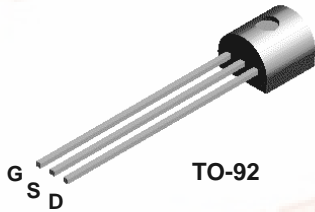


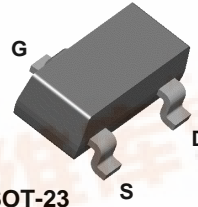


**PN4091
PN4092
PN4093**

**MMBF4091
MMBF4092
MMBF4093**



TO-92



SOT-23

Mark: 61J / 61K / 61L

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	350	mW
		5.0	2.8	mW/°C
R _{θJC}	Thermal Resistance, Junction to Case	125		°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	357	556	°C/W

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



N-Channel Switch

(continued)

Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
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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	- 10
			4092	- 2.0	- 7.0
			4093	- 1.0	- 5.0
I_{DGO}	Drain-Gate Leakage Current	$V_{DG} = 20 V, I_S = 0$			- 200
		$V_{DG} = 20 V, I_S = 0, T_A = 150^\circ C$			- 400
$I_{D(off)}$	Drain Cutoff Leakage Current	$V_{DS} = 20 V, V_{GS} = - 12 V$	4091		200
		$V_{DS} = 20 V, V_{GS} = - 8.0 V$	4092		200
		$V_{DS} = 20 V, V_{GS} = - 6.0 V$	4093		200
		$V_{DS} = 20 V, V_{GS} = - 12 V,$ $T_A = 150^\circ C$	4091		400
		$V_{DS} = 20 V, V_{GS} = - 8.0 V,$ $T_A = 150^\circ C$	4092		400
		$V_{DS} = 20 V, V_{GS} = - 6.0 V,$ $T_A = 150^\circ C$	4093		400

ON CHARACTERISTICS

I_{DSS}	Zero-Gate Voltage Drain Current*	$V_{DS} = 20 V, V_{GS} = 0$		30 15 8.0	mA mA mA
$V_{DS(on)}$	Drain-Source On Voltage	$I_D = 6.6 mA, V_{GS} = 0$	4091		0.2
		$I_D = 4.0 mA, V_{GS} = 0$	4092		0.2
		$I_D = 2.5 mA, V_{GS} = 0$	4093		0.2
$r_{DS(on)}$	Drain-Source On Resistance	$I_D = 1.0 mA, V_{GS} = 0$	4091		30
			4092		50
			4093		80

SMALL-SIGNAL CHARACTERISTICS

$r_{ds(on)}$	Drain-Source On Resistance	$V_{DS} = V_{GS} = 0, f = 1.0 kHz$		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	$I_{D(on)} = 12 mA$		25	ns
t_{off}	Turn-Off Time	$I_{D(on)} = 6.0 mA$	4092		35
		$I_{D(on)} = 3.0 mA$	4093		60
		$V_{GS(off)} = 12 V$	4091		40
		$V_{GS(off)} = 6.0 V$	4092		60
		$V_{GS(off)} = 3.0 V$	4093		80

*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 1.0%

PN4091 / 4092 / 4093 / MMBF4091 / 4092 / 4093

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