

MJ N-Channel Enhancement Mode Power MOSFET

Description

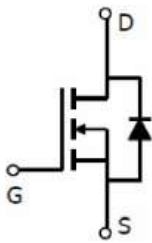
The MJ0110AS uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

General Features

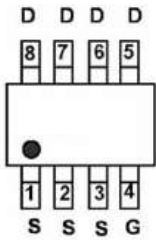
- ◆ $V_{DS} = 100V, I_D = 10A$
 $R_{DS(ON)} < 17m\Omega$ @ $V_{GS} = 10V$ (Typ: 14m Ω)
 $R_{DS(ON)} < 20m\Omega$ @ $V_{GS} = 4.5V$ (Typ: 15.2m Ω)
- ◆ Special process technology for high ESD capability
- ◆ High density cell design for ultra low R_{dson}
- ◆ Fully characterized avalanche voltage and current

Application

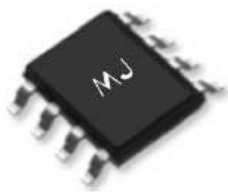
- ◆ DC/DC Primary Side Switch
- ◆ Telecom/Server
- ◆ Synchronous Rectification



Schematic diagram



Marking and pin assignment



SOP-8 top view

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
MJ0110AS	MJ0110AS	SOP-8	Ø330mm	12mm	4000 units

Absolute Maximum Ratings ($T_A = 25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	10	A
Drain Current-Continuous($T_C = 100^{\circ}C$)	$I_{D(100^{\circ}C)}$	7	A
Pulsed Drain Current	I_{DM}	70	A
Maximum Power Dissipation	P_D	3.1	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^{\circ}C$

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	40	$^{\circ}C/W$
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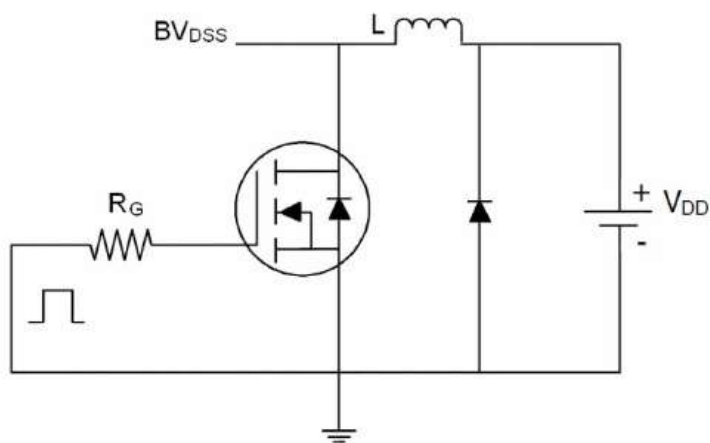
Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	100	110	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V,V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{DS} =±20V,V _{DS} =0V	-	-	±100	nA
On Characteristics <small>(Note 3)</small>						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =250μA	0.9	1.3	1.8	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =10A	-	14	17	mΩ
		V _{GS} =4.5V, I _D =10A	-	15.2	20	mΩ
Forward Transconductance	g _{FS}	V _{DS} =10V,I _D =10A	-	26	-	S
Dynamic Characteristics <small>(Note 4)</small>						
Input Capacitance	C _{iss}	V _{DS} =50V,V _{GS} =0V F=1.0MHz	3000	3835	4200	PF
Output Capacitance	C _{Oss}		-	178	-	PF
Reverse Transfer Capacitance	C _{rss}		-	153	-	PF
Switching Characteristics <small>(Note 4)</small>						
Turn-on Delay Time	t _{d(on)}	V _{DD} =50V,I _D =10A,R _L =5Ω R _G =1Ω,V _{GS} =10V	-	13	-	nS
Turn-on Rise Time	t _r		-	14	-	nS
Turn-Off Delay Time	t _{d(off)}		-	25	-	nS
Turn-Off Fall Time	t _f		-	10	-	nS
Total Gate Charge	Q _g	I _D =10A,V _{DD} =50V V _{GS} =10V	-	90	-	nC
Gate-Source Charge	Q _{gs}		-	10	-	nC
Gate-Drain Charge	Q _{gd}		-	24	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage <small>(Note 3)</small>	V _{SD}	V _{GS} =0V,I _S =10A	-	0.85	1.2	V
Diode Forward Current <small>(Note 2)</small>	I _S		-	-	10	A
Reverse Recovery Time	t _{rr}	T _J =25°C, I _F =10A di/dt= 100A/μs <small>(Note 3)</small>	-	33	-	nS
Reverse Recovery Charge	Q _{rr}		-	54	-	nC

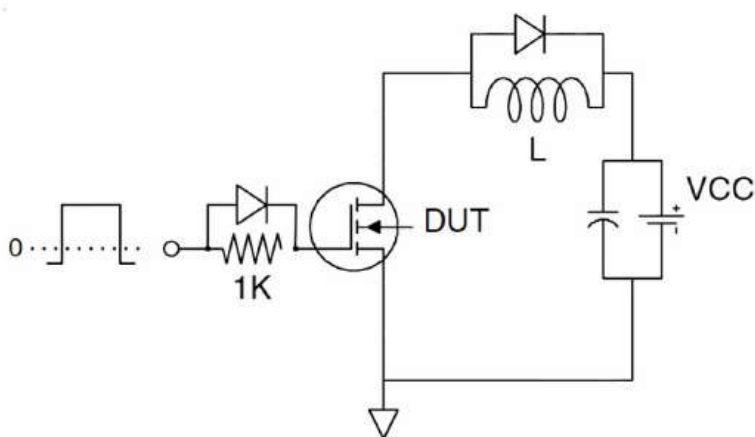
Notes:

- ① Repetitive Rating: Pulse width limited by maximum junction temperature.
- ② Surface Mounted on FR4 Board, t ≤ 10 sec.
- ③ Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- ④ Guaranteed by design, not subject to production

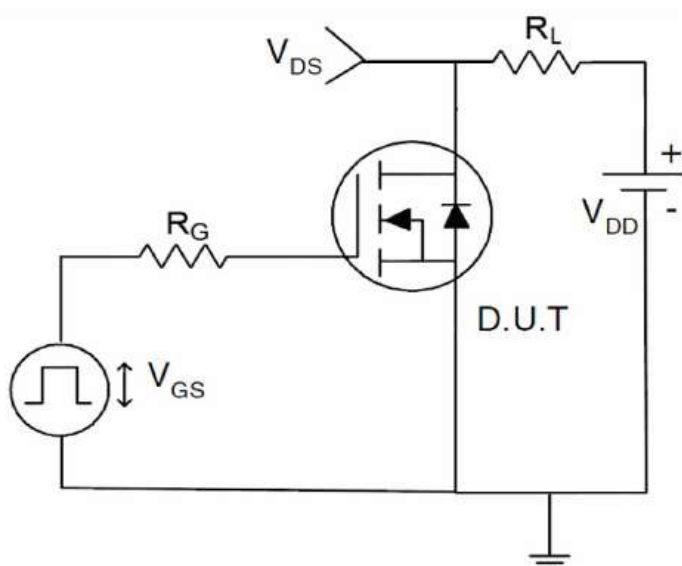
Test circuit



EAS test Circuit

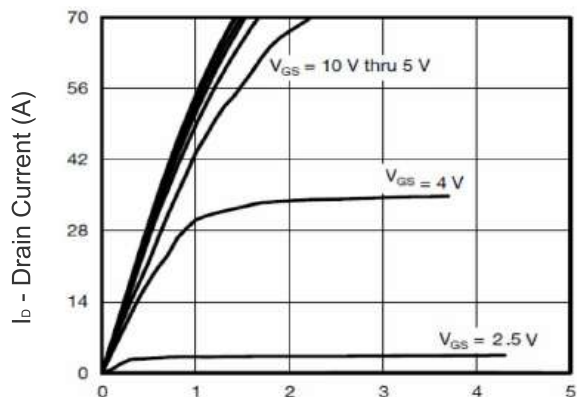


Gate charge test Circuit

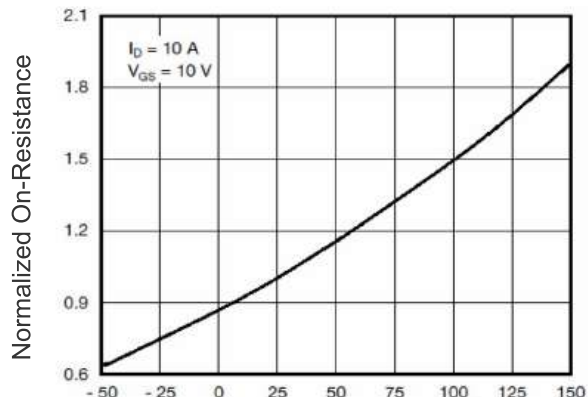


Switch Time Test Circuit

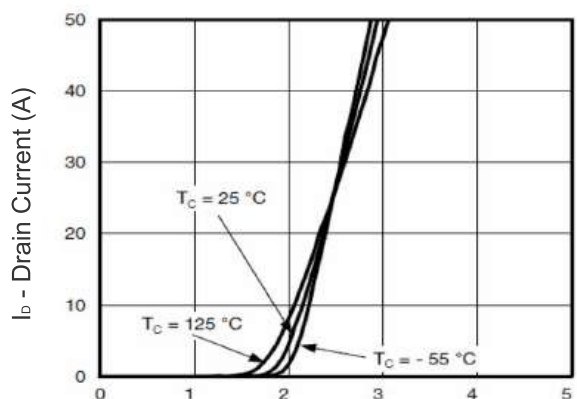
Typical Electrical and Thermal Characteristics (Curves)



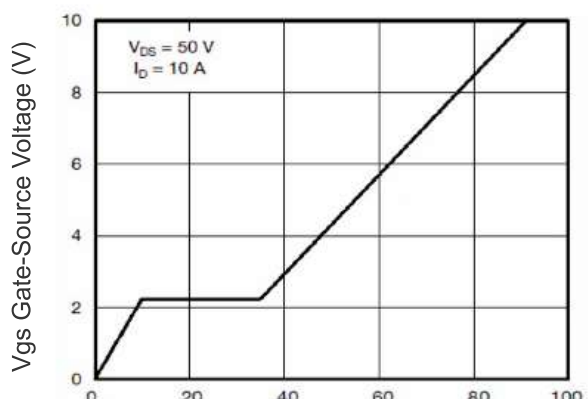
V_{DS} Drain-Source Voltage (V)
Figure 1 Output Characteristics



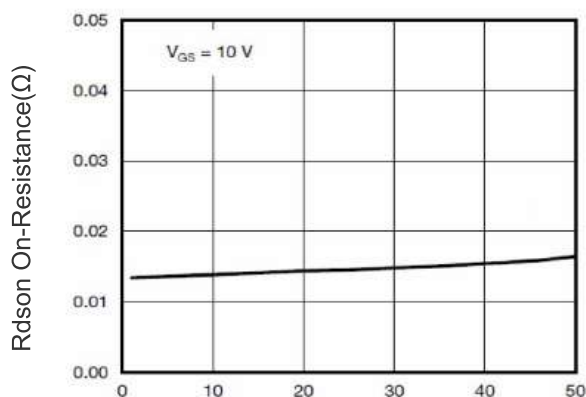
T_J -Junction Temperature(°C)
Figure 4 Rdson-Junction Temperature



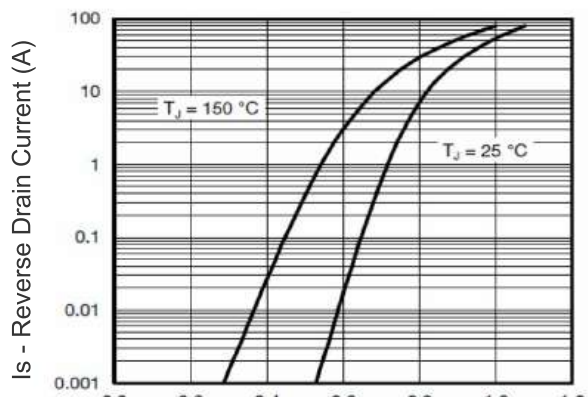
V_{GS} Gate-Source Voltage (V)
Figure 2 Transfer Characteristics



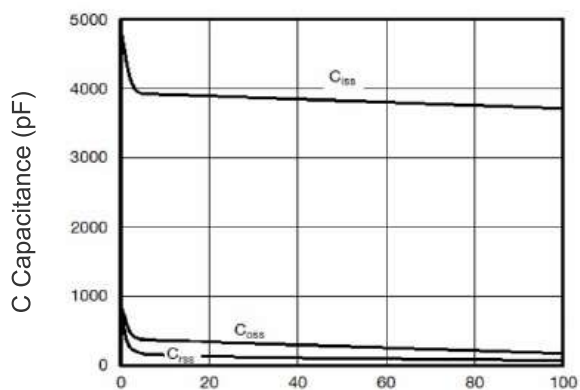
Q_g Gate Charge (nC)
Figure 5 Gate Charge



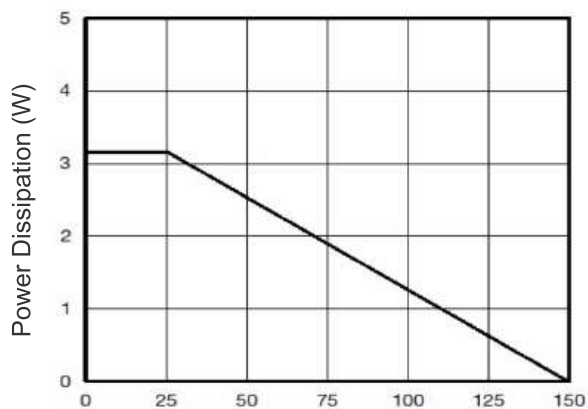
I_D - Drain Current (A)
Figure 3 Rdson- Drain Current



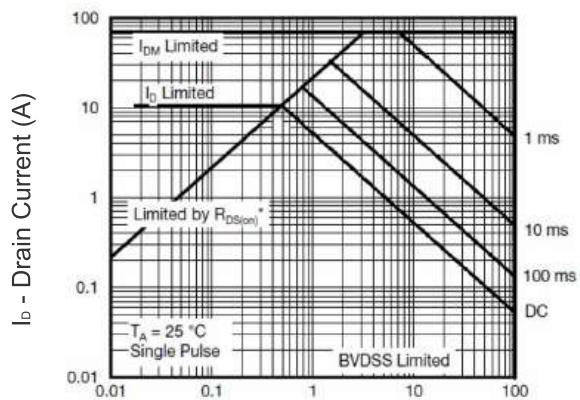
V_{SD} Source-Drain Voltage (V)
Figure 6 Source- Drain Diode Forward



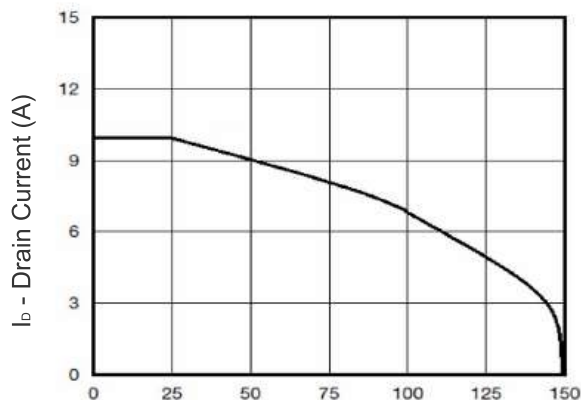
Vds Drain-Source Voltage (V)
Figure 7 Capacitance vs Vds



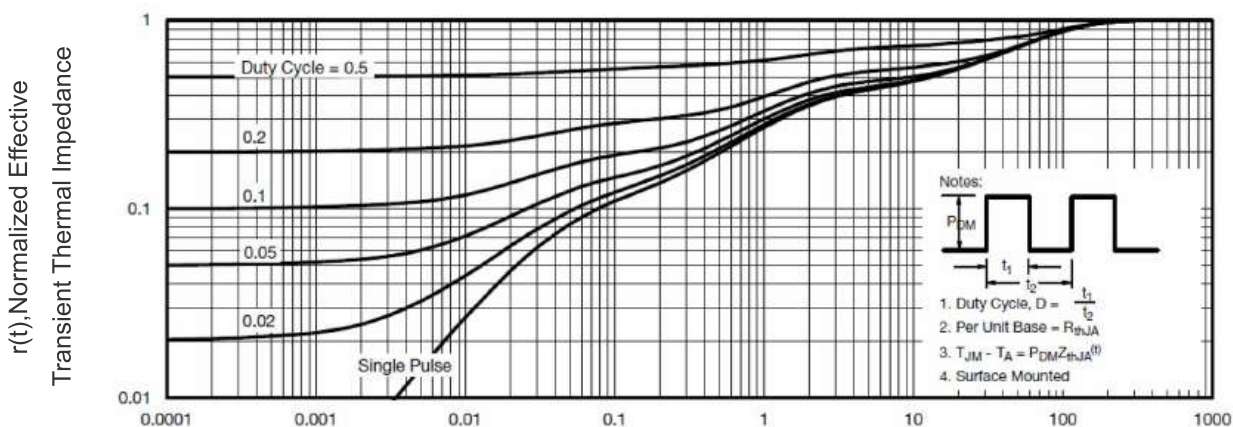
TJ -Junction Temperature(°C)
Figure 9 Power De-rating



Vds Drain-Source Voltage (V)
Figure 8 Safe Operation Area

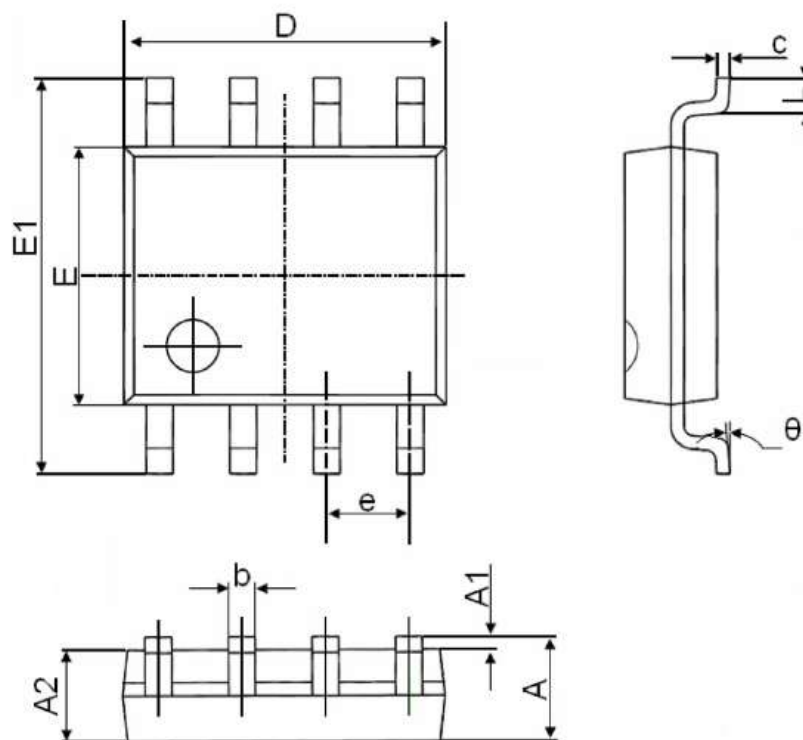


TJ -Junction Temperature(°C)
Figure 10 Current De-rating



Square Wave Pluse Duration(sec)
Figure 11 Normalized Maximum Transient Thermal Impedance

SOP-8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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