Microsemi

WATERTOWN DIVISION

UPF1N50

SURFACE MOUNT N CHANNEL MOSFET

PRELIMINARY

DESCRIPTION

Power MOSFET in ultra low profile patented Powermite 3(TM) package provides the designer with the best combination of fast Switching, ruggedized device design, low on-resistance, cost effectiveness in the industry's smallest high power surface mount package.

The UPF1N50 is ideal for ultra small motor control and switch mode power supply applications.

The Powermite 3 is designed for surface mounting using vapor phase, infrared, or wave soldering techniques. With power dissipation levels up to 1.8 Watts, the Powermite 3 offers similar power handling capability to device 4 times its size by using a patented full metal wrap around bottom.

IMPORTANT: For the most current data, consult *MICROSEMI*'s website: **http://www.microsemi.com**

KEY FEATURES

- POWERMITE 3 Surface Mount Package
- Low On-State Resistance
- High Frequency Switching
- Ultra Low Leakage current
- Integral Heat Sink / Locking Tabs
- Supplied in 16mm Tape and Reel – 6000 units/reel
- Superior Low Thermal And Electrical capability

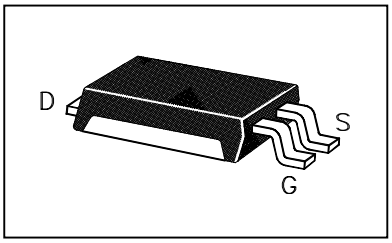
APPLICATIONS/BENEFITS

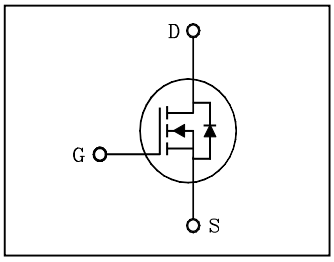
- Motor Control
- Switch Mode Power Supplies

MECHANICAL CHARACTERISTICS

POWERMITE 3 Surface Mount Package

- Footprint Area of 16.51 mm^2
- Case: Molded Epoxy
- Meets UL94VO at 1/8 inch
- Weight: 72 milligrams
- Lead and Mounting Temperatures: 260 ^{0}C max for 10 seconds





MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
Drain-to-Source Voltage	V_{DSS}	500	Volts
Drain-to-Source Voltage	V_{GS}	+/-20	Volts
Continuous Drain Current @ TC = 25ºC	I_{D1}	1.0	Amps
Continuous Drain Current @ TC = 100ºC	I_{D2}	0.8	Amps
Operating & Storage Junction Temperature Range	T_J, T_{STG}	- 40 to + 125	ºC
Total Power Dissipation	PD (1)	1.8	Watts

THERMAL CHARACTERISTICS

STEADY-STATE THERMAL RESISTANCE:	SYMBOL	VALUE	UNIT
Junction-to-Tab	$R\theta_{J\text{-}TAB}$	2.0	°C/Watts
(1) Junction-to-ambient	RθJA (1)	55	°C/Watts
(2) Junction-to-ambient	RθJA (2)	120	°C/Watts

(1) Mounted on 2" square by 0.06' thick FR4 board with a 1"× 1" square 2-ounce copper pattern.
(2) Mounted on 0.06' thick FR4 board, using recommended footprint.

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580 Pleasant Street, Watertown, MA. 02472, 617-926-0404, Fax: 617-924-1235

UPF1N50

STATIC ELECTRICAL CHARACTERISTICS

SYMBOL	CHARACTERISTICS / TEST CONDITIONS		UPF1N50 Min	UPF1N50 Typ	UPF1N50 Max	Units
BV_{DSS}	Drain to Source Breakdown Voltage	(VGS=0V, ID=0.25mA)	500			Volts
$V_{GS(TH)2}$	Gate Threshold Voltage	(VDS≥VGS, ID=1mA, TJ=37°C)	2.0	3.4	4.0	Volts
$V_{GS(TH)1}$	Gate Threshold Voltage	(VDS≥VGS, ID=1mA, TJ=25°C)		3.5		Volts
$R_{DS(ON)1}$	Drain to Source ON-State Resistance	(VGS=10V, ID=1.0A, TJ=25°C)		2.7	3.5	Ohms
I_{DSS1}	Zero Gate Voltage-Drain Current	(VDS=400V,VGS=0V,TJ= 25°C)			2	uA
I_{DSS2}	Zero Gate Voltage-Drain Current	(VDS=400V,VGS=0V,TJ=125°C)			250	uA
I_{GSS1}	Gate to Source Leakage Current	(VGS= ±20V, VDS=0V, TJ = 25°C)			±100	nA

STATIC ELECTRICAL CHARACTERISTICS

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	Min	Typ	Max	UNIT
Ciss Coss Crss	Input Capacitance Output Capacitance Reverse Transfer Capacitance	V_{GS}= 0 V V_{DS}= 50 V f = 1MHz		200 30 15	250 50 20	pF pF pF
Qg Qgs Qgd	Total Gate Charge Gate to Source Charge Gate to Drain Charge	V_{GS}= 10 V V_{DS}= 0.5 V_{DSS} I_D= 10 mA		20 1.0 10		nC nC nC
td (on)	Turn-ON Delay Time	Resistive Switching (25°C)		20		ns
tr	Rise Time	V_{GS}= 10 V, V_{DS}= 0.5 BV_{DSS}		10		ns
td	Turn-OFF Delay Time	I_D = 20 mA		30		ns
tf	Fall Time	Rg = 1.6 Ω		30		us
V_{SD}	Diode Forward Voltage	V_{GS}= 0 V, I_S = 1 A, T_J = 25°C		0.85	1.2	V
trr	Reverse Recovery Time	I_S = 1 A, dIs/dt = 100 A/us			150	ns
Qrr	Reverse Recovery Charge	I_S = 1 A, dIs/dt = 100 A/us			0.8	uC

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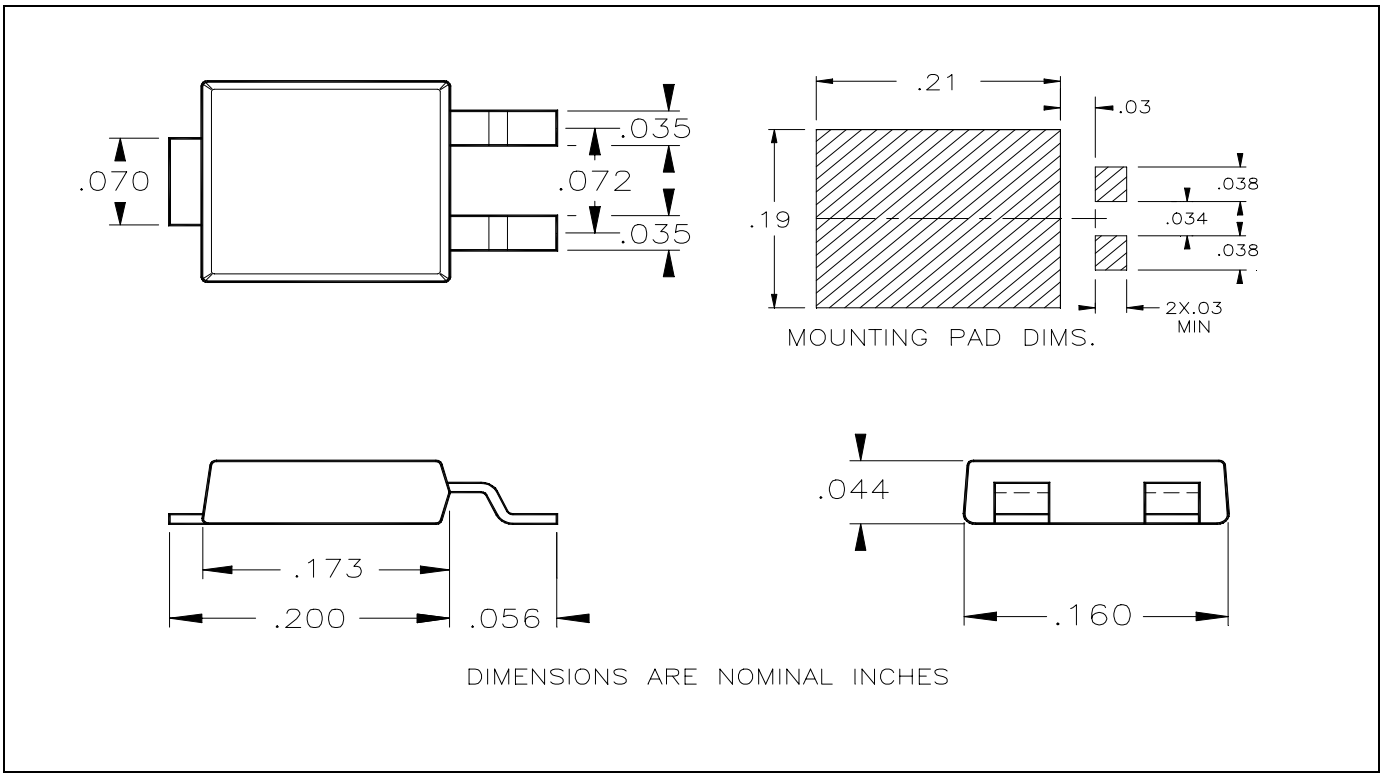

MECHANICAL SPECIFICATIONS

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