



SANTA ANA DIVISION

MSAFA75N10C

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

PRODUCT PREVIEW

DESCRIPTION

New generation N-channel enhancement mode power MOSFET with rugged polysilicon gate structure and fast switching intrinsic rectifier. The very rugged Coolpack2™ surface-mount package is lightweight, space saving and hermetically sealed for high reliability and/or military/space application.

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

KEY FEATURES

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

APPLICATIONS/BENEFITS

- DC-DC converters
- Motor controls
- Uninterruptible Power Supply(UPS)
- DC choppers
- Synchronous rectification
- Inverters

MAXIMUM RATINGS @ 25°C (unless otherwise specified)

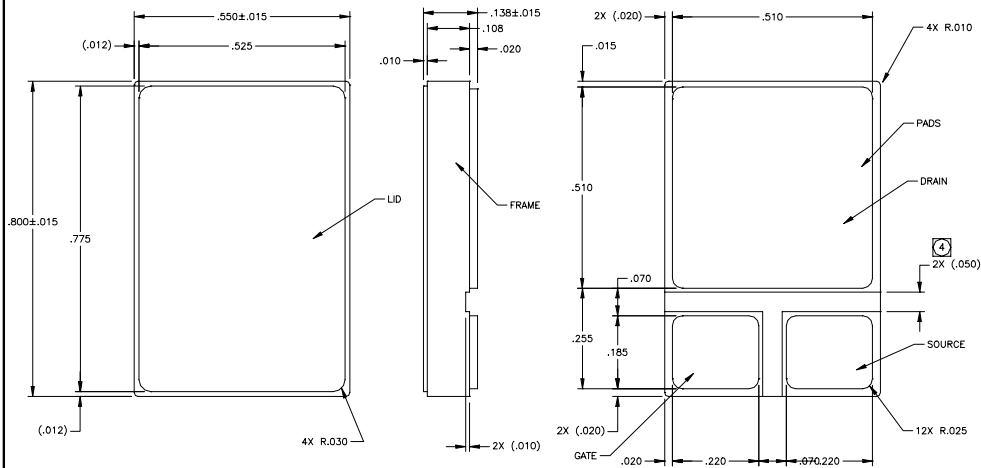
Description	Symbol	Max.	Unit	
Drain-to-Source Voltage (Gate Shorted to Source)	V _{DSS}	100	Volts	
Continuous Gate-to-Source Voltage	V _{GS}	+/-30	Volts	
Transient Gate-to-Source Voltage	V _{GS} M	+/-40	Volts	
Continuous Drain Current		T _j = 25°C	75	Amps
		T _j = 100°C	60	
Peak Drain Current, pulse 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 (3)	E _{AS}	1500	mJ	
Total Power Dissipation @ T _c =25°C	P _D	540	Watts	
Junction Temperature Range	T _J	-55 to	°C	
		+150		
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}	0.23	°C/W	

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
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS} = \pm 30\text{ V}_{DC}, V_{DS} = 0$			± 100	nA
Drain-to-Source Leakage Current (Zero Gate Voltage Drain Current)	I_{DSS}	$V_{DS} = 0.8 \cdot BV_{DSS}$ $T_J = 25^\circ\text{C}$ $V_{GS} = 0\text{ V}$ $T_J = 125^\circ\text{C}$			250 1000	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 1\text{ mA}$	2.0		4.0	V
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	0.019	Ω
Input Capacitance Output Capacitance Reverse Transfer Capacitance	C_{iss} C_{oss} C_{rss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		5100 1900 800	6120 2660 1200	pF
Turn-on Delay Time Rise Time Turn-off Delay Time Fall Time	$t_{d(on)}$ t_r $t_{d(off)}$ t_f	$V_{GS} = 15\text{ V}, V_{DS} = 50\text{ V},$ $I_D = 37.5\text{ A}, R_G = 1.6\ \Omega$		16 40 50 20	32 40 75 40	ns
Total Gate Charge Gate-to-Source Charge Gate-to-Drain (Miller) Charge	$Q_{g(on)}$ Q_{gs} Q_{gd}	$V_{GS} = 10\text{ V}, V_{DS} = 50\text{ V}, I_D = 37.5\text{ A}$		200 40 92	300 60 180	nC
Body Diode Forward Voltage (1)	V_{SD}	$I_S = 75\text{ A}, V_{GS} = 0\text{ V}$			1.3	V
Reverse Recovery Time (Body Diode)	t_{rr}	$I_F = 10\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		200		ns
Reverse Recovery Charge	Q_{rr}	$I_F = 10\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		1.4		μC

**Mechanical Outline
CoolPack™2**

Note: Pin-out shown for
standard polarity





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