

Features

- Trench Power LV MOSFET technology
- High density cell design for Low $R_{DS(ON)}$
- High Speed switching

Application

- Battery protection
- Load switch
- Power management



Marking and pin assignment

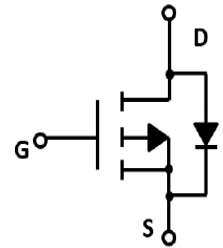
MU0D20AP: Device code
XXXX: Code

Product Summary

V_{DS}	$R_{DS(ON)}$ MAX	I_D MAX
-30V	45mΩ@-10V	-20A
	55mΩ@-4.5V	



TO-252 top view



Schematic diagram



Pb-Free



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	-30	V
V_{GS}	Gate-Source Voltage	±20	V
E_{AS}	Single pulse avalanche energy ^{Note1}	39.6	mJ
T_J, T_{STG}	Storage Temperature Range	-55 to 175	°C
I_S	Diode Continuous Forward Current	Tc=25°C -20	A

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	Tc=25°C -80	A
I_D	Continuous Drain Current	Tc=25°C -20	A
P_D	Maximum Power Dissipation	Tc=25°C 23	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	83	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MU0D20AP	TO-252	MU0D20AP	2,500	5,000	35,000	13" reel

Electrical Characteristics (TJ=25°C 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	-30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-30V, 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	-1.0	-1.5	-2.5	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-10A	--	33	45	mΩ
		V _{GS} =-4.5V, I _D =-5A	--	40	55	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	--	375	--	pF
C _{OSS}	Output Capacitance		--	63	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	47	--	pF
Q _g	Total Gate Charge	V _{DS} =-15V, I _D =-10A, V _{GS} =-10V	--	4.2	--	nC
Q _{gs}	Gate Source Charge		--	1	--	nC
Q _{gd}	Gate Drain Charge		--	1.3	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =-15V, I _D =-10A, V _{GS} =-10V, R _G =2.5Ω	--	14	--	nS
t _r	Turn-on Rise Time		--	61	--	nS
t _{d(off)}	Turn-Off Delay Time		--	19	--	nS
t _f	Turn-Off Fall Time		--	10	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	Tj=25°C, Is=-10A	--	--	-1.2	V

Note:

- 1、EAS Test condition: V_{DD}=-30V, V_{GS}=-10V, L=0.5mH, I_D=-12.6A, R_G=25Ω, Starting T_J = 25℃

Typical Operating Characteristics

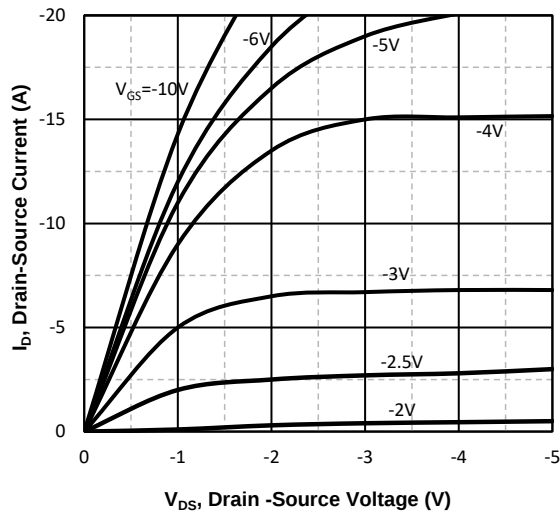


Fig1. Typical Output Characteristics

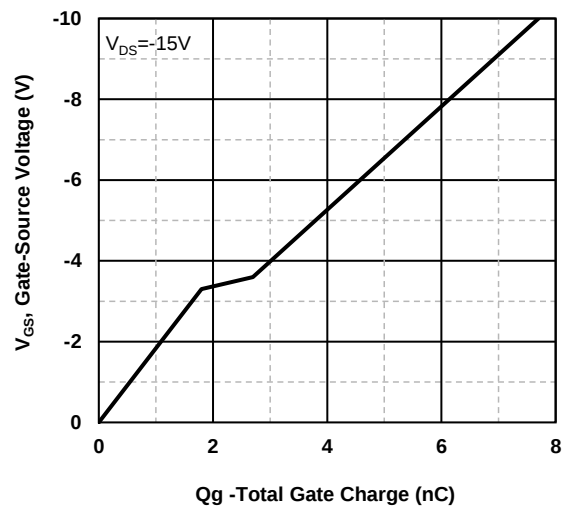


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

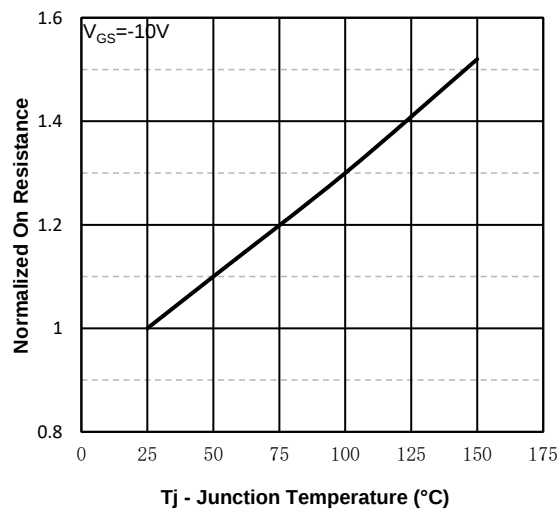


Fig3. Normalized On-Resistance Vs. Temperature

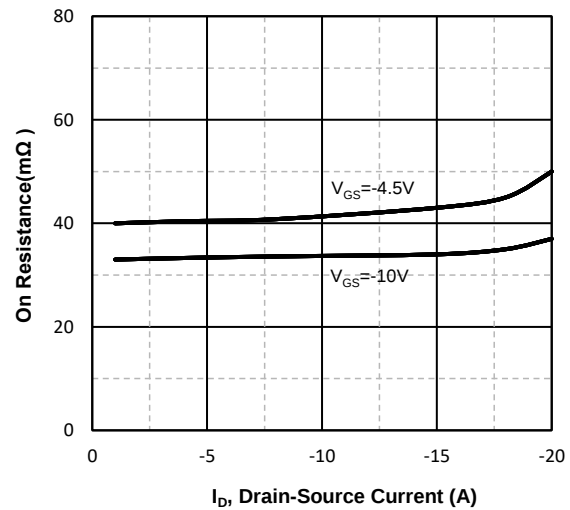


Fig4. On-Resistance Vs. Drain-Source Current

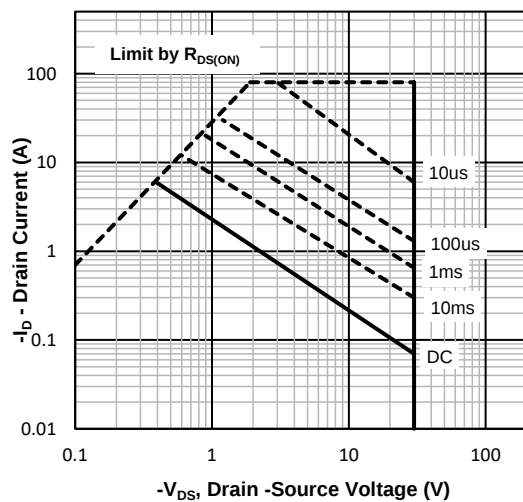


Fig5. Maximum Safe Operating Area

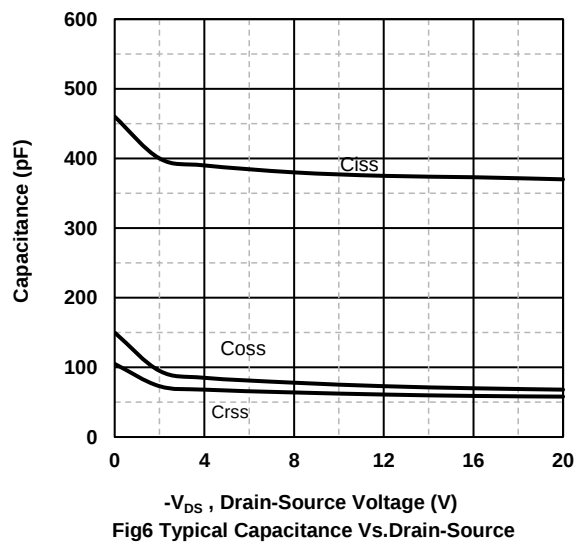
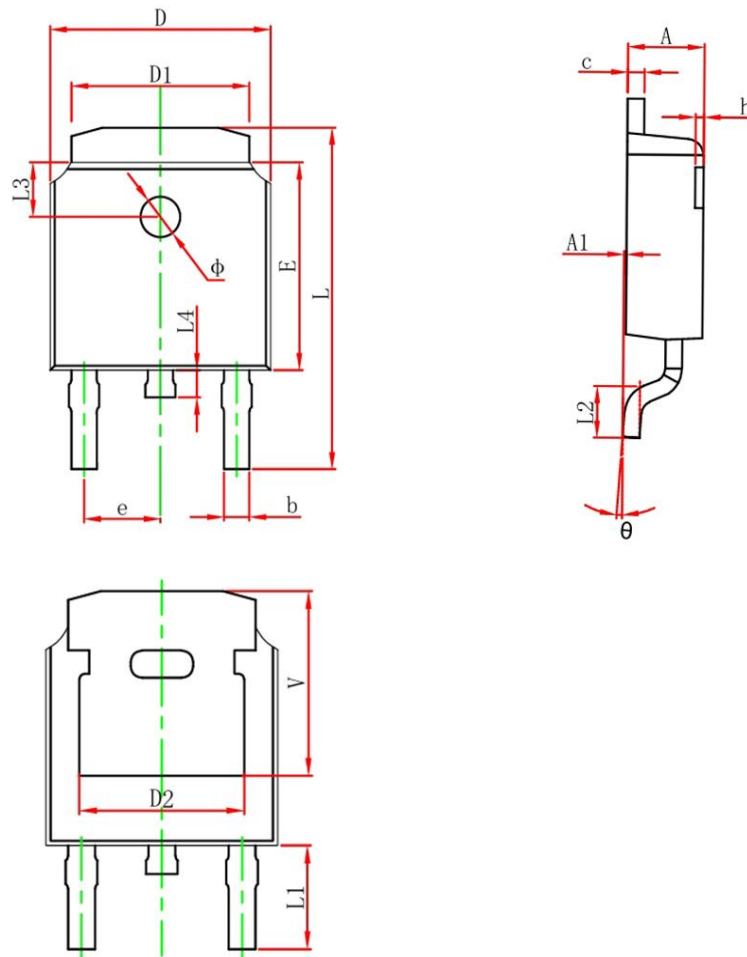


Fig6. Typical Capacitance Vs. Drain-Source

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.	