MU1A90AG

100V/90A N-Channel MOSFET

Features

- High Speed Power Switching,Logic level
- Enhanced Body diode DV/DT capability
- Ehanced Avalanche Ruggedness
- 100% UIS Tested, 100% Rg Tested
- Lead Free, Halogen Free

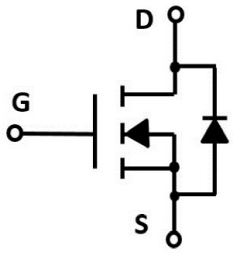
Application

- DC/DC Converter
- Motor Drivers
- Ideal for high-frequency switching and synchronous rectification

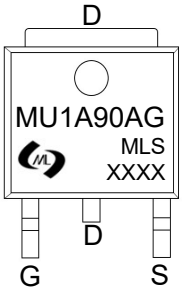
Product Summary

V_{DS}	$R_{DS(ON)}$ MAX	I_D MAX
100V	6.5mΩ@10V	90A

TO-252 top view



Schematic diagram



MU1A90AG: 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		100	V
V_{GS}	Gate-Source Voltage		±20	V
E_{AS}	Single pulse avalanche energy[Note1]		272	mJ
T_J,T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	Tc=25°C	90	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested	Tc=25°C	340	A
I_D	Continuous Drain Current	Tc=25°C	90	A
P_D	Maximum Power Dissipation	Tc=25°C	76	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		55	°C/W

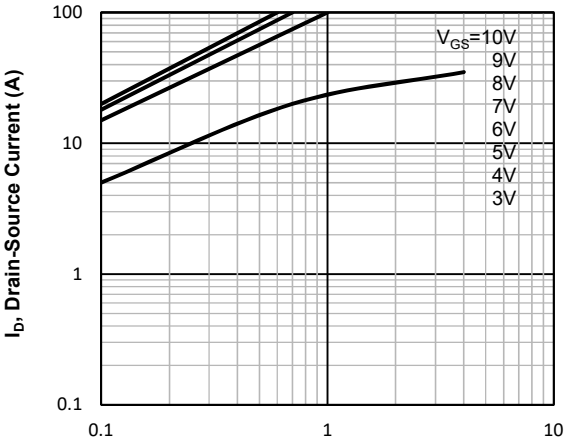
Ordering Information (Example)						
Type	**Package**	**Marking**	**Minimum Package(pcs)**	**Inner Box Quantity(pcs)**	**Outer Carton Quantity(pcs)**	**Delivery Mode**
MU1A90AG	TO-252	MU1A90AG	2,500	5,000	35,000	13"reel

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	100	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V，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	2	--	4	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V， I_D=25A	--	5.3	6.5	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{ISS}	Input Capacitance	V_{DS}=50V，V_{GS}=0V， f=1MHz	--	2208	--	pF
C_{OSS}	Output Capacitance		--	702	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	21	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DD}=50V，I_D=30A，V_{GS}=10V	--	41	--	nC
Q_{gs}	Gate Source Charge		--	6.4	--	nC
Q_{gd}	Gate Drain Charge		--	10	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=50V，I_D=20A，V_{GS}=10V，R_G=3Ω	--	18.2	--	nS
t_r	Turn-on Rise Time		--	24	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	55	--	nS
t_f	Turn-Off Fall Time		--	8.5	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	Tj=25℃，Is=20A	--	--	1.2	V

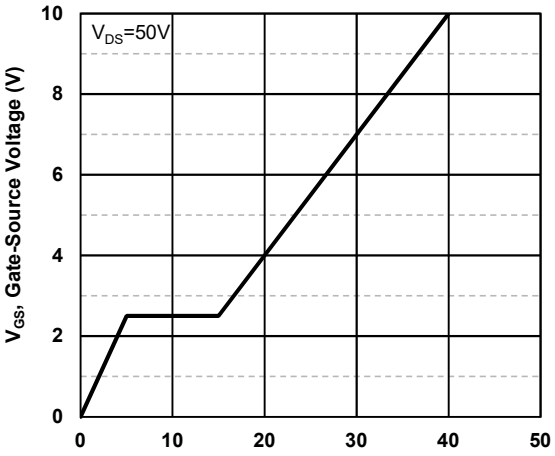
Note :

1、The test condition： V_{DD}=50V,V_{GS}=10V,L=0.5mH，R_G=25Ω,Starting Tj=25° C.

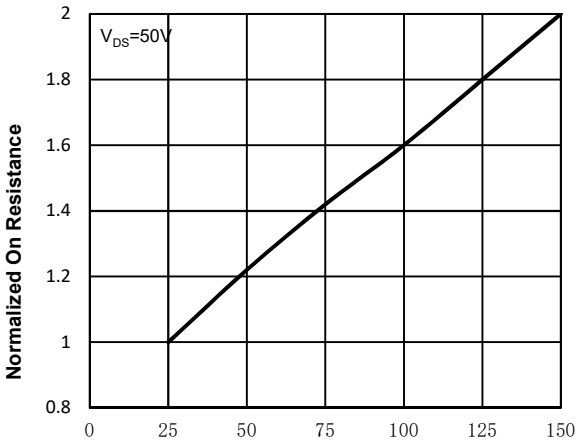
Typical Operating Characteristics



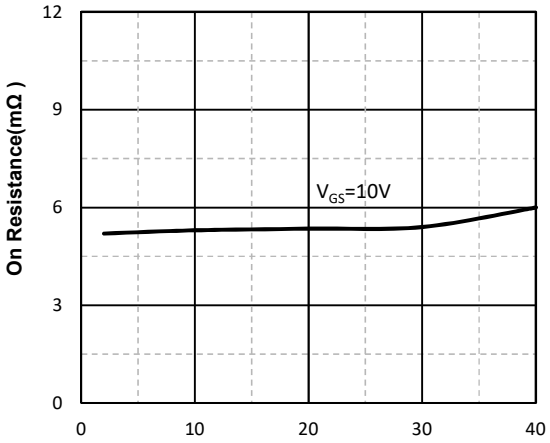
V_{DS}, Drain -Source Voltage (V)
Fig1. Typical Output Characteristics



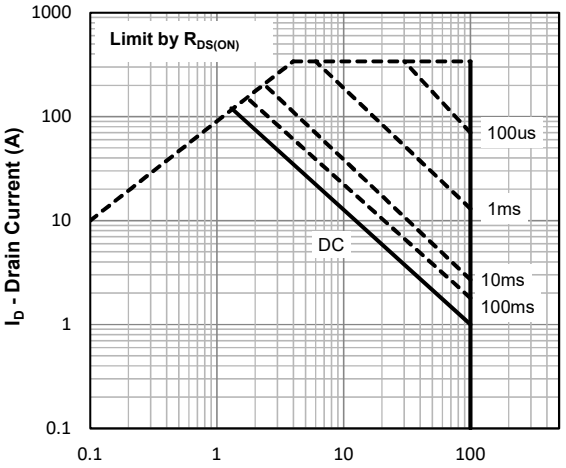
Qg -Total Gate Charge (nC)
Fig2. Typical Gate Charge Vs.Gate-Source Voltage



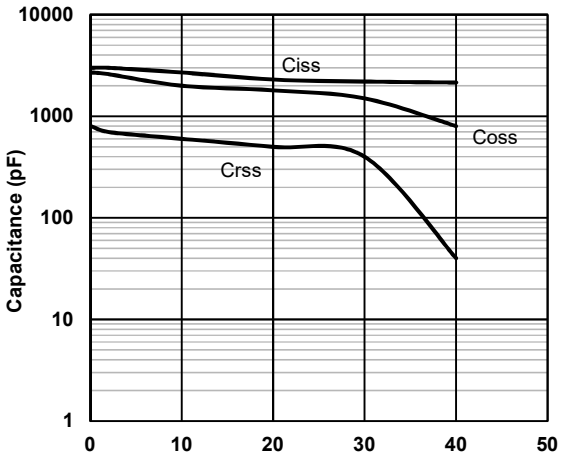
Tj - Junction Temperature (°C)
Fig3. Normalized On-Resistance Vs. Temperature



I_D, Drain-Source Current (A)
Fig4. On-Resistance Vs. Drain-Source Current

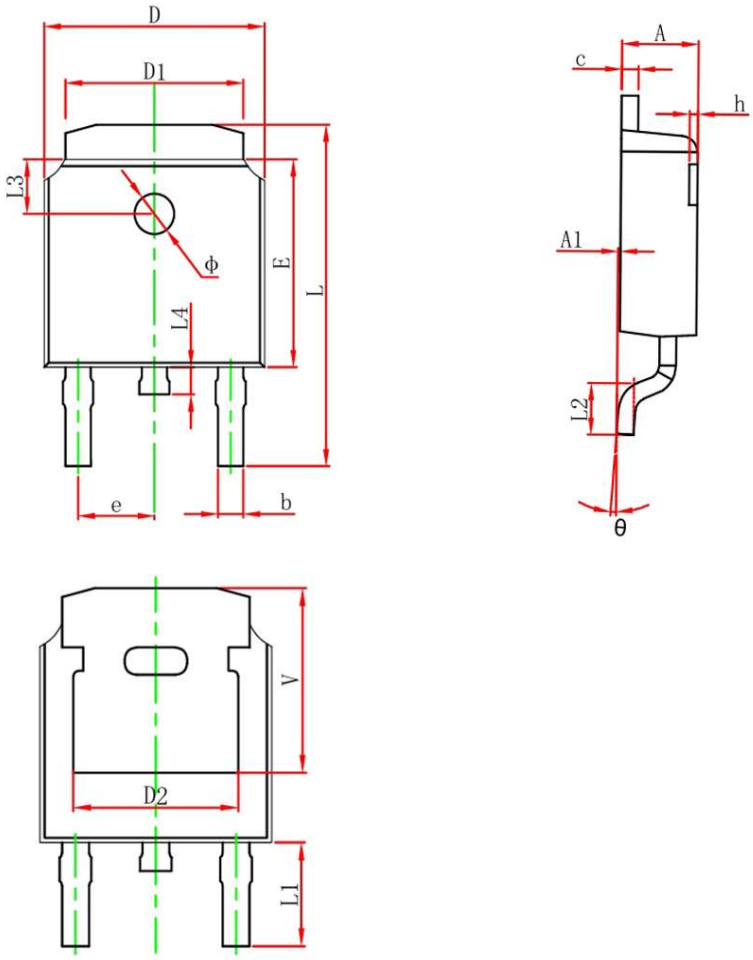


V_{DS}, Drain -Source Voltage (V)
Fig5. Maximum Safe Operating Area



V_{DS} , Drain-Source Voltage (V)
Fig6 Typical Capacitance Vs.Drain-Source Voltage

TO-252 Package information



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.450	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.386	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	