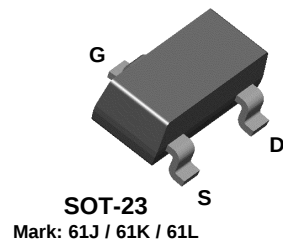
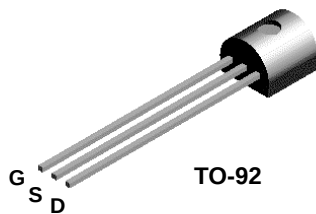


PN4091
PN4092
PN4093

MMBF4091
MMBF4092
MMBF4093



NOTE: Source & Drain
are interchangeable

N-Channel Switch

This device is designed for low level analog switching, sample and hold circuits and chopper stabilized amplifiers. Sourced from Process 51. See J111 for characteristics.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{DG}	Drain-Gate Voltage	40	V
V_{GS}	Gate-Source Voltage	- 40	V
I_{GF}	Forward Gate Current	50	mA
T_J, T_{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations

Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max		Units
		PN4091-4093	*MMBF4091-4093	
P_D	Total Device Dissipation Derate above 25°C	625 5.0	350 2.8	mW mW/°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	125		°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	556	°C/W

*Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06."

PN4091 / 4092 / 4093 / MMBF4091 / 4092 / 4093

N-Channel Switch

(continued)

Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
OFF CHARACTERISTICS					
$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	$I_G = 1.0 \mu A, V_{DS} = 0$	- 40		V
$V_{GS(off)}$	Gate-Source Cutoff Voltage	$V_{DS} = 20 V, I_D = 1.0 nA$	4091 - 5.0 4092 - 2.0 4093 - 1.0	- 10 - 7.0 - 5.0	V V V
I_{DGO}	Drain-Gate Leakage Current	$V_{DG} = 20 V, I_S = 0$ $V_{DG} = 20 V, I_S = 0, T_A = 150^\circ C$		- 200 - 400	pA nA
$I_{D(off)}$	Drain Cutoff Leakage Current	$V_{DS} = 20 V, V_{GS} = - 12 V$ 4091 $V_{DS} = 20 V, V_{GS} = - 8.0 V$ 4092 $V_{DS} = 20 V, V_{GS} = - 6.0 V$ 4093 $V_{DS} = 20 V, V_{GS} = - 12 V,$ $T_A = 150^\circ C$ 4091 $V_{DS} = 20 V, V_{GS} = - 8.0 V,$ $T_A = 150^\circ C$ 4092 $V_{DS} = 20 V, V_{GS} = - 6.0 V,$ $T_A = 150^\circ C$ 4093		200 200 200 400 400 400	pA pA pA nA nA nA
ON CHARACTERISTICS					
I_{DSS}	Zero-Gate Voltage Drain Current*	$V_{DS} = 20 V, V_{GS} = 0$	4091 30 4092 15 4093 8.0		mA mA mA
$V_{DS(on)}$	Drain-Source On Voltage	$I_D = 6.6 mA, V_{GS} = 0$ 4091 $I_D = 4.0 mA, V_{GS} = 0$ 4092 $I_D = 2.5 mA, V_{GS} = 0$ 4093		0.2 0.2 0.2	V V V
$r_{DS(on)}$	Drain-Source On Resistance	$I_D = 1.0 mA, V_{GS} = 0$	4091 4092 4093	30 50 80	Ω Ω Ω
SMALL-SIGNAL CHARACTERISTICS					
$r_{ds(on)}$	Drain-Source On Resistance	$V_{DS} = V_{GS} = 0, f = 1.0 kHz$	4091 4092 4093	30 50 80	Ω Ω Ω
C_{iss}	Input Capacitance	$V_{DS} = 20, V_{GS} = 0, f = 1.0 MHz$		16	pF
C_{rss}	Reverse Transfer Capacitance	$V_{GS} = - 20 V, f = 1.0 MHz$		5.0	pF
SWITCHING CHARACTERISTICS					
t_{on}	Turn-On Time	$I_{D(on)} = 12 mA$ 4091 $I_{D(on)} = 6.0 mA$ 4092 $I_{D(on)} = 3.0 mA$ 4093		25 35 60	ns ns ns
t_{off}	Turn-Off Time	$V_{GS(off)} = 12 V$ 4091 $V_{GS(off)} = 6.0 V$ 4092 $V_{GS(off)} = 3.0 V$ 4093		40 60 80	ns ns ns

*Pulse Test: Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 1.0\%$

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