MLSM MICROELECTRONICS

MT1F05A

150V/5A N-Channel MOSFET

Features

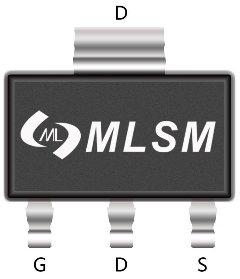
- High density cell design for ultra low $R_{DS(ON)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

Product Summary

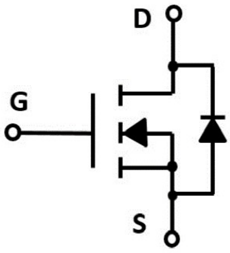
V_{DS}	$R_{DS(ON)}$ MAX	I_D MAX
150V	160mΩ@10V 220mΩ@4.5V	5A

Application

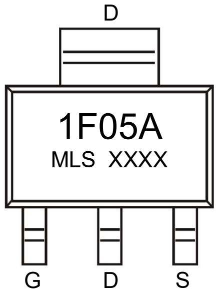
- Power switching application



SOT-223 top view



Schematic diagram



1F05A: Device code
XXXX: Code

Marking and pin assignment

Pb-Free RoHS Halogen-Free

Absolute Maximum Ratings (TA=25℃unless otherwise noted)				
Symbol	**Parameter**		**Rating**	**Unit**
Common Ratings (TC=25°C Unless Otherwise Noted)				
V_{DS}	Drain-Source Breakdown Voltage		150	V
V_{GS}	Gate-Source Voltage		±20	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-50 to 155	°C
I_S	Diode Continuous Forward Current	Tc=25°C	5	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested	Tc=25°C	16	A
I_D	Continuous Drain Current	Tc=25°C	5	A
P_D	Maximum Power Dissipation	Tc=25°C	10	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		215	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MT1F05A	SOT-223	1F05A	2,500	5,000	35,000	13"reel

Electrical Characteristics (TJ=25℃ unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
$BV_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	150	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=150V, V_{GS}=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.5	--	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=5A	--	130	160	mΩ
		V_{GS}=4.5V, I_D=4A	--	150	220	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{ISS}	Input Capacitance	V_{DS}=75V, V_{GS}=0V, f=1MHz	--	245	--	pF
C_{OSS}	Output Capacitance		--	27	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	3.6	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=75V, I_D=4A, V_{GS}=10V	--	4.9	--	nC
Q_{gs}	Gate Source Charge		--	0.3	--	nC
Q_{gd}	Gate Drain Charge		--	0.9	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=75V, I_D=4A, V_{GS}=10V, R_G=3Ω	--	3.1	--	nS
t_r	Turn-on Rise Time		--	2.7	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	7.9	--	nS
t_f	Turn-Off Fall Time		--	2	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	Tj=25℃, Is=4A	--	--	1.2	V

Typical Operating Characteristics

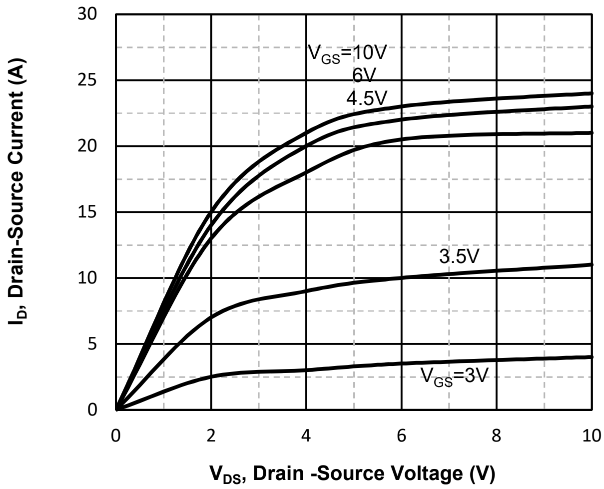


Fig1. Typical Output Characteristics

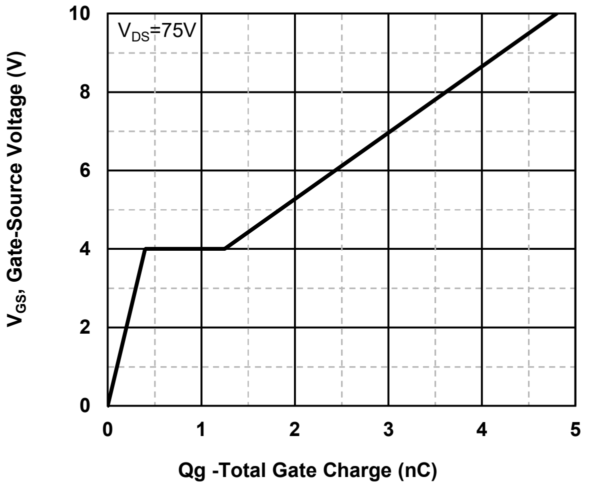


Fig2. Typical Gate Charge Vs.Gate-Source Voltage

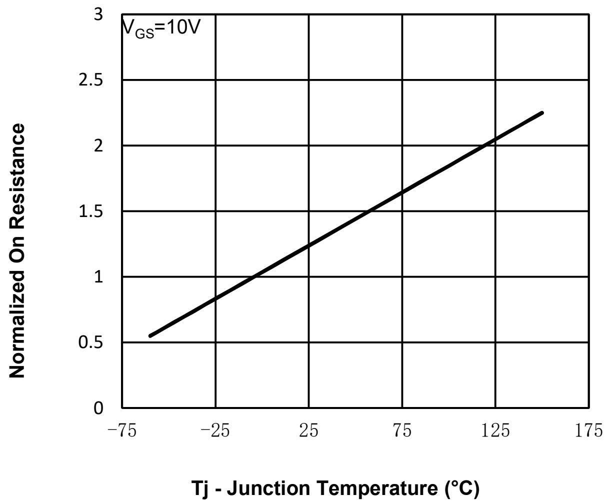


Fig3. Normalized On-Resistance Vs. Temperature

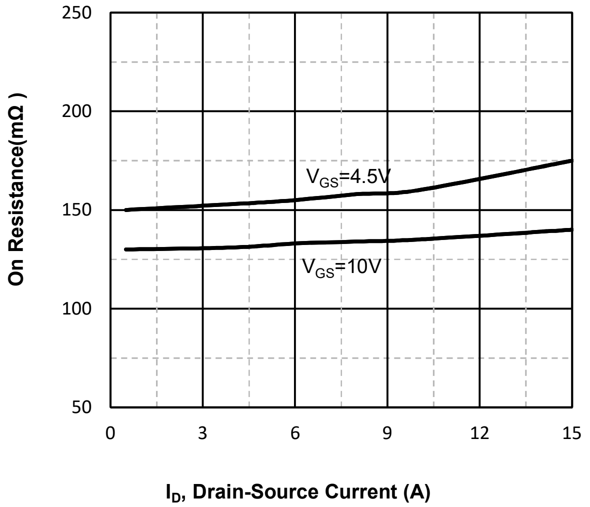


Fig4. On-Resistance Vs. Drain-Source Current

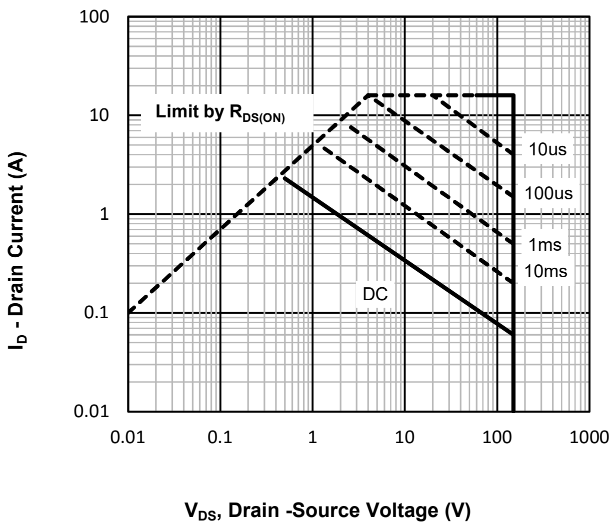


Fig5. Maximum Safe Operating Area

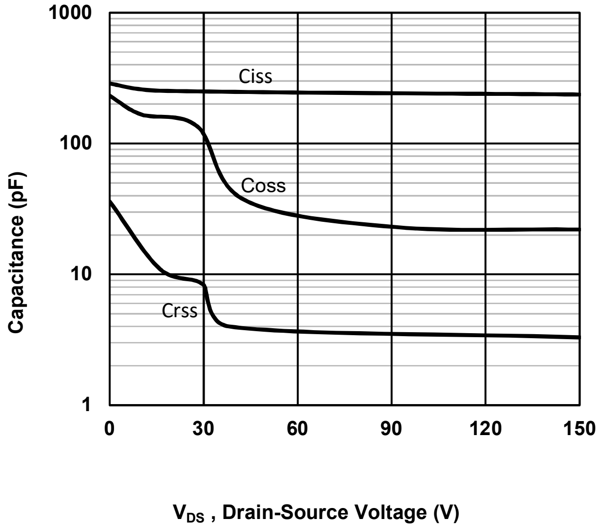
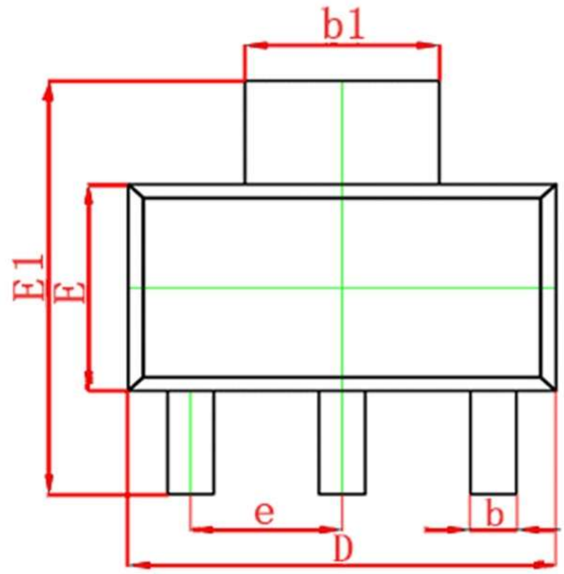
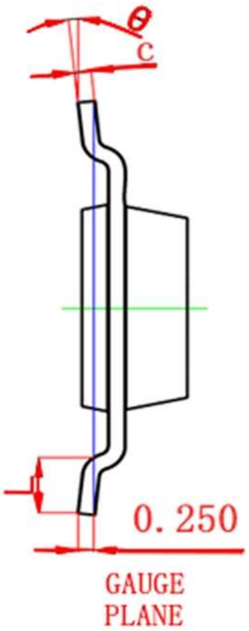
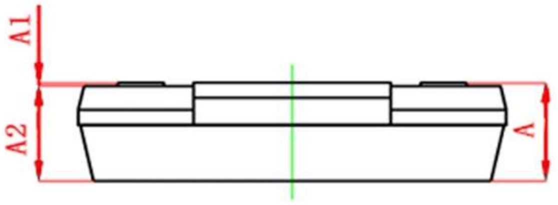


Fig6 Typical Capacitance Vs.Drain-Source

SOT-223 Package information







Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	--	1.800	--	0.071
A1	0.020	0.100	0.001	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.840	0.026	0.033
b1	2.900	3.100	0.114	0.122
c	0.230	0.350	0.009	0.014
D	6.300	6.700	0.248	0.264
E	3.300	3.700	0.130	0.146
E1	6.700	7.300	0.264	0.287
e	2.300(BSC)		0.091(BSC)	
L	0.750	--	0.030	--
θ	0°	10°	0°	10°