

### Features

- Low  $R_{DS(on)}$  & FOM
- Extremely low switching loss
- Split gate trench MOSFET technology
- Fast switching and soft recovery

### Application

- Consumer electronic power supply
- Motor control
- Synchronous-rectification
- Isolated DC/DC convertor

### Product Summary

$V_{DS}$	$R_{DS(on)}$ TYP	$I_D$
100V	13m $\Omega$ @10V	50A
	17m $\Omega$ @4.5V	

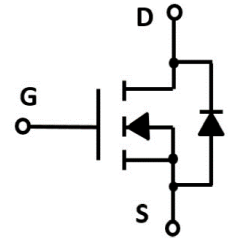


MU1A50AG: Device code  
 XXXX : Code

Marking and pin assignment



TO-252 top view



Schematic diagram



Pb-Free



RoHS



Halogen-Free

### Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Rating	Unit
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### Common Ratings (TC=25°C Unless Otherwise Noted)

$V_{DS}$	Drain-Source Breakdown Voltage	100	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$T_J$	Maximum Junction Temperature	150	$^{\circ}\text{C}$
$T_{STG}$	Storage Temperature Range	-50 to 155	$^{\circ}\text{C}$
$I_S$	Diode Continuous Forward Current	50	A

### Mounted on Large Heat Sink

$I_{DM}$	Pulse Drain Current Tested	195	A	
$I_D$	Continuous Drain Current	$T_c=25^{\circ}\text{C}$	50	A
$P_D$	Maximum Power Dissipation	$T_c=25^{\circ}\text{C}$	32	W
EAS	Single pulse Avalanche Energy <sup>Note1</sup>	16	mJ	

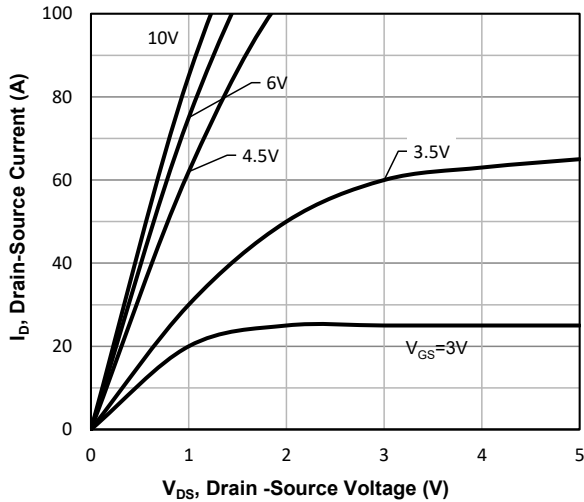
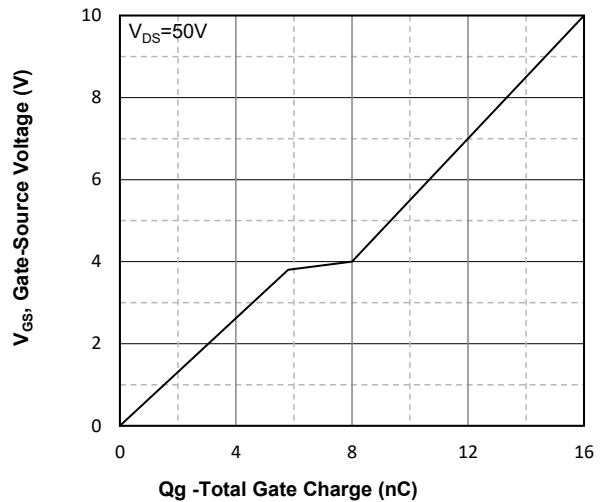
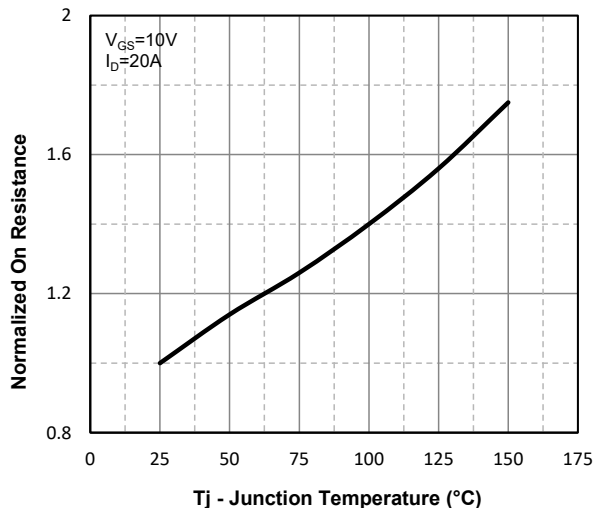
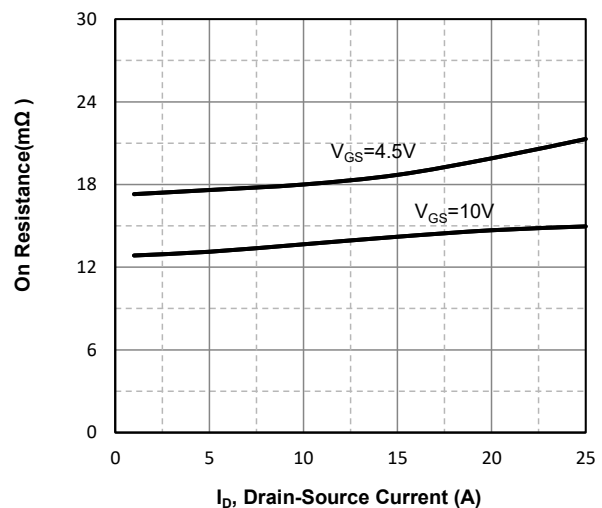
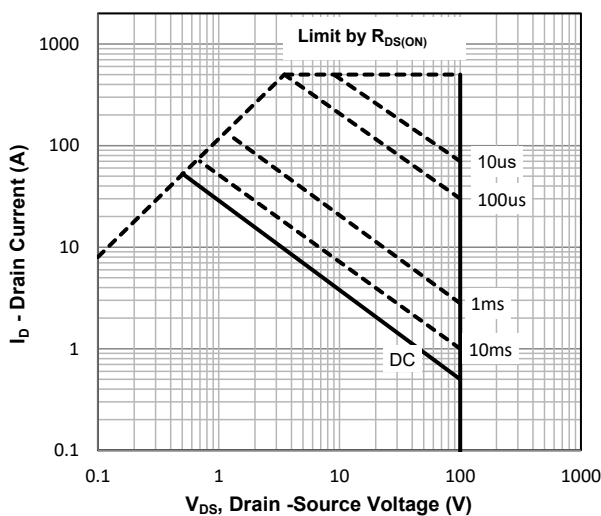
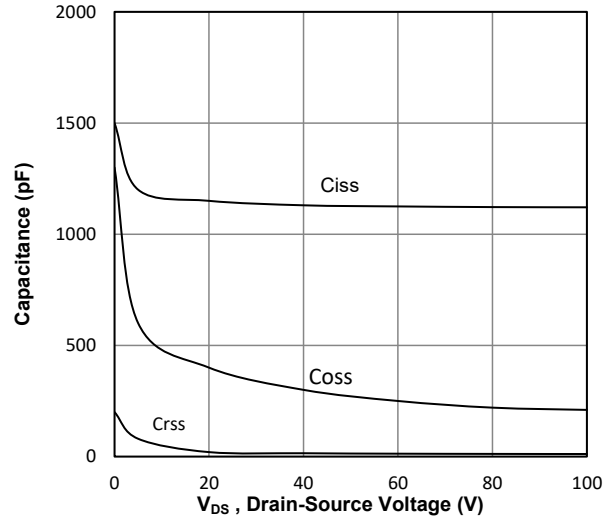
### Ordering Information (Example)

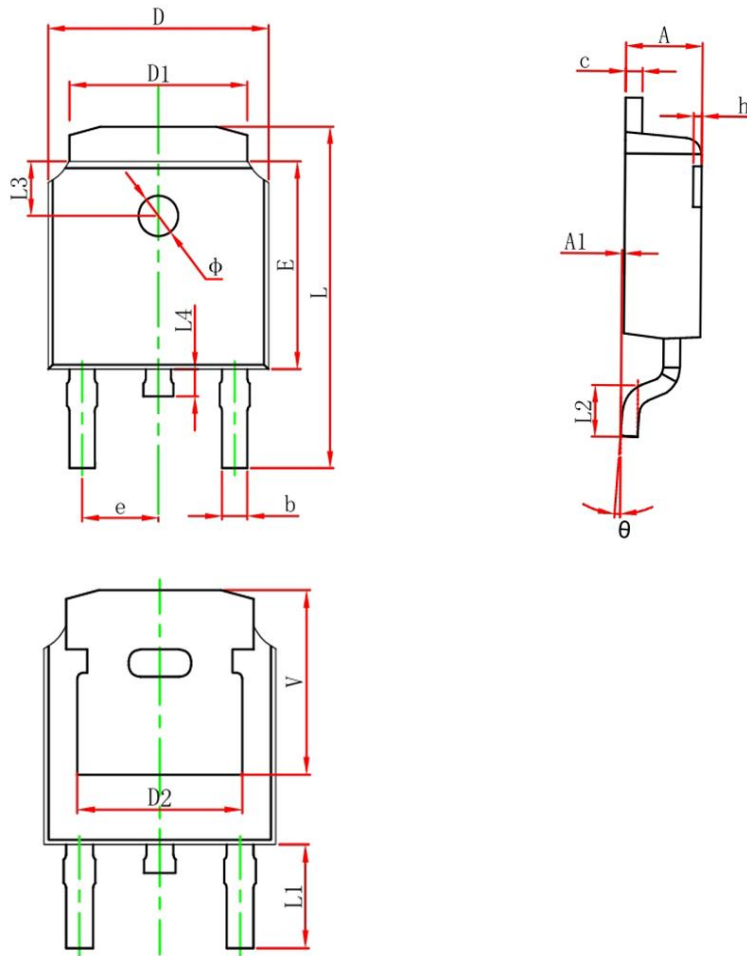
Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MU1A50AG	TO-252	MU1A50AG	2,500	5,000	35,000	13"reel

Electrical Characteristics (T <sub>J</sub> =25°C unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
BV <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	100	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V	--	--	1.0	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	--	2.5	V
R <sub>DS(on)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =25A	--	13	17	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A	--	17	21	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz	--	1130	--	pF
C <sub>OSS</sub>	Output Capacitance		--	400	--	pF
C <sub>RSS</sub>	Reverse Transfer Capacitance		--	18	--	pF
<b>Switching Characteristics</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DD</sub> =50V, I <sub>D</sub> =20A, V <sub>GS</sub> =10V	--	16	--	nC
Q <sub>gs</sub>	Gate Source Charge		--	5.5	--	nC
Q <sub>gd</sub>	Gate Drain Charge		--	2.5	--	nC
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =50V, I <sub>D</sub> =20A, V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω	--	40	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	11	--	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		--	53	--	nS
t <sub>f</sub>	Turn-Off Fall Time		--	16	--	nS
<b>Source- Drain Diode Characteristics</b>						
V <sub>SD</sub>	Forward on voltage	T <sub>J</sub> =25°C, I <sub>S</sub> =30A,	--	--	1.2	V

Note:

1. EAS condition: V<sub>DD</sub>=50V, L=0.5mH, V<sub>GS</sub>=10V, Starting T<sub>J</sub> = 25°C

**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 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
phi	1.100	1.300	0.043	0.051
theta	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	