TMOS Switches and Choppers (Case 29-05 — TO-226AE (1-WATT TO-92) — N-Channel)
The following is a listing of small-signal TMOS devices that are intended for switching and chopper applications. These devices offer low $R_{DS(on)}$ characteristics.

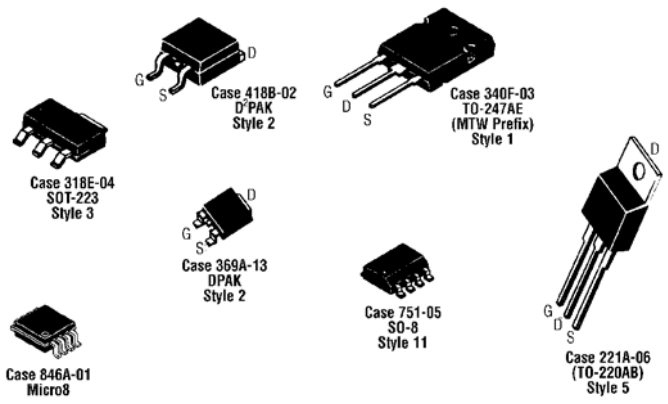
Mfr.'s Type	$R_{DS(on)}$ @ ID		$V_{GS(th)}$ (V)		$V_{(BR)DSS}$ (V) Min.	C_{iss} (pF) Max.	C_{rss} (pF) Max.	t_{on} (ns) Max.	t_{off} (ns) Max.	Style
	Ω Max.	(A)	Min.	Max.						
MPF960	1.7	1.00	1.0	3.5	60	70[1]	20.0[1]	15.0	15.0	22

TMOS Switches and Choppers (Case 29-04 — TO-226AA (TO-92) — N-Channel)

2N7000	5.0	0.50	0.8	3.0	60	60	5.0	10.0	10.0	22
BS170	5.0	0.20	0.8	3.0	60	25[1]	3.0[1]	10.0	10.0	30
BS107A	6.4	0.25	1.0	3.0	200	60[1]	6.0[1]	15.0	15.0	30
VN2222LL	7.5	0.50	0.6	2.5	60	60	5.0	10.0	10.0	22
BS107	14.0	0.20	1.0	3.0	200	60[1]	6.0[1]	15.0	15.0	30

[1]Typical.

Power TMOS® MOSFETs



DPAK

DPAK — N-Channel

Mfr.'s Type[4]	$V_{(BR)DSS}$ (V) Min.	$R_{DS(on)}$ (Ω) Max.	@ I_D (A)	I_D (Cont.) (A)	P_D[1] (W) Max.
MTD10N10EL	100	0.2200	5.00	10.0	1.75
MTD20N06HD	60	0.0450	10.00	20.0	1.75
MTD20N06HDL[2]	60	0.0450	10.00	20.0	1.75
MTD20N03HDL[2]	30	0.0350	10.00	20.0	1.75[3]

TO-220AB

TO-220AB — N-Channel

MTP1N100E	1000	9.0000	0.50	1.0	75.00
MTP3N100E	1000	4.0000	1.50	3.0	125.00
MTP4N80E	800	3.0000	2.00	4.0	125.00
MTP1N60E	600	8.0000	0.50	1.0	50.00
MTP3N60E	600	2.2000	1.50	3.0	75.00
MTP6N60E	600	1.2000	3.00	6.0	125.00
MTP2N50E	500	3.6000	1.00	2.0	75.00
MTP8N50E	500	0.8000	4.00	8.0	125.00
MTP5N40E	400	1.0000	2.50	5.0	75.00
MTP10N40E	400	0.5500	5.00	10.0	125.00
MTP20N20E	200	0.1600	10.00	20.0	125.00
MTP10N10E	100	0.2500	5.00	10.0	75.00
MTP12N10E	100	0.1600	6.00	12.0	75.00
MTP33N10E	100	0.0600	16.50	33.0	150.00
MTP52N06V	60	0.0240	26.00	52.0	135.00
MTP60N06HD	60	0.0140	30.00	60.0	150.00
MTP75N06HD	60	0.0100	37.50	75.0	150.00
MTP75N05HD	50	0.0095	37.50	75.0	150.00
MTP75N03HDL[2]	30	0.0075	37.50	75.0	150.00

TO-220AB — P-Channel

MTP6P20E	200	1.0000	3.00	6.0	75.00
MTP12P10	100	0.3000	6.00	12.0	88.00
MTP50P03HDL[2]	30	0.0250	25.00	50.0	150.00

[1]TC=25°C. [2]Indicates Logic Level. [3]Power rating when mounted on an FR-4 glass epoxy printed circuit board with the minimum recommended footprint. [4]Available in tape and reel — add T4 suffix to Part Number. [5]ESD protected to 4 KV.