

Description

The G12N10 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

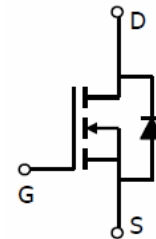
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V_{DSS}	$R_{DS(ON)}$ @4.5V(Typ)	$R_{DS(ON)}$ @10V(Typ)	I_D
100V	15.5 m Ω	14.5 m Ω	12A

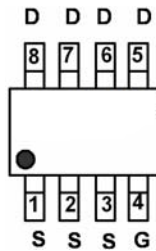
- Special process technology for high ESD capability
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current

Application

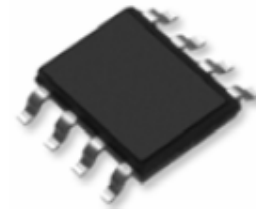
- DC/DC Primary Side Switch
- Telecom/Server
- Synchronous Rectification



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	12	A
Drain Current-Continuous($T_C=100^\circ\text{C}$)	$I_D(100^\circ\text{C})$	8.4	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 ($T_A=25^\circ\text{C}$ unless otherwise noted)

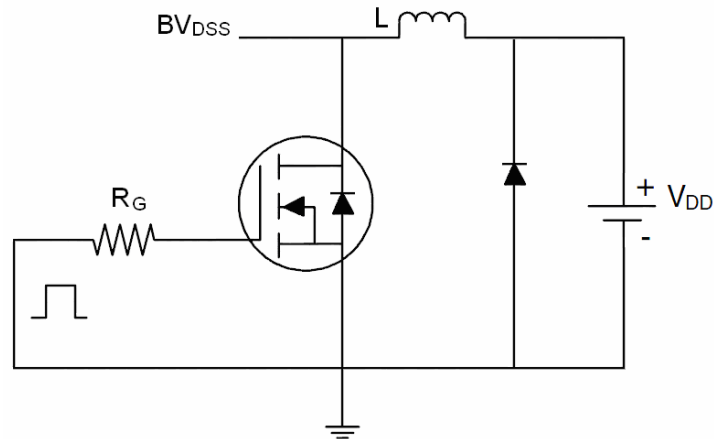
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100	110	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.7	2.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=6A$	-	14.5	17	m Ω
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=6A$	-	15.5	20	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=6A$	-	26	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C_{ISS}	$V_{DS}=50V, V_{GS}=0V,$ $F=1.0\text{MHz}$	-	3800	-	PF
Output Capacitance	C_{OSS}		-	690	-	PF
Reverse Transfer Capacitance	C_{RSS}		-	291	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=50V, I_D=6A, R_L=5\Omega,$ $R_G=1\Omega, V_{GS}=10V$	-	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	$I_D=6A, V_{DD}=50V, V_{GS}=10V$	-	95	-	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}	$V_{GS}=0V, I_S=12A$	-	0.85	1.2	V
Diode Forward Current (Note 2)	I_S		-	-	10	A
Reverse Recovery Time	t_{rr}	$T_J = 25^\circ\text{C}, I_F = 12A$	-	33		nS
Reverse Recovery Charge	Q_{rr}	$di/dt = 100A/\mu s$ (Note 3)	-	54		nC

Notes:

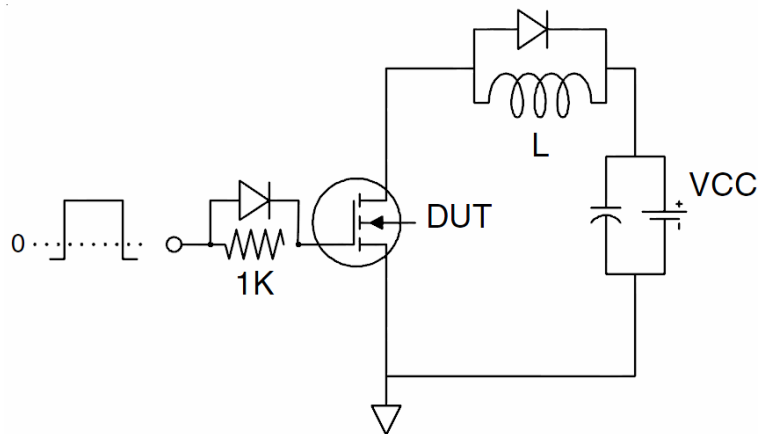
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

Test Circuit

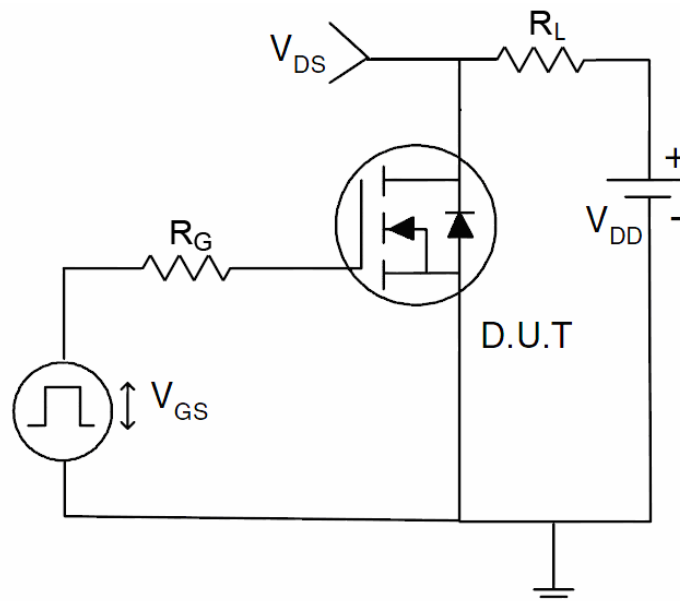
1) E_{AS} test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics (Curves)

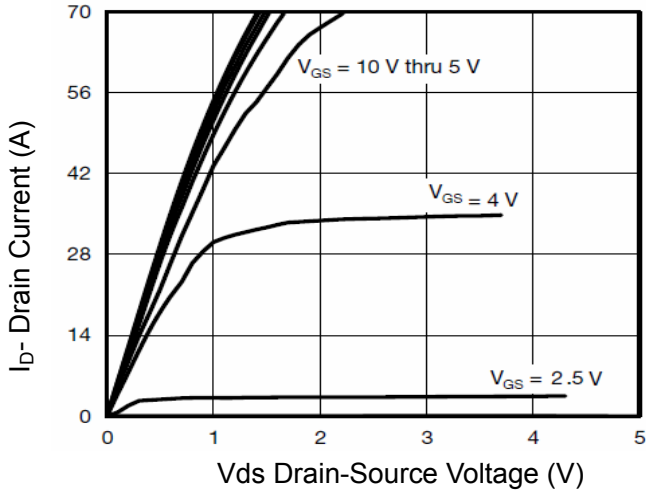


Figure 1 Output Characteristics

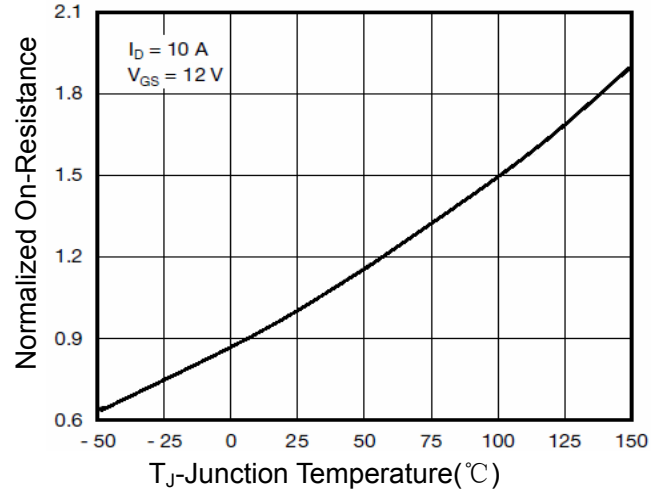


Figure 4 Rdson-Junction Temperature

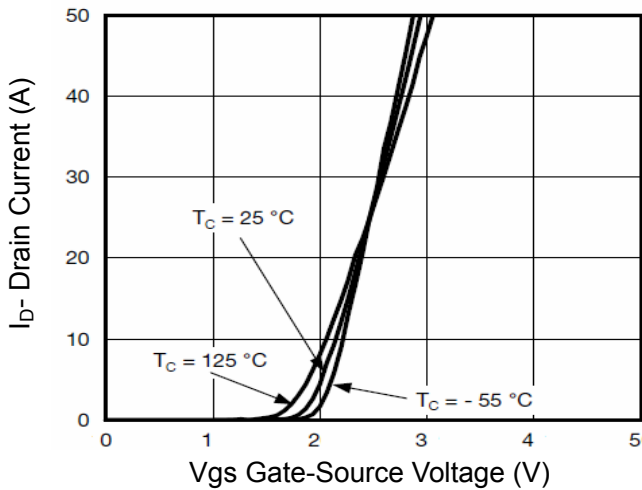


Figure 2 Transfer Characteristics

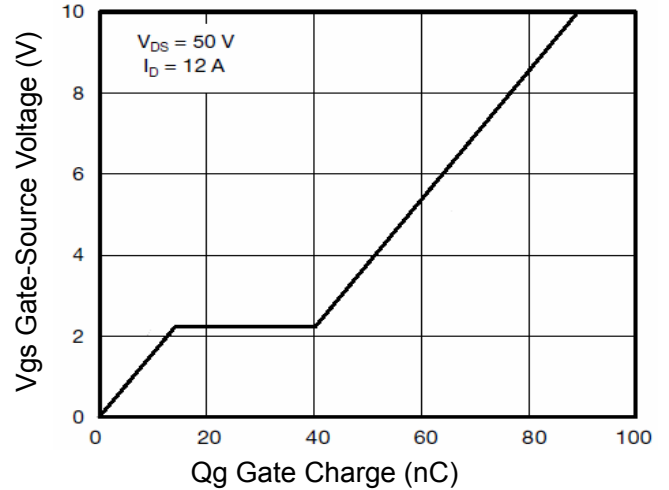


Figure 5 Gate Charge

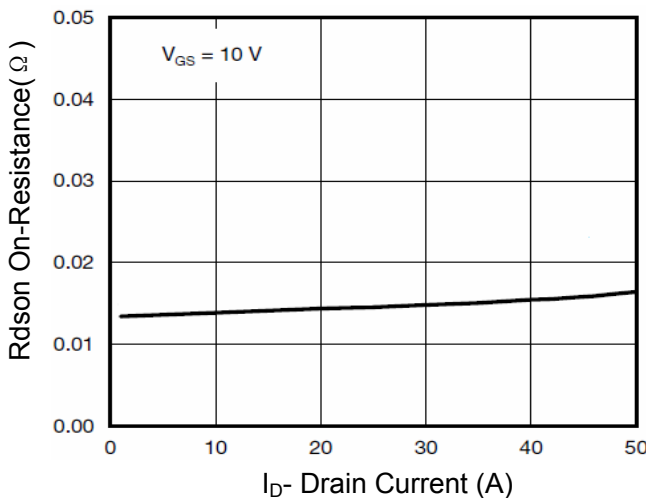


Figure 3 Rdson- Drain Current

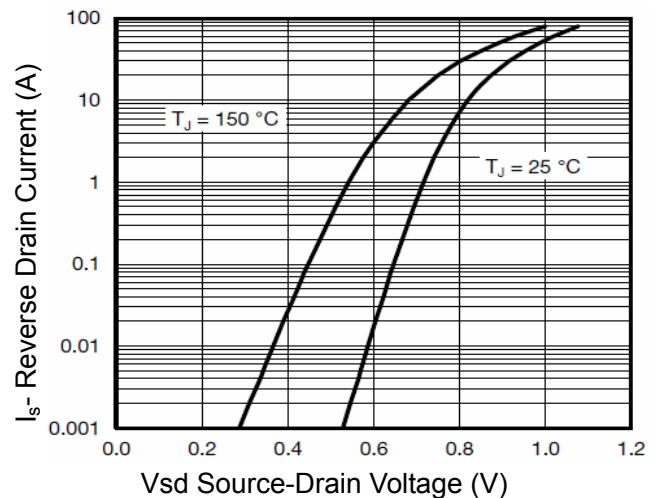


Figure 6 Source- Drain Diode Forward

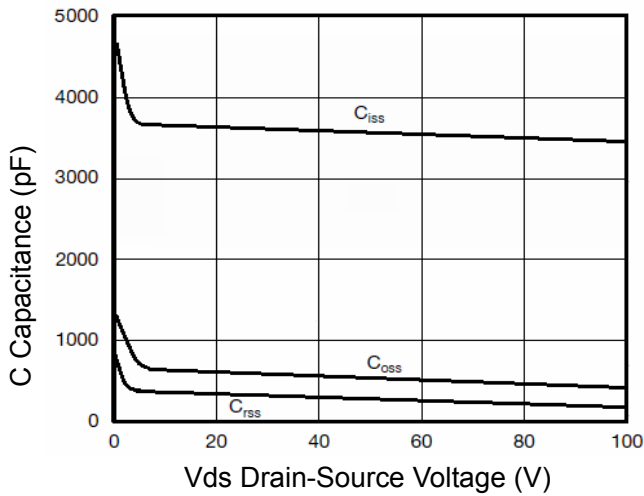


Figure 7 Capacitance vs Vds

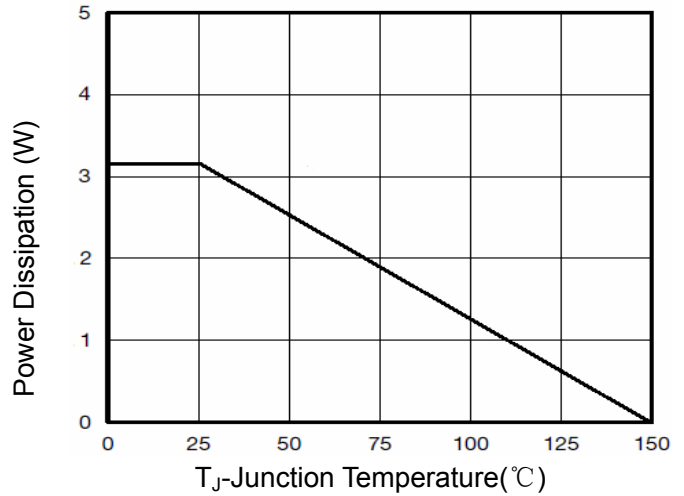


Figure 9 Power De-rating

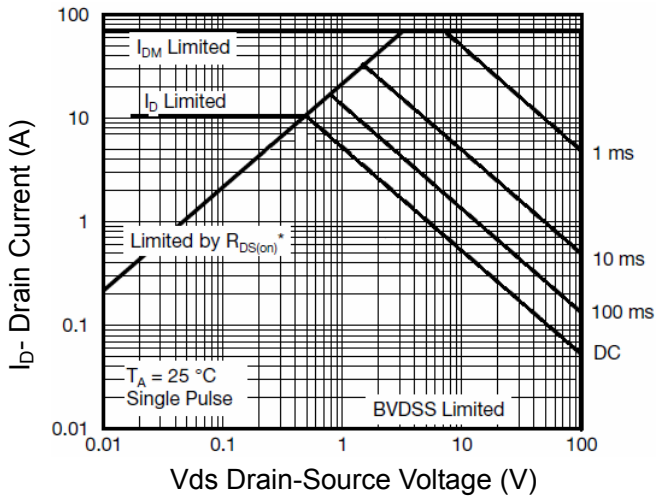


Figure 8 Safe Operation Area

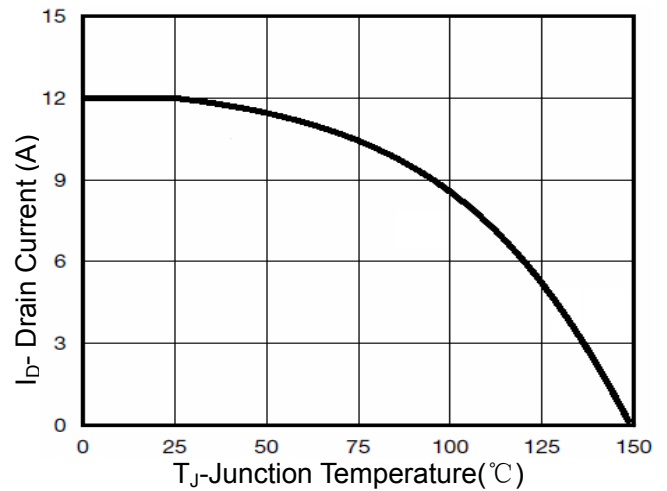


Figure 10 Current De-rating

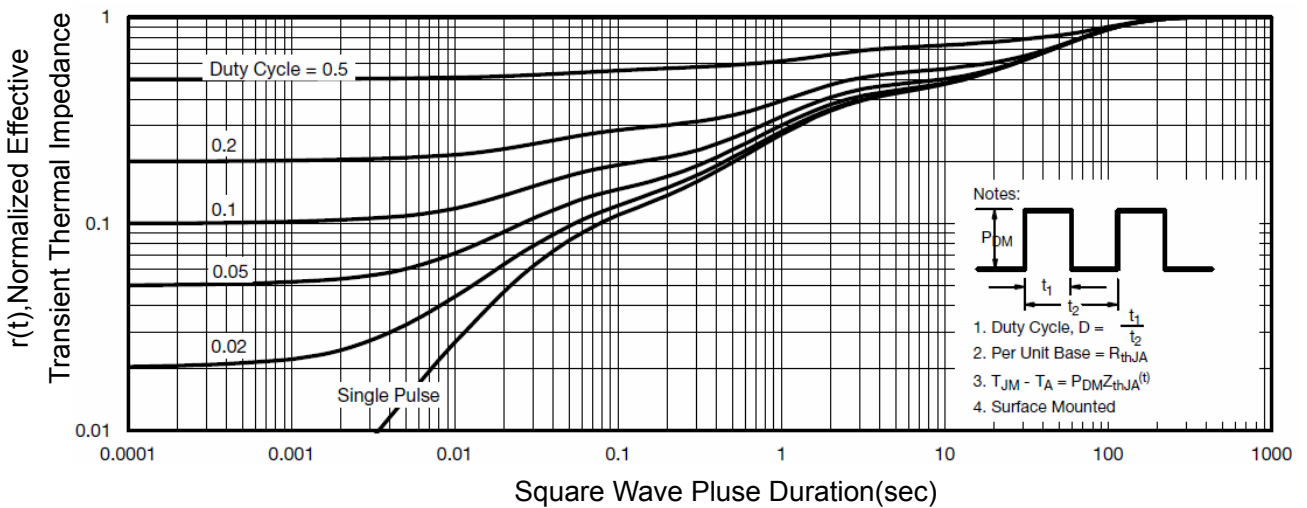


Figure 11 Normalized Maximum Transient Thermal Impedance