MJ N-Channel Enhancement Mode Power MOSFET

Description

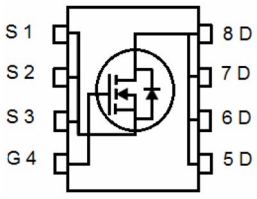
The MJ8060CG uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

General Features

- V_{DS}=80V,I_D=60A
  $R_{DS(ON)}$ =9mΩ (typical) @ V_{GS} =10V
- High density cell design for ultra low Rdson
- Very low on-resistance $R_{DS(on)}$
- Good stability and uniformity with high E_{AS}
- 150 °C operating temperature
- Pb-free lead plating

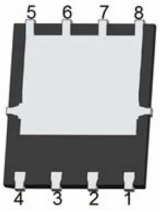
Application

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



Schematic Diagram

Top View



Bottom View

100% UIS TESTED! 100% ΔVds TESTED!

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
MJ8060CG	MJ8060CG	DFN 5x6-8L	-	-	-

Absolute Maximum Ratings (T_A =25 ℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	80	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	60	A
Drain Current-Continuous(T_C =100℃)	$I_{D(100℃)}$	42.4	A
Pulsed Drain Current	I_{DM}	240	A
Maximum Power Dissipation	P_D	85	W
Single pulse avalanche energy (Note 5)	E_{AS}	380	mJ
Derating factor		0.68	W/℃
Operating Junction and Storage Temperature Range	T_J ,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case (Note 2)	$R_{\theta JC}$	1.5	℃/W

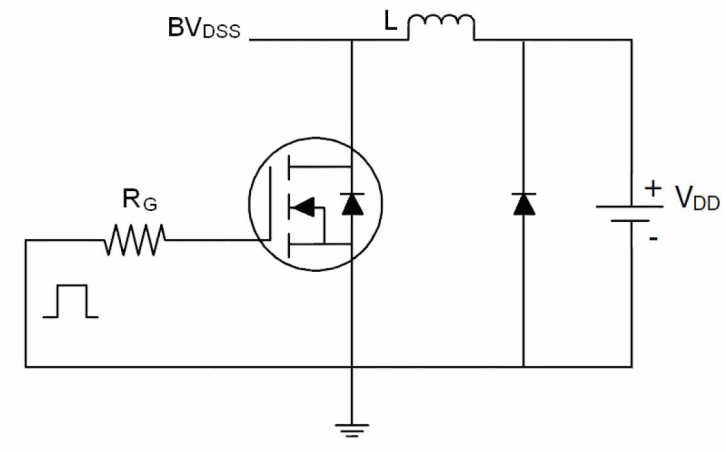
Electrical Characteristics (T_A =25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	80	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=80V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{DS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} ,I_D=250μA	2	3	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A	-	9	12	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=20A	-	30	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C_{lss}	V_{DS}=25V,V_{GS}=0V, F=1.0MHz	-	4414	-	PF
Output Capacitance	C_{oss}		-	219	-	PF
Reverse Transfer Capacitance	C_{rss}		-	188	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=40V,R_L=15Ω V_{GS}=10V,R_G=2.5Ω	-	19	-	nS
Turn-on Rise Time	t_r		-	12	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	40	-	nS
Turn-Off Fall Time	t_f		-	15	-	nS
Total Gate Charge	Q_g	V_{DS}=40V,I_D=20A, V_{GS}=10V	-	81.5	-	nC
Gate-Source Charge	Q_{gs}		-	26.9	-	nC
Gate-Drain Charge	Q_{gd}		-	23.7	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=20A	-	-	1.2	V
Diode Forward Current (Note 2)	I_S		-	-	60	A
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=20A di/dt=100A/μs (Note 3)	-	36	-	nS
Reverse Recovery Charge	Q_{rr}		-	54	-	nC

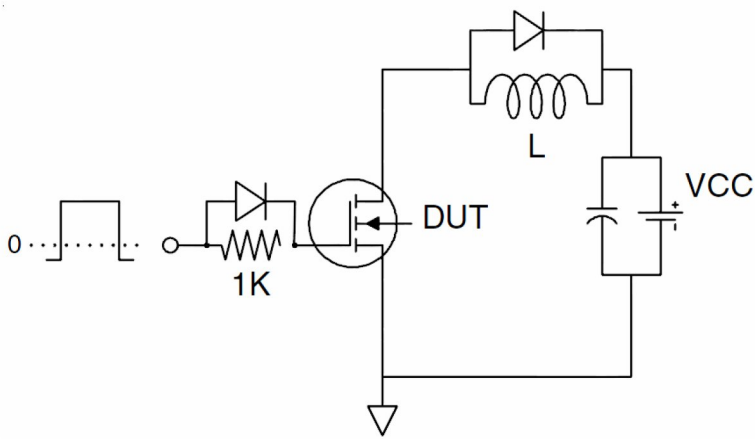
Notes:

① Repetitive Rating: Pulse width limited by maximum junction temperature.
② Surface Mounted on FR4 Board, t≤10sec.
③ Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.
④ Guaranteed by design, not subject to production
⑤ EAS condition：Tj=25℃,V_{DD}=40V,V_G=10V,L=0.5mH,Rg=25Ω

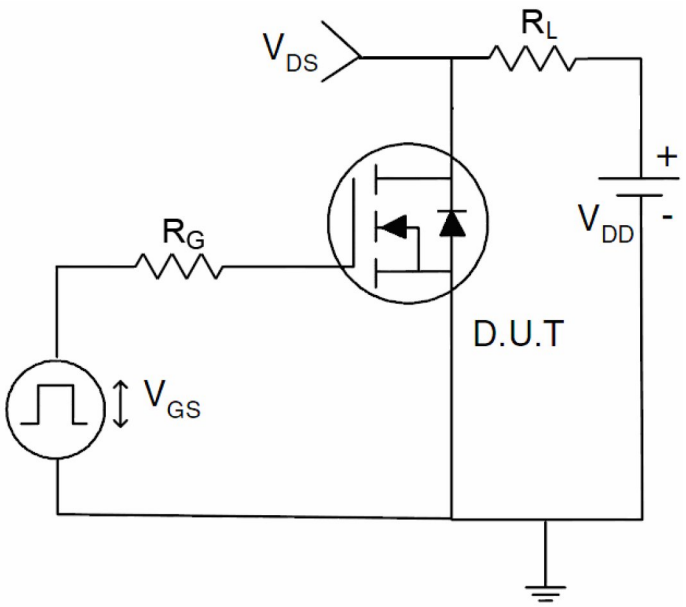
Test Circuit



EAS test Circuit



Gate charge test Circuit



Switch Time Test Circuit

Typical Electrical and Thermal Characteristics (Curves)

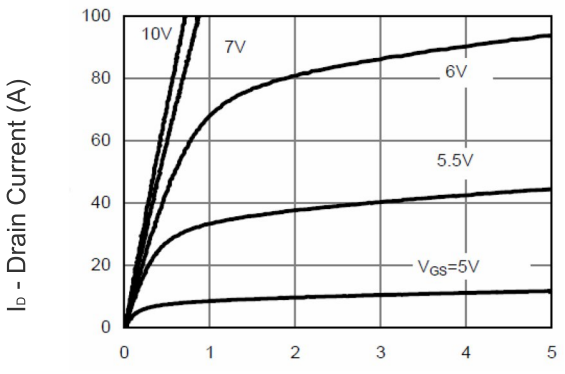


Figure 1 Output Characteristics

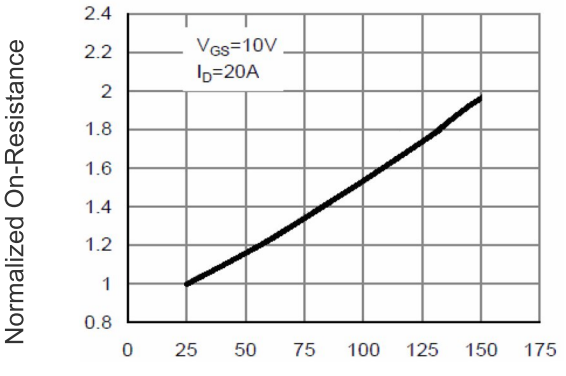


Figure 4 Rdson-JunctionTemperature

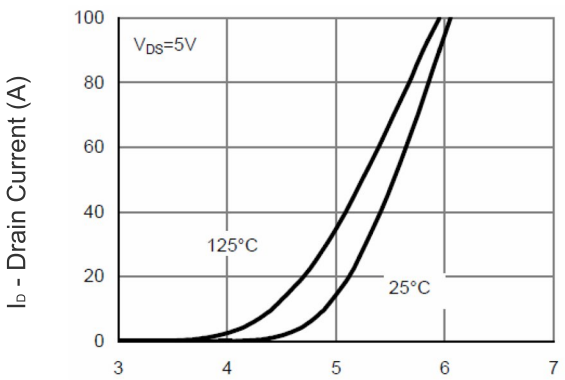


Figure 2 Transfer Characteristics

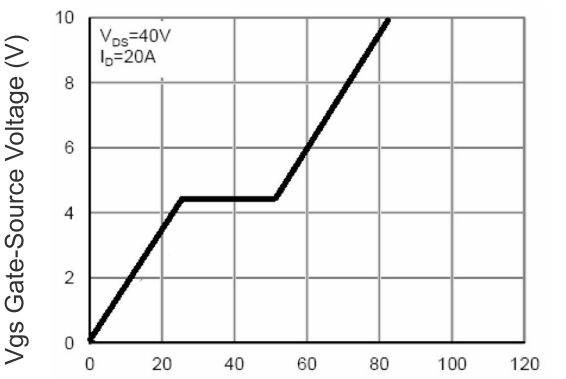


Figure 5 Gate Charge

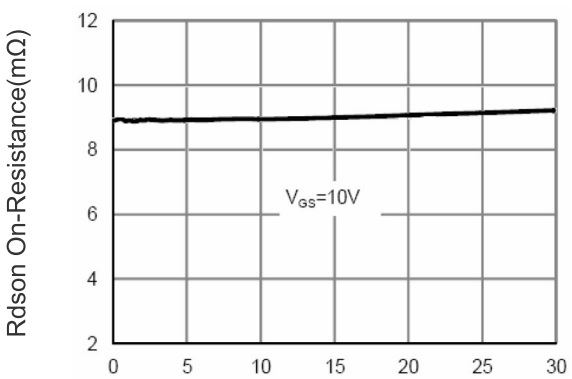


Figure 3 Rdson- Drain Current

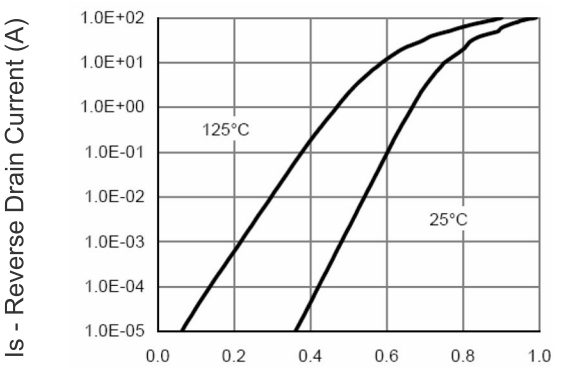


Figure 6 Source- Drain Diode Forward

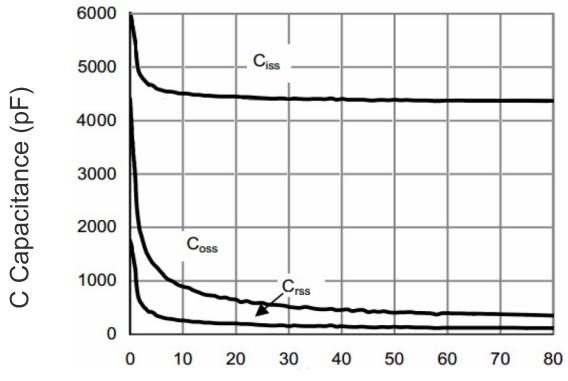


Figure 7 Capacitance vs Vds

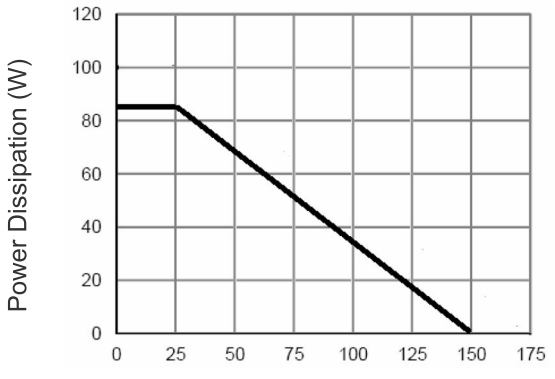


Figure 9 Power De-rating

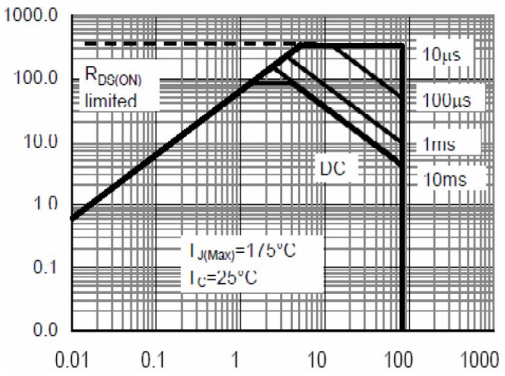


Figure 8 Safe Operation Area

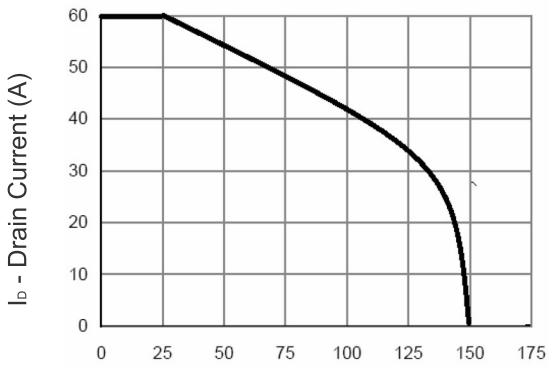


Figure 10 I_D Current De-rating

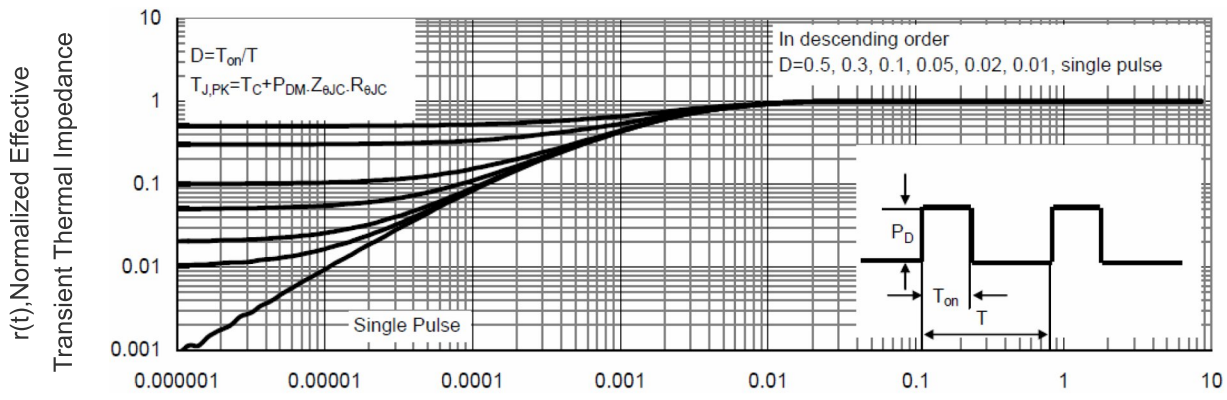
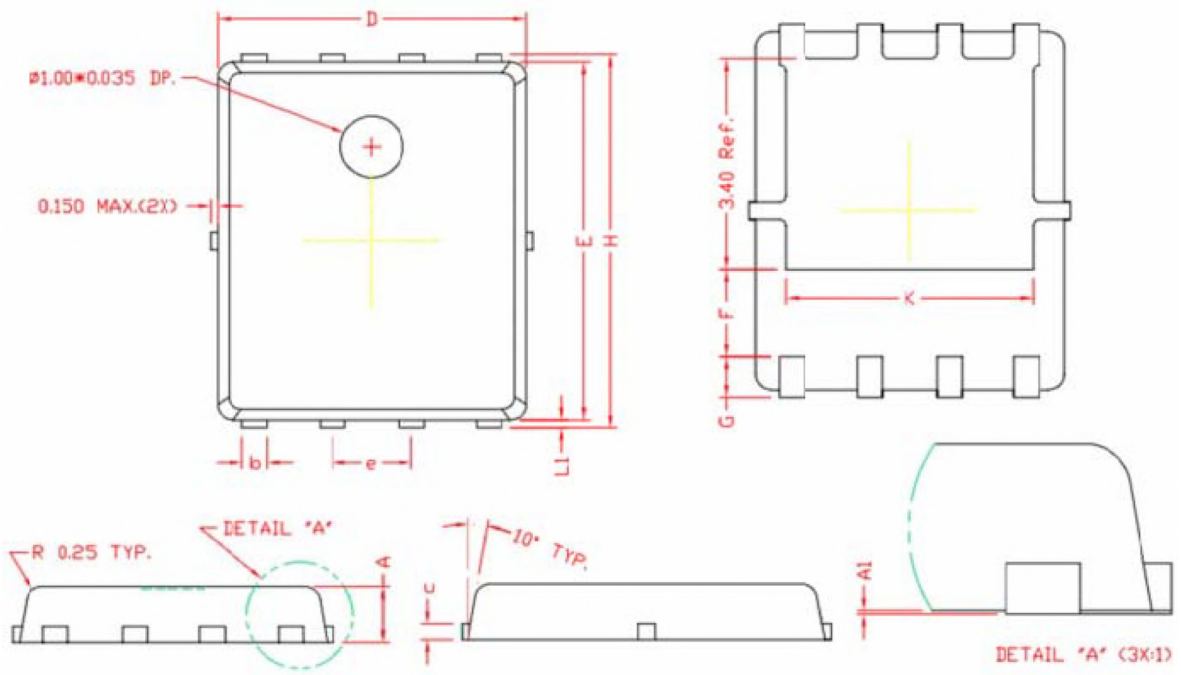


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-252-2L Package Information



COMMON DIMENSIONS

(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.80	0.90	1.00
A1	0.00	0.03	0.05
b	0.35	0.42	0.49
c		0.254 REF.	
D	4.90	5.00	5.10
F		1.40 REF.	
E	5.70	5.80	5.90
e		1.27 BSC.	
H	5.95	6.08	6.20
L1	0.10	0.14	0.18
G		0.60 REF.	
K		4.00 REF.	

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