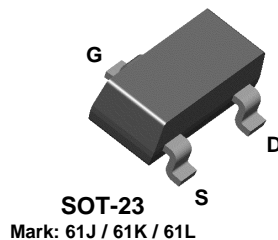
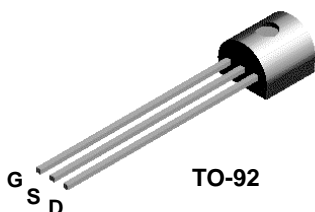


**PN4091
PN4092
PN4093**

**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	625	350	mW
	Derate above 25°C	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
--------	-----------	-----------------	-----	-----	-------

OFF CHARACTERISTICS

V _{(BR)GSS}	Gate-Source Breakdown Voltage	I _G = 1.0 μA, 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	pA
		V _{DG} = 20 V, I _S = 0, T _A = 150°C		- 400	nA
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°C	4091		400
		V _{DS} = 20 V, V _{GS} = - 8.0 V, T _A = 150°C	4092		400
		V _{DS} = 20 V, V _{GS} = - 6.0 V, T _A = 150°C	4093		400
		V _{DS} = 20 V, V _{GS} = - 6.0 V, T _A = 150°C	4093		400

ON CHARACTERISTICS

I _{DSS}	Zero-Gate Voltage Drain Current*	V _{DS} = 20 V, V _{GS} = 0	4091	30	mA
			4092	15	mA
			4093	8.0	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	4091		30
			4092		50
			4093		80
C _{iss}	Input Capacitance	V _{DS} = 20, V _{GS} = 0, f = 1.0 MHz			16
C _{rss}	Reverse Transfer Capacitance	V _{GS} = - 20 V, f = 1.0 MHz			5.0

SWITCHING CHARACTERISTICS

t _{on}	Turn-On Time	I _{D(on)} = 12 mA	4091		25
		I _{D(on)} = 6.0 mA	4092		35
		I _{D(on)} = 3.0 mA	4093		60
t _{off}	Turn-Off Time	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

TRADEMARKS

The following are registered and unregistered trademarks Fairchild Semiconductor owns or is authorized to use and is not intended to be an exhaustive list of all such trademarks.

ACEx™	FASTr™	PowerTrench®	SyncFET™
Bottomless™	GlobalOptoisolator™	QFET™	TinyLogic™
CoolFET™	GTO™	QS™	UHC™
CROSSVOLT™	HiSeC™	QT Optoelectronics™	VCX™
DOME™	ISOPLANAR™	Quiet Series™	
E ² CMOS™	MICROWIRE™	SILENT SWITCHER®	
EnSigna™	OPTOLOGIC™	SMART START™	
FACT™	OPTOPLANAR™	SuperSOT™-3	
FACT Quiet Series™	PACMAN™	SuperSOT™-6	
FAST®	POP™	SuperSOT™-8	

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	This datasheet contains preliminary data, and supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
Obsolete	Not In Production	This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.