

Description

The G10N10A 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

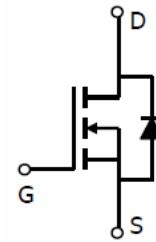
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V_{DSS}	$R_{DS(ON)}$ @10V (typ)	$R_{DS(ON)}$ @ 4.5V (typ)	I_D
100V	16m Ω	18m Ω	10A

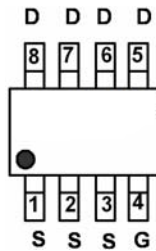
- Special process technology for high ESD capability
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current

Application

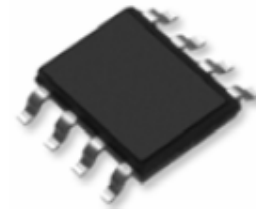
- DC/DC Primary Side Switch
- Telecom/Server
- Synchronous Rectification



Schematic diagram



Marking and pin assignment



SOP-8

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ 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($T_C=100^\circ\text{C}$)	$I_D(100^\circ\text{C})$	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	$^\circ\text{C}$

Thermal Characteristic

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

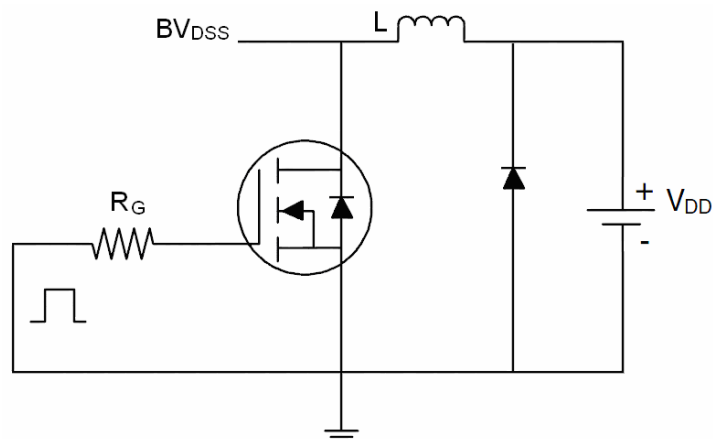
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	100	110	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.3	1.6	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =10A	-	16	20	mΩ
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 4.5V, I _D =10A	-	18	22	mΩ
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =10A	-	26	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C _{ISS}	V _{DS} =50V, V _{GS} =0V, F=1.0MHz	-	2600	-	PF
Output Capacitance	C _{OSS}		-	590	-	PF
Reverse Transfer Capacitance	C _{RSS}		-	291	-	PF
Switching Characteristics (Note 4)						
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}		-	16	-	nC
Gate-Drain Charge	Q _{gd}		-	24	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V, I _S =10A	-	0.85	1.2	V
Diode Forward Current (Note 2)	I _S		-	-	10	A
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F = 10A	-	33		nS
Reverse Recovery Charge	Q _{rr}	di/dt = 100A/μs (Note 3)	-	54		nC

Notes:

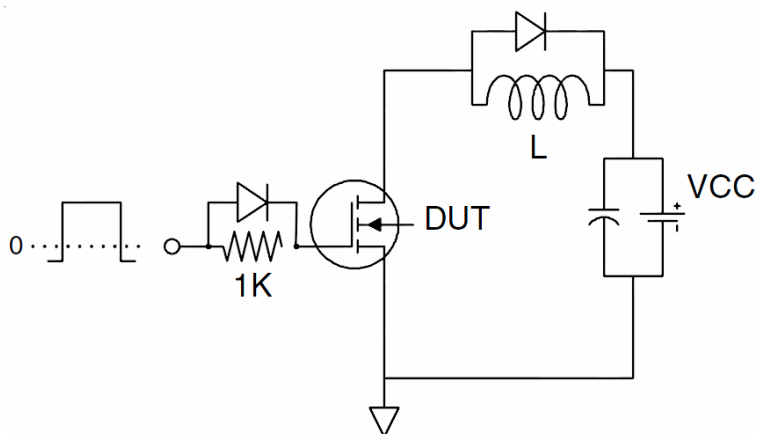
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Test Circuit

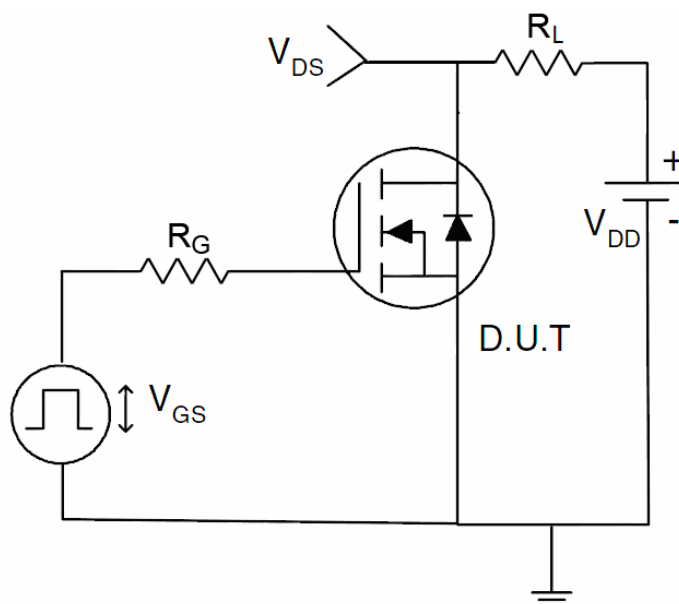
1) E_{AS} test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics (Curves)

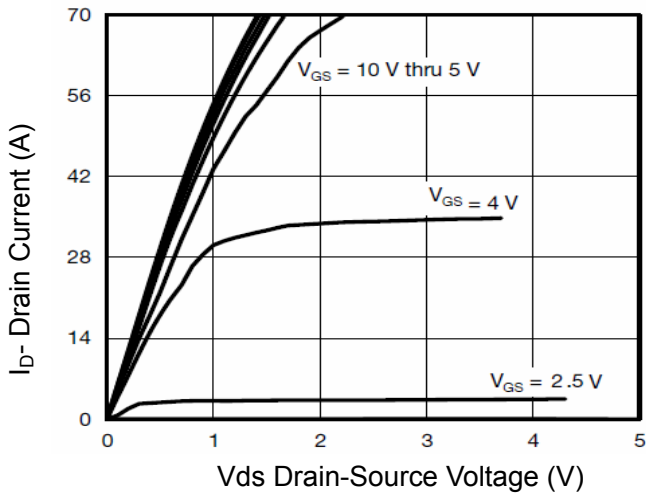


Figure 1 Output Characteristics

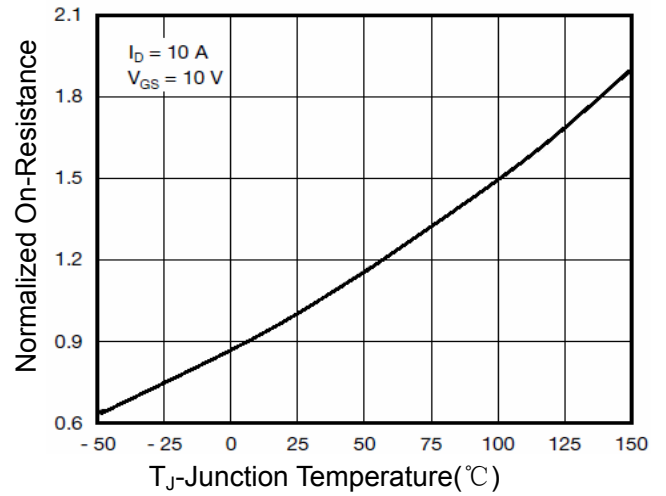


Figure 4 Rdson-Junction Temperature

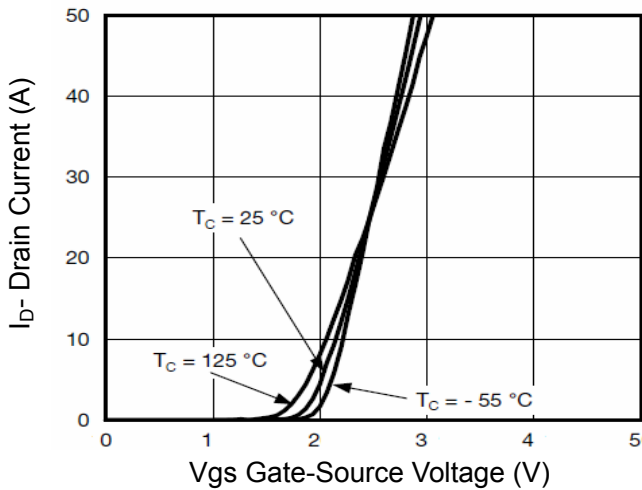


Figure 2 Transfer Characteristics

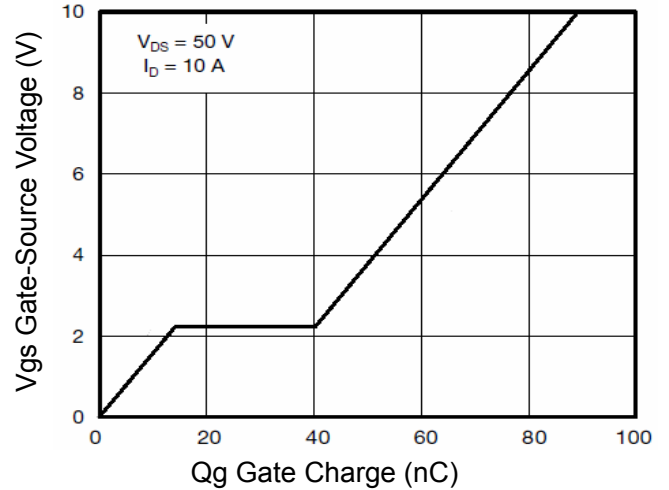


Figure 5 Gate Charge

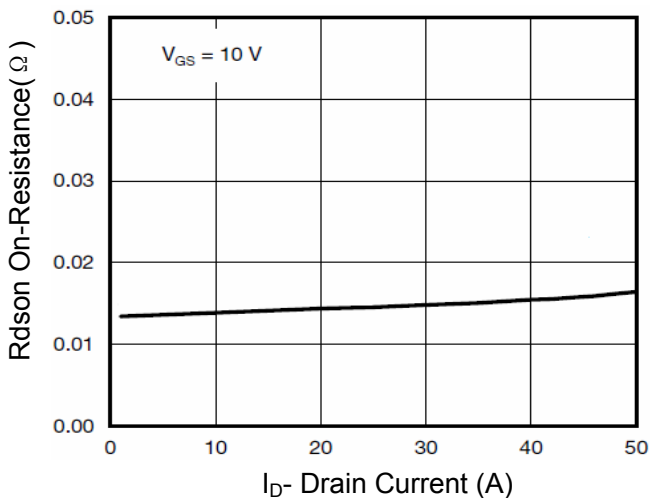


Figure 3 Rdson- Drain Current

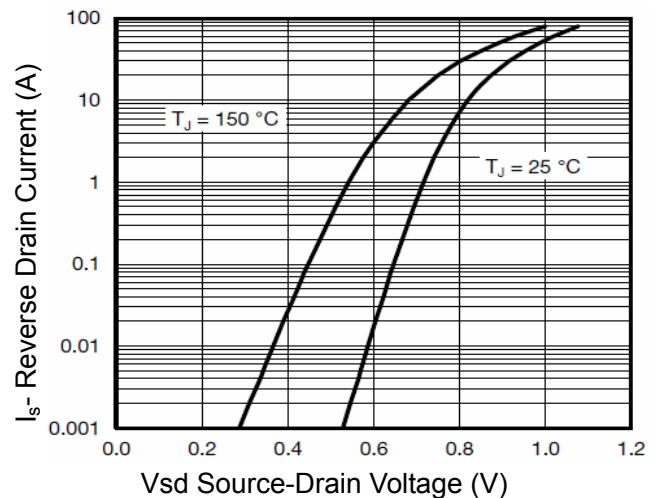


Figure 6 Source- Drain Diode Forward

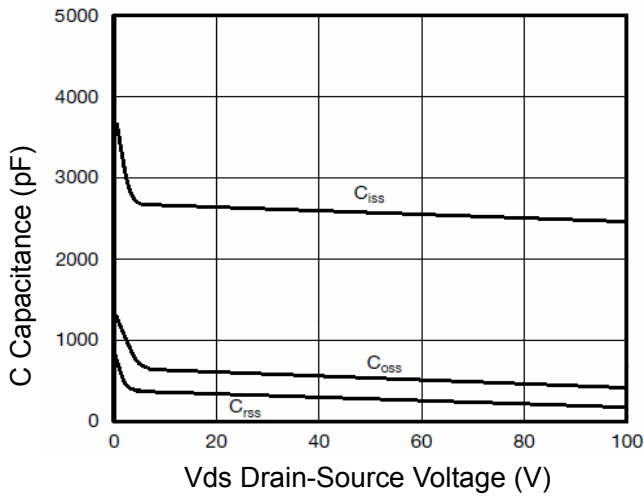


Figure 7 Capacitance vs Vds

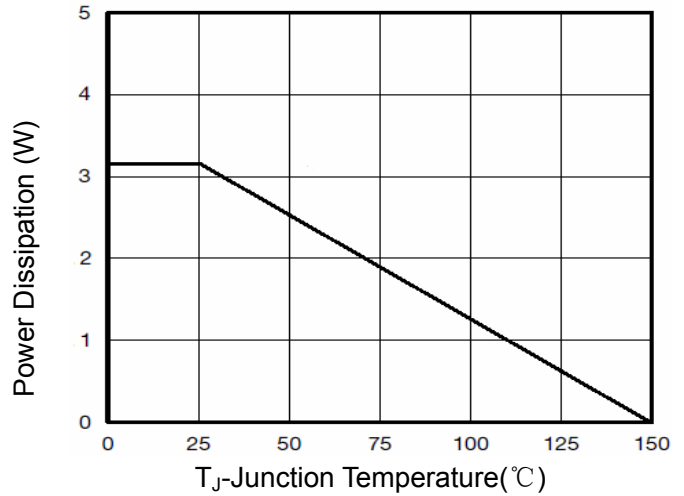


Figure 9 Power De-rating

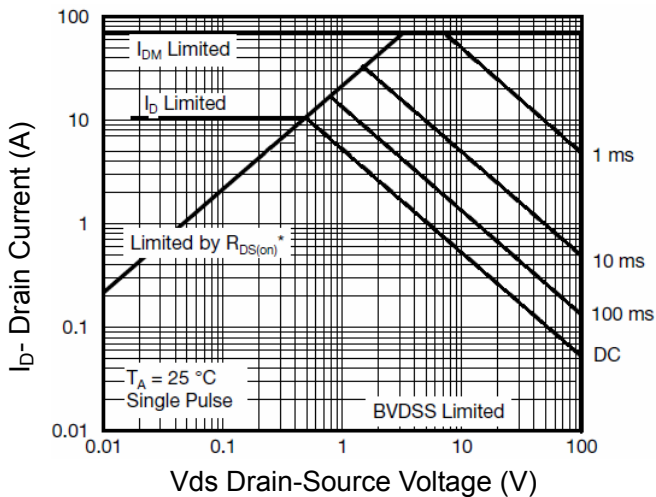


Figure 8 Safe Operation Area

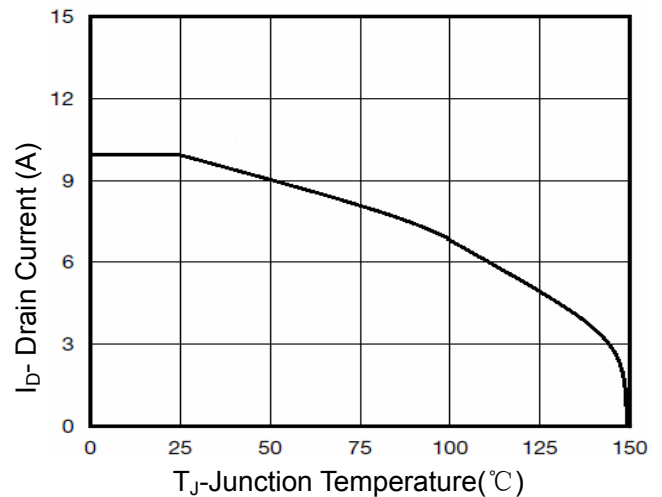


Figure 10 Current De-rating

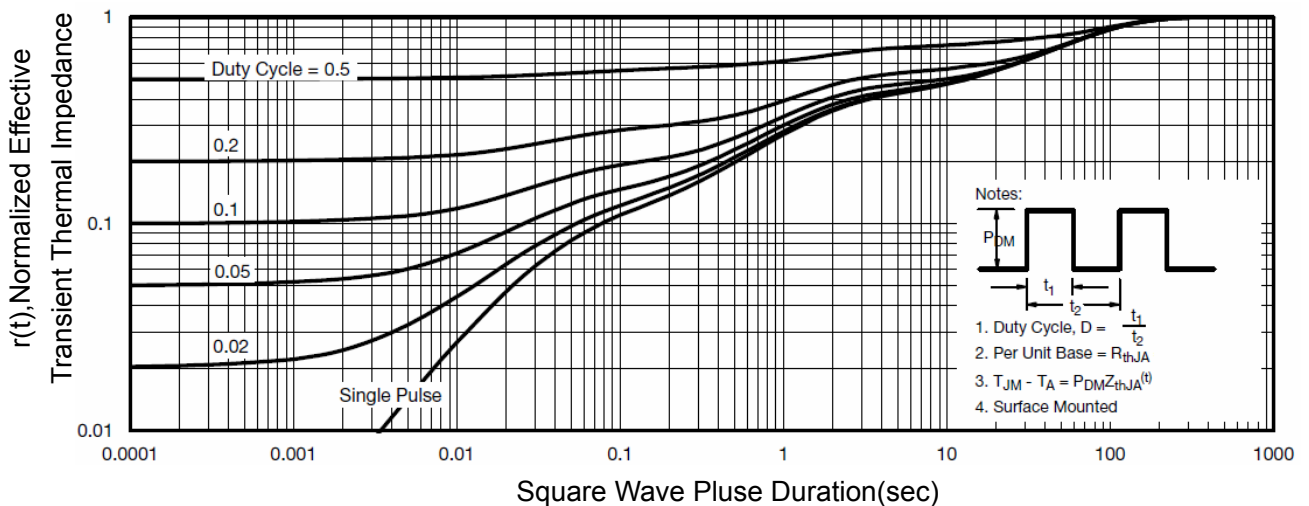


Figure 11 Normalized Maximum Transient Thermal Impedance