

MSAFX75N10A

Features

- Ultrafast body diode
- Rugged polysilicon gate cell structure
- Increased Unclamped Inductive Switching (UIS) capability
- Hermetically sealed, surface mount power package
- Low package inductance
- Very low thermal resistance
- Reverse polarity available upon request

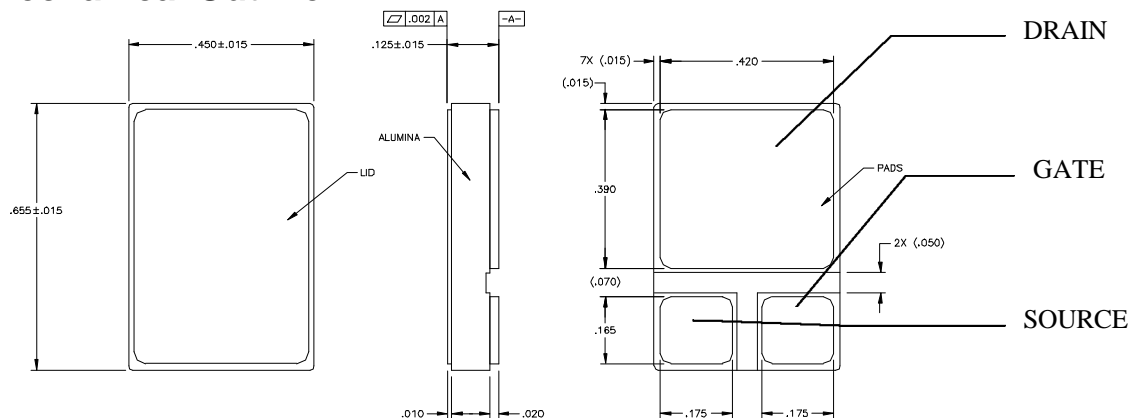
100 Volts
75 Amps
20 mΩ

N-CHANNEL
ENHANCEMENT MODE
POWER MOSFET

Maximum Ratings @ 25°C (unless otherwise specified)

DESCRIPTION	SYMBOL	MAX.	UNIT
Drain-to-Source Breakdown Voltage (Gate Shorted to Source) @ T _J ≥ 25°C	BV _{DSS}	100	Volts
Drain-to-Gate Breakdown Voltage @ T _J ≥ 25°C, R _{GS} = 1 MΩ	BV _{DGR}	100	Volts
Continuous Gate-to-Source Voltage	V _{GS}	+/-20	Volts
Transient Gate-to-Source Voltage	V _{GSM}	+/-30	Volts
Continuous Drain Current 100°C	I _{D25} I _{D100}	75 60	Amps
Peak Drain Current, pulse width limited by T _{Jmax}	I _{DM}	300	Amps
Repetitive Avalanche Current	I _{AR}	75	Amps
Repetitive Avalanche Energy	E _{AR}	30	mJ
Single Pulse Avalanche Energy	E _{AS}	tbd	mJ
Voltage Rate of Change of the Recovery Diode @ I _S ≤ I _{DM} , di/dt ≤ 100 A/μs, V _{DD} ≤ V _{DSS} , T _J ≤ 150°C	dv/dt	5.0	V/ns
Power Dissipation	P _D	300	Watts
Junction Temperature Range	T _J	-55 to +150	°C
Storage Temperature Range	T _{stg}	-55 to +150	°C
Continuous Source Current (Body Diode)	I _S	75	Amps
Pulse Source Current (Body Diode)	I _{SM}	300	Amps
Thermal Resistance, Junction to Case	θ _{JC}	0.25	°C/W

Mechanical Outline



Electrical Parameters @ 25°C (unless otherwise specified)

DESCRIPTION	SYMBOL	CONDITIONS	MIN	TYP.	MAX	UNIT
Drain-to-Source Breakdown Voltage (Gate Shorted to Source)	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	100			V
Temperature Coefficient of the Drain-to-Source Breakdown Voltage	$\Delta BV_{DSS}/\Delta T_J$			tbd		V/°C
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 4\text{ mA}$	2.0		4.0	V
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20V_{DC}, V_{DS} = 0\text{ V}, T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$			± 100 ± 200	nA
Drain-to-Source Leakage Current (Zero Gate Voltage Drain Current)	I_{DSS}	$V_{DS} = 0.8 \cdot BV_{DSS}, T_J = 25^\circ\text{C}$ $V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			200 1000	μA
Static Drain-to-Source On-State Resistance (1)	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 37.5\text{ A}, T_J = 25^\circ\text{C}$ $I_D = 75\text{ A}, T_J = 25^\circ\text{C}$ $I_D = 37.5\text{ A}, T_J = 125^\circ\text{C}$		0.02 0.035	0.02	Ω
Forward Transconductance (1)	g_{fs}	$V_{DS} \geq 10\text{ V}, I_D = 75\text{ A}$	25	30		S
Input Capacitance Output Capacitance Reverse Transfer Capacitance	C_{iss} C_{oss} C_{rss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		4500 1600 800		pF
Turn-on Delay Time Rise Time Turn-off Delay Time Fall Time	$t_{d(on)}$ t_r $t_{d(off)}$ t_f	$V_{GS} = 10\text{ V}, V_{DS} = 50\text{ V},$ $I_D = 37.5\text{ A}, R_G = 2.00\ \Omega$		20 60 80 60	30 110 110 90	ns
Total Gate Charge Gate-to-Source Charge Gate-to-Drain (Miller) Charge	$Q_{g(on)}$ Q_{gs} Q_{gd}	$V_{GS} = 10\text{ V}, V_{DS} = 50\text{ V}, I_D = 37.5\text{ A}$		180 36 85	260 70 160	nC
Body Diode Forward Voltage (1)	V_{SD}	$I_F = I_S, V_{GS} = 0\text{ V}$			1.75	V
Reverse Recovery Time (Body Diode)	t_{rr}	$I_F = 10\text{ A}, 25\text{ C}$ $-di/dt = 100\text{ A}/\mu\text{s}, 125\text{ C}$			200 300	ns
Reverse Recovery Charge	Q_{rr}	$I_F = 10\text{ A}, 25\text{ C}$ $di/dt = 100\text{ A}/\mu\text{s}, 125\text{ C}$		tbd tbd		μC

Notes

- (1) Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\delta \leq 2\%$
- (2) Microsemi Corp. does not manufacture the mosfet die; contact company for details.