

MOSFET Device

Features

- Low On-State resistance
- Avalanche and Surge Rated
- High Frequency Switching
- Ultra low Leakage Current
- UIS rated
- Available with Lot Acceptance Testing "L" Suffix
- Available with "J" leads

Applications

- Implantable Cardio Defibrillator

Testing and Screening (per lot)

- 100% Testing at 25C, DC parameters
- Sample Test (22/0), AC, Hot and Cold Parameters (min/max limits)

**1 Amp
1000 V
N-Channel
enhancement mode high
density**

Maximum Ratings

SYMBOL	PARAMETER	VALUE	UNIT
VDSS	Drain - Source Voltage	1000	Volts
VGS	Gate - Source Voltage	±20	Volts
ID1	Continuous Drain Current @ TC = 25	1	Amps
ID2	Continuous Drain Current @ TC = 100	0.8	Amps
IDM1	Pulsed Drain Current	4	Amps
IAR	Avalanche Current	1	Amps
EAR	Repetitive Avalanche Energy	TBD	mJ
EAS	Single Pulse Avalanche Energy	TBD	mJ
TJ, TSTG	Operating and Storage: Junction Temperature Range	-55 to 150	C

Static Electrical Characteristics

SYMBOL	CHARACTERISTIC / TEST CONDITIONS	MIN	TYP	MAX	UNIT
BVDSS	Drain - Source Breakdown Voltage (VGS = 0V, ID = 0.25mA)	1000			Volts
VGS(TH)2	Gate Threshold Voltage (VGS= VDS, ID = 1 mA, TJ = 37C)		3.4		Volts
VGS(TH)1	Gate Threshold Voltage (VGS= VDS, ID = 1 mA, TJ = 25C)	2	3.5	4.5	Volts
RDS(ON)1	Drain - Source On-State Resistance (VGS = 10V, ID = ID1, TJ = 25C)		12.5	13.5	ohm
RDS(ON)2	Drain - Source On-State Resistance (VGS = 7V, ID = 5...150 mA, TJ= 37C)		12.5		ohm
RDS(ON)3	Drain - Source On-State Resistance (VGS = 7V, ID = 5...150 mA, TJ= 25C)		11.5	14	ohm
RDS(ON)4	Drain - Source On-State Resistance (VGS = 7V, ID = 5...150 mA, TJ= 60C)		15		ohm
RDS(ON)5	Drain - Source On-State Resistance (VGS = 7V, ID = ID1, TJ = 125C)		23.5		ohm
IDSS1	Zero Gate Voltage Drain Current (VDS = 80%BVDSS, VGS = 0V, TJ = 25C)			10	uA
IDSS2	Zero Gate Voltage Drain Current (VDS = 80%BVDSS, VGS = 0V, TJ = 37C)		1		uA
IDSS3	Zero Gate Voltage Drain Current (VDS = 80%BVDSS, VGS = 0V, TJ = 125C)			100	uA
IGSS1	Gate-Source Leakage Current (VGS = ±20V, VCE =0V)			±100	nA
IGSS2	Gate-Source Leakage Current (VGS= ±20V VCE =0V), Tj= 37C		10		nA
IGSS3	Gate-Source Leakage Current (VGS= ±20V VCE =0V), Tj= 125C			500	nA

MSAFA1N100P3

Fast MOSFET for
Implantable Cardio Defibrillator
Applications

Dynamic Electrical Characteristics

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Ciss	Input Capacitance	VGS = 0V		290	350	pF
Coss	Output Capacitance	VDS = 25V		36	45	pF
Crss	Reverse Transfer Capacitance	f = 1 MHz		15	25	pF
Qg	Total Gate Charge	VGS = 10V		20		nC
Qgs	Gate-Source Charge	VDS = 0.5BVDSS		1		nC
Qgd	Gate-Drain ("Miller") Charge	IC = 20 mA		10		nC
td (on)	Turn-on Delay Time	Resistive Switching (25C)		6.3		ns
tr	Rise Time	VGS = 10V, VDS = 0.5BVDSS		5.9		ns
td (off)	Turn-off Delay Time	ID = 20 mA		315		ns
tf	Fall Time	Rg = 1.6 Ohms		2.6		us
td (on)	Turn-On Delay Time	Resistive Switching (25C)		6.3		ns
tr	Rise Time	VGS = 10V, VDS = 0.5BVDSS		5.8		ns
td (off)	Turn-off Delay Time	ID = 100 mA		76		ns
tf	Fall Time	Rg = 1.6 Ohms		470		ns
VSD	Diode Forward Voltage	VGS = 0 V, IS = 1 A			1	V
trr	Reverse Recovery Time	IS = 1 A, d IS / dt = 100 A/us			130	ns
Qrr	Reverse Recovery Charge	IS = 1 A, d IS / dt = 100 A/us			0.7	uC

