MFE2004
MFE2005
MFE2006

CASE 22-03, STYLE 4
TO-18 (TO-206AA)

JFET
CHOPPER

N-CHANNEL — DEPLETION

Refer to 2N4091 for graphs.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	Vdc
Drain-Gate Voltage	V_{DG}	30	Vdc
Gate-Source Voltage	V_{GS}	30	Vdc
Forward Gate Current	I_{GF}	10	mAdc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	1.8 10	Watts mW/°C
Junction Temperature Range	T_J	−65 to +175	°C
Storage Temperature Range	T_{stg}	−65 to +200	°C

6

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Gate-Source Breakdown Voltage (I_G = 1.0 μAdc, V_{DS} = 0)		$V_{(BR)GSS}$	30	—	Vdc
Gate Reverse Current		I_{GSS}			
(V_{GS} = 20 Vdc, V_{DS} = 0)			—	0.2	nAdc
(V_{GS} = 20 Vdc, V_{DS} = 0, T_A = 150°C)			—	0.4	μAdc
Drain Cutoff Current		$I_{D(off)}$			
(V_{DS} = 20 Vdc, V_{GS} = 12 Vdc)			—	0.2	nAdc
(V_{DS} = 20 Vdc, V_{GS} = 12 Vdc, T_A = 150°C)			—	0.4	μAdc
Gate Source Voltage		V_{GS}			Vdc
(V_{DS} = 20 Vdc, I_D = 50 μAdc)	MFE2004		1.0	6.0	
	MFE2005		2.0	8.0	
	MFE2006		5.0	10	
ON CHARACTERISTICS					
Zero-Gate-Voltage Drain Current*		I_{DSS}*			mAdc
(V_{DS} = 20 Vdc, V_{GS} = 0)	MFE2004		8.0	—	
	MFE2005		15	—	
	MFE2006		30	—	
Gate-Source Forward Voltage (I_G = 1.0 mAdc, V_{DS} = 0)		$V_{GS(f)}$	—	1.0	Vdc
Drain-Source On-Voltage		$V_{DS(on)}$			Vdc
(I_D = 3.0 mAdc, V_{GS} = 0)	MFE2004		—	0.4	
(I_D = 6.0 mAdc, V_{GS} = 0)	MFE2005		—	0.4	
(I_D = 10 mAdc, V_{GS} = 0)	MFE2006		—	0.4	
Static Drain-Source On Resistance		$r_{DS(on)}$			Ohms
(I_D = 1.0 mAdc, V_{GS} = 0)	MFE2004		—	80	
	MFE2005		—	50	
	MFE2006		—	30	
SMALL-SIGNAL CHARACTERISTICS					
Static Drain-Source "ON" Resistance		$r_{ds(on)}$			Ohms
(V_{GS} = 0, I_D = 0, f = 1.0 kHz)	MFE2004		—	80	
	MFE2005		—	50	
	MFE2006		—	30	
Input Capacitance (V_{DS} = 0, V_{GS} = −12 Vdc, f = 1.0 MHz)		C_{iss}	—	16	pF

ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
Reverse Transfer Capacitance		C_{rss}			pF
(V_{DS} = 0, V_{GS} = 6.0 Vdc, f = 1.0 MHz)	MFE2004		—	5.0	
(V_{DS} = 0, V_{GS} = 8.0 Vdc, f = 1.0 MHz)	MFE2005		—	5.0	
(V_{DS} = 0, V_{GS} = 12 Vdc, f = 1.0 MHz)	MFE2006		—	5.0	
SWITCHING CHARACTERISTICS					
Turn-On Delay Time		$t_{d(on)}$			ns
(V_{DD} = 3.0 Vdc, I_D = 3.0 mAdc, V_{GS} = 0)	MFE2004		—	20	
(V_{DD} = 3.0 Vdc, I_D = 6.0 mAdc, V_{GS} = 0)	MFE2005		—	15	
(V_{DD} = 3.0 Vdc, I_D = 10 mAdc, V_{GS} = 0)	MFE2006		—	10	
Rise Time		t_r			ns
(V_{DD} = 3.0 Vdc, I_D = 3.0 mAdc, V_{GS} = 0)	MFE2004		—	40	
(V_{DD} = 3.0 Vdc, I_D = 6.0 mAdc, V_{GS} = 0)	MFE2005		—	20	
(V_{DD} = 3.0 Vdc, I_D = 10 mAdc, V_{GS} = 0)	MFE2006		—	10	
Turn-Off Time		t_{off}			ns
(V_{DD} = 3.0 Vdc, I_D = 3.0 mAdc, $V_{GS(off)}$ = 6.0 Vdc)	MFE2004		—	80	
(V_{DD} = 3.0 Vdc, I_D = 6.0 mAdc, $V_{GS(off)}$ = 8.0 Vdc)	MFE2005		—	60	
(V_{DD} = 3.0 Vdc, I_D = 10 mAdc, $V_{GS(off)}$ = 12 Vdc)	MFE2006		—	40	

*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 3.0%.