N-Channel Enhancement Mode Power MOSFET

Description

The G080N10M uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

- V_{DS} 100V
- I_D (at V_{GS} = 10V)   140A
- $R_{DS(ON)}$ (at V_{GS} = 10V)   <   7.5mΩ
- $R_{DS(ON)}$ (at V_{GS} = 4.5V)   <   8mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters
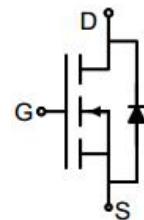
Schematic diagram
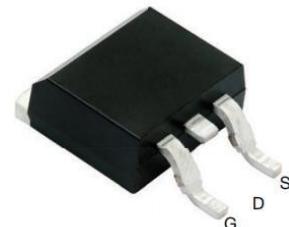
TO-263

Ordering Information

Device	Package	Marking	Packaging
G080N10M	TO-263	G080N10	800pcs/Reel

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Continuous Drain Current	I_D	140	A
Pulsed Drain Current (note1)	I_{DM}	560	A
Gate-Source Voltage	V_{GS}	±20	V
Power Dissipation	P_D	236	W
Single pulse avalanche energy （note2）	E_{AS}	361	mJ
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	ºC

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62	ºC/W
Maximum Junction-to-Case	R_{thJC}	0.53	ºC/W

Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100V, V_{GS} = 0V	--	--	1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = $\pm$20V	--	--	$\pm$100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.7	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 30A	--	5.6	7.5	mΩ
		V_{GS} = 4.5V, I_D = 30A	--	6.2	8.0	
Forward Transconductance	g_{FS}	V_{GS} = 5V, I_D = 30A	--	59	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 1.0MHz	--	13950	--	pF
Output Capacitance	C_{oss}		--	432	--	
Reverse Transfer Capacitance	C_{rss}		--	362	--	
Total Gate Charge	Q_g	V_{DD} = 50V, I_D = 30A, V_{GS} = 10V	--	192	--	nC
Gate-Source Charge	Q_{gs}		--	49	--	
Gate-Drain Charge	Q_{gd}		--	23	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 50V, I_D = 30A, R_G = 4.7Ω	--	32	--	ns
Turn-on Rise Time	t_r		--	118	--	
Turn-off Delay Time	$t_{d(off)}$		--	80	--	
Turn-off Fall Time	t_f		--	27	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	140	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 30A, V_{GS} = 0V	--	--	1.2	V
Reverse Recovery Charge	Qrr	I_F = 30A, V_{GS} = 0V di/dt=100A/us	--	212	--	nC
Reverse Recovery Time	Trr		--	96	--	ns

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature

2. EAS condition : Tj=25℃ ,VDD=50V,VGS=10V,L=0.5mH,Rg=25Ω

3. Identical low side and high side switch with identical R_G

Gate Charge Test Circuit
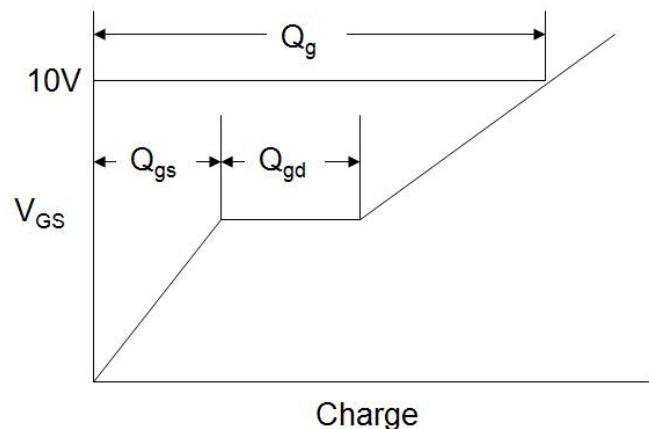
Switch Time Test Circuit

EAS Test Circuit
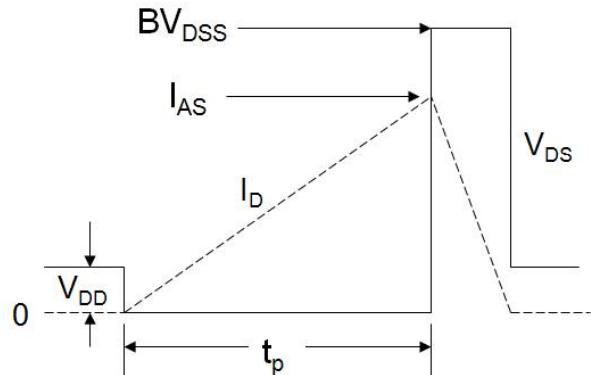
Typical Characteristics T_J = 25ºC, unless otherwise noted

### Figure 1. Output Characteristics
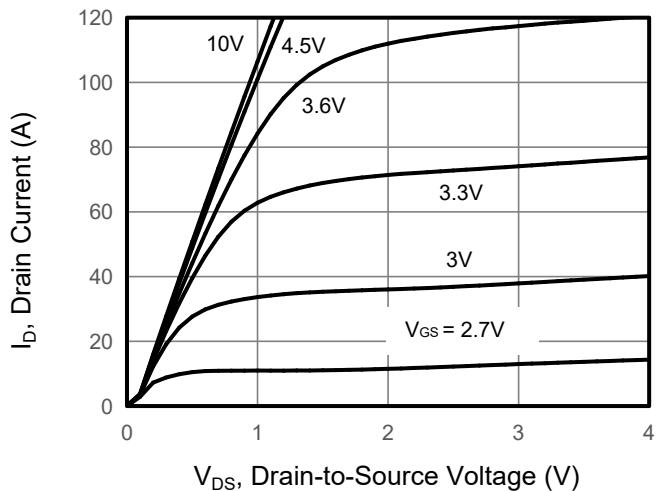

Figure 2. Transfer Characteristics
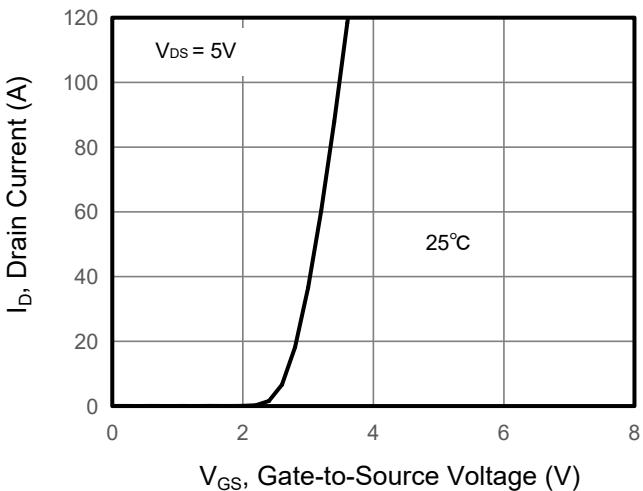

Figure 3. Drain Source On Resistance
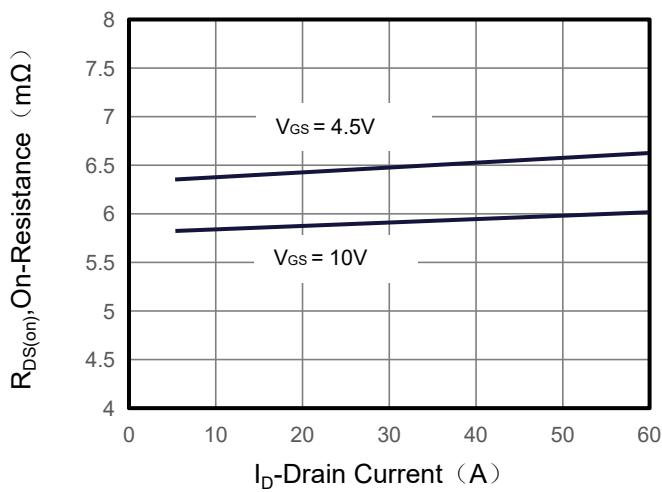

### Figure 4. Gate Charge
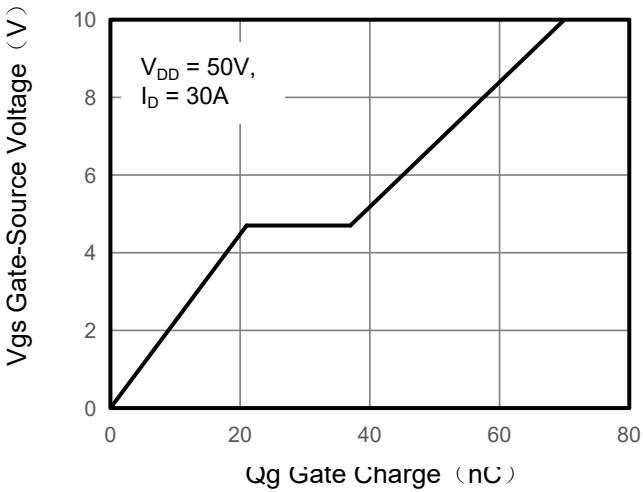
Figure 5. Capacitance
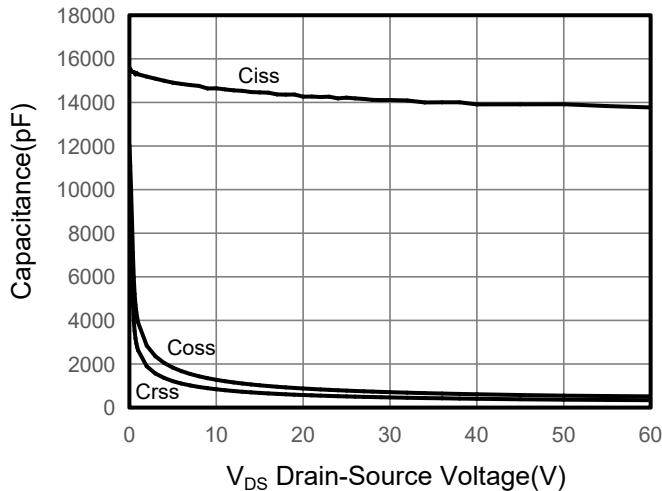
Figure 6. Source-Drain Diode Forward
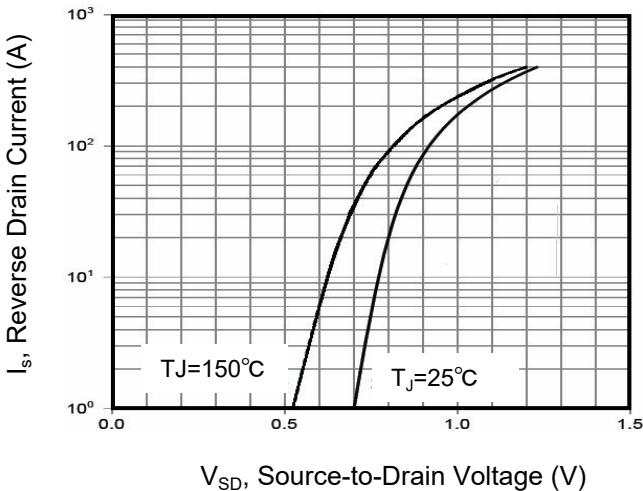
Typical Characteristics T_J = 25**º**C, unless otherwise noted

Figure 7. Drain-Source On-Resistance

V_{GS} = 10V,
I_D = 30A

$R_{DS(on)}$, (Normalized)

T_J, Junction Temperature (ºC)
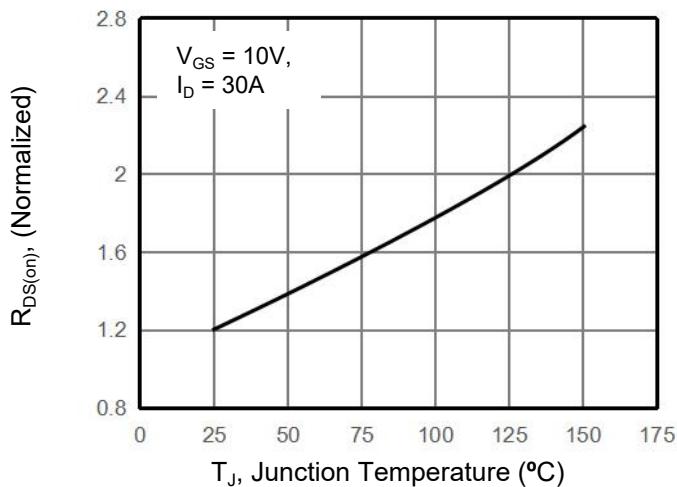
Figure 8. Safe Operation Area

1 μs
10 μs
100 μs
1 ms
10 ms
DC

$T_{J(MAX)}$=150℃
T_C=25℃

I_D, Drain Current(A)

V_{DS}, Drain-Source Voltage(V)
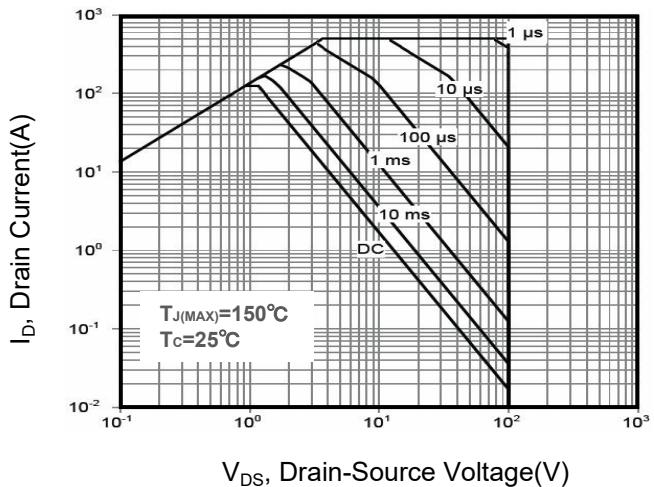
Figure 9. Normalized Maximum Transient Thermal Impedance

$D=T_{on}/T$
$T_{J,PK}=T_C+P_{DM} \cdot Z_{\theta JC} \cdot R_{\theta JC}$

$R_{\theta JC}$= 0.53°C/W

In descending order
D=0.5, 0.3, 0.1, 0.05, 0.02, 0.01, single pulse

Single Pulse

P_D

T_{on}

T

Z_{thJC}, Thermal Impedance (°C/W)

Pulse Width (s)
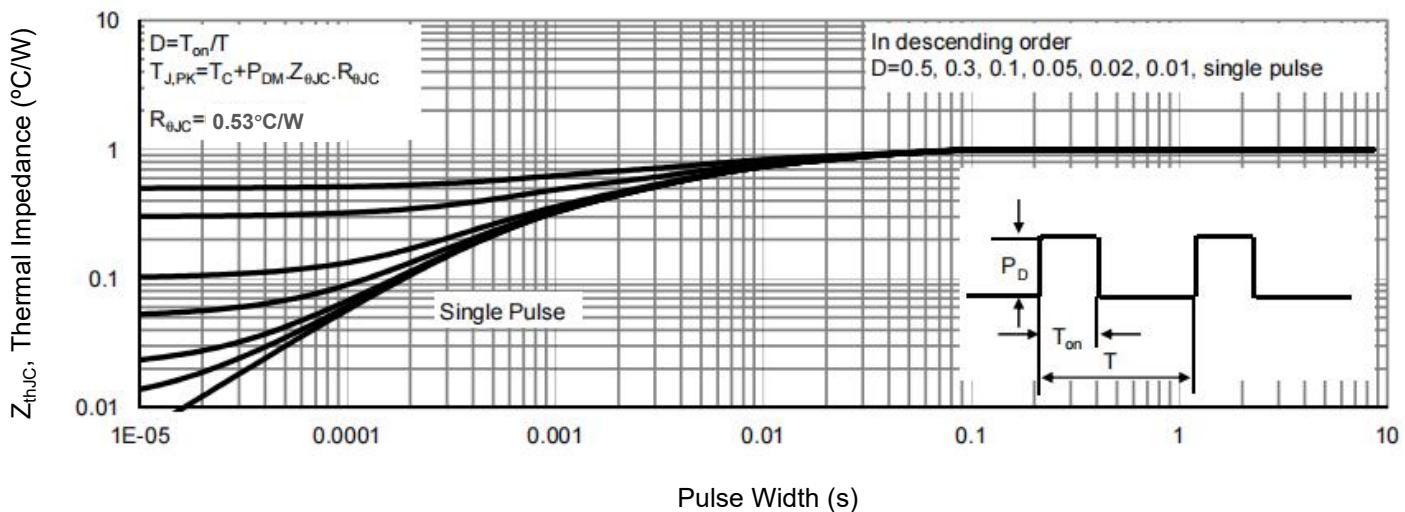
TO-263 Package Information
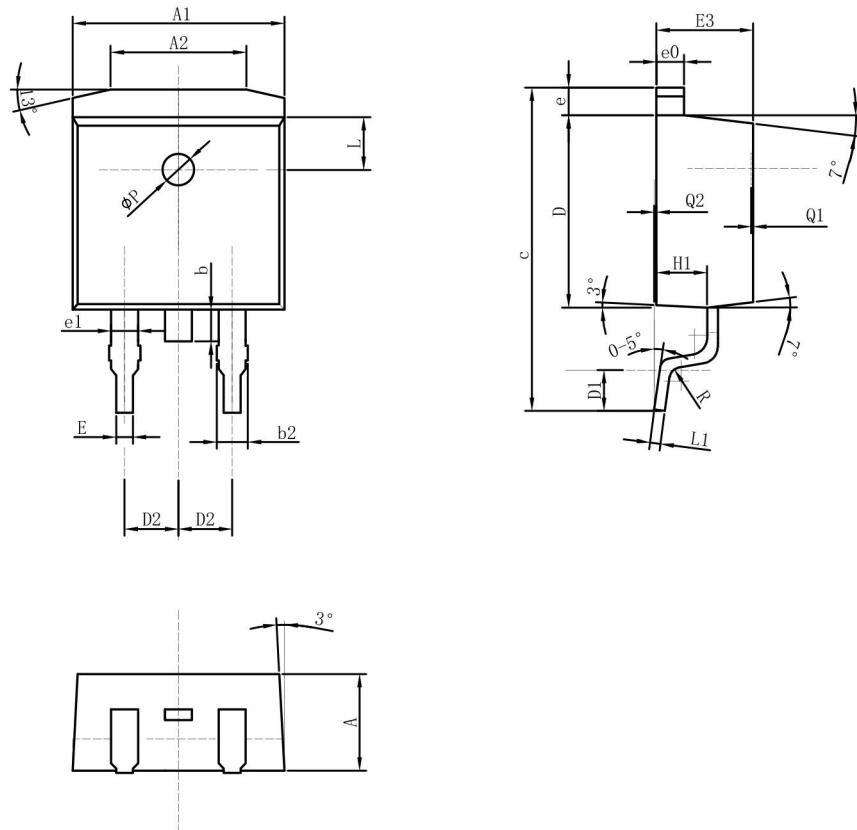
COMMON DIMENSIONS

SYMBO	mm		
	MIN	NOM	MAX
A	4.52	4.57	4.62
A1	9.95	10.00	10.05
A2	6.30	6.40	6.50
b	1.30	1.50	1.70
b2	1.17	1.27	1.37
c	14.80	15.00	15.20
D	9.05	9.10	9.15
D1	1.90	2.10	2.30
D2	–	2.54	–
E	–	0.80	–
E3	–	4.57	–
e	–	1.30	–
e0	–	1.30	–
e1	1.73	3	–
H1	–	2.40	–
L	–	2.50	–
L1	–	0.50	–
ϕP	–	1.50	–
R	–	0.50	–
Q1	0.10	–	0.15
Q2	0	–	0.02