

Feature

- ★ Super Low Gate Charge
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ 100% EAS Guaranteed
- ★ Advanced high cell density Trench technology

RoHS

Product Summary

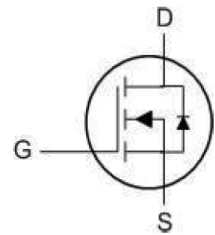
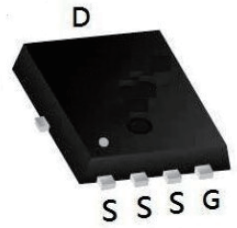
BVDSS	RDSON	ID
85V	4.3mΩ	100A

Description

The S100N85F is the high cell density trenched N ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The S100N85F meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

PDFN5*6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{DS}	Drain-to-Source Voltage	85	V
V_{GS}	Gate-to-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$	A
		$T_C = 100^\circ\text{C}$	
I_{DM}	Pulsed Drain Current ⁽¹⁾	400	A
EAS	Single Pulsed Avalanche Energy ⁽²⁾	273.8	mJ
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ⁽³⁾	60	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.16	
T_J, T_{STG}	Junction & Storage Temperature Range	-55 to 150	$^\circ\text{C}$

Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter		Test condition	Min.	Typ.	Max.	Units
Static Characteristics							
V _{(BR)DSS}	Drain-Source Breakdown Voltage		V _{GS} = 0V, I _D = 250μA	85	-	-	V
I _{GSS}	Gate-body Leakage current		V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	T _J =25°C	V _{DS} = 85V, V _{GS} = 0V	-	-	1	μA
		T _J =100°C		-	-	100	μA
V _{GS(th)}	Gate-Threshold Voltage		V _{DS} = V _{GS} , I _D = 250μA	2	3	4	V
R _{DS(on)}	Drain-Source on-Resistance ⁴		V _{GS} = 10V, I _D = 20A	-	4.3	5.6	mΩ
g _{fs}	Forward Transconductance ⁴		V _{DS} = 5V, I _D =20A	-	57.8	-	S
Dynamic Characteristics ⁵							
C _{iss}	Input Capacitance		V _{DS} = 40V, V _{GS} =0V, f =1MHz	-	4645	-	pF
C _{oss}	Output Capacitance			-	673	-	pF
C _{rss}	Reverse Transfer Capacitance			-	41	-	pF
R _g	Gate Resistance		f=1MHz	-	2	-	Ω
Switching Characteristics ⁵							
Q _g	Total Gate Charge		V _{GS} = 10V, V _{DS} = 40V, I _D = 20A	-	61.3	-	nC
Q _{gs}	Gate-Source Charge			-	21	-	nC
Q _{gd}	Gate-Drain Charge			-	11	-	nC
t _{d(on)}	Turn-on Delay Time		V _{GS} =10V, V _{DD} = 40V, R _G = 3Ω, I _D = 20A	-	16.5	-	ns
t _r	Rise Time			-	51.8	-	ns
t _{d(off)}	Turn-off Delay Time			-	37.1	-	ns
t _f	Fall Time			-	8.2	-	ns
t _{rr}	Body Diode Reverse Recovery Time			-	69	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		I _f =20A, di/dt = 100A/μS	-	141	-	nC
Drain-Source Body Diode Characteristics							
V _{SD}	Diode Forward Voltage ⁴		I _S = 20A, V _{GS} = 0V	-	-	1.2	V
I _S	Continuous Source Current	T _C =25°C	-	-	-	100	A

Notes:

- 1.Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ\text{C}$
- 2.The EAS data shows Max. rating . The test condition is $V_{DD} = 50V, V_{GS} = 10V, L = 0.4mH, I_{AS} = 37A$
- 3.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper, The value in any given application depends on the user's specific board design.
- 4.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 5.This value is guaranteed by design hence it is not included in the production test.

Typical Electrical and Thermal Characteristics (Curves)

Figure1: Output Characteristics

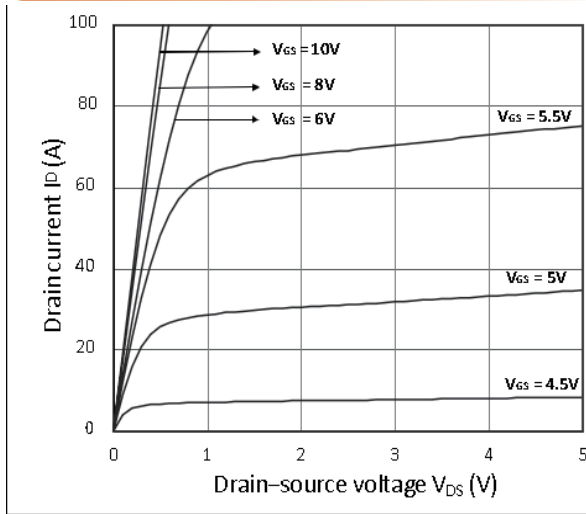


Figure 2: Typical Transfer Characteristics

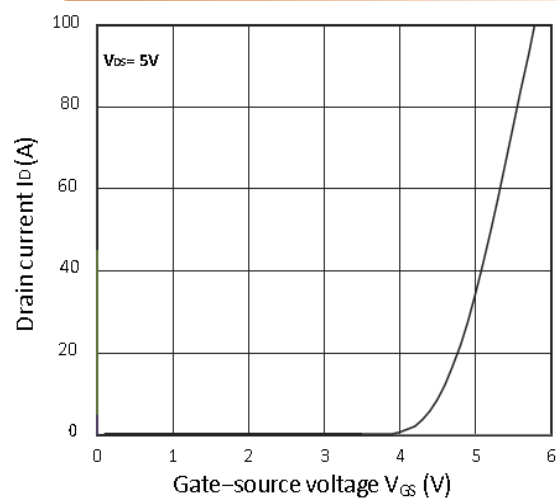


Figure 3: Forward Characteristics of Reverse

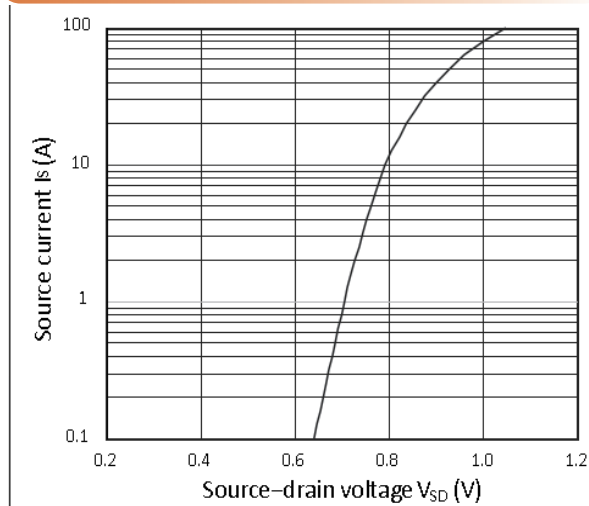


Figure 4: RDS(ON) vs. VGS

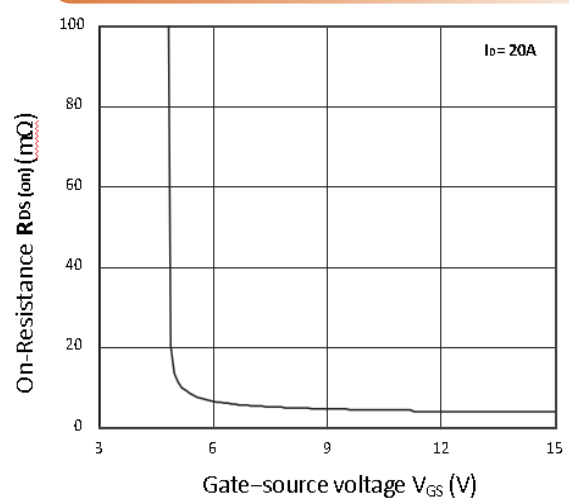


Figure 5: RDS(ON) vs. ID

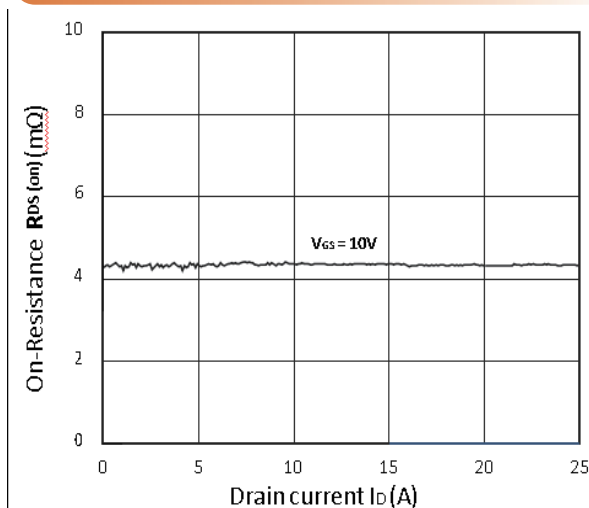
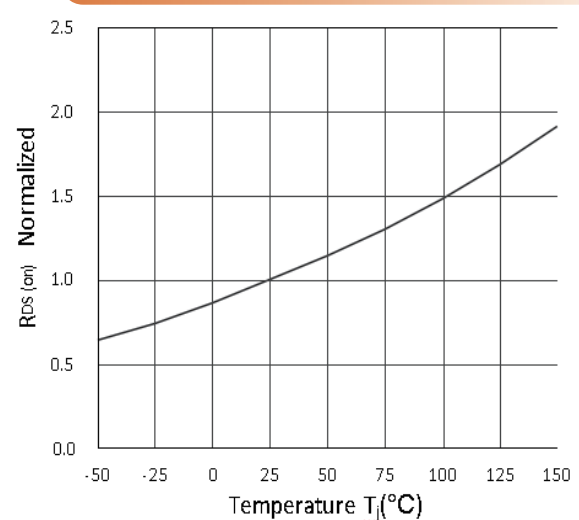


Figure 6: Normalized RDS(on) vs. Temperature



Typical Performance Characteristics

Figure 7: Capacitance Characteristics

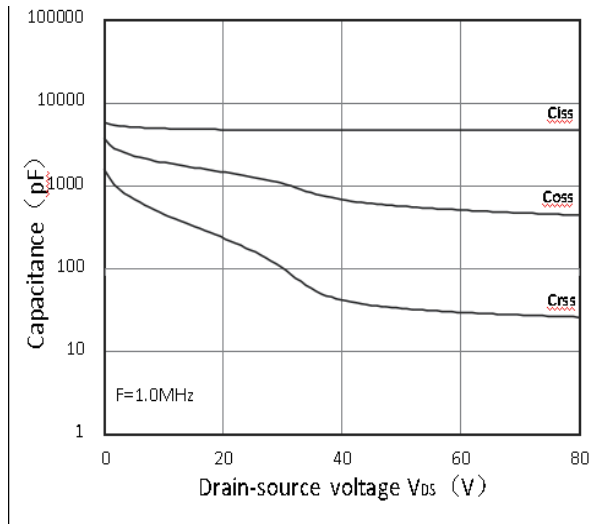


Figure 8: Gate Charge Characteristics

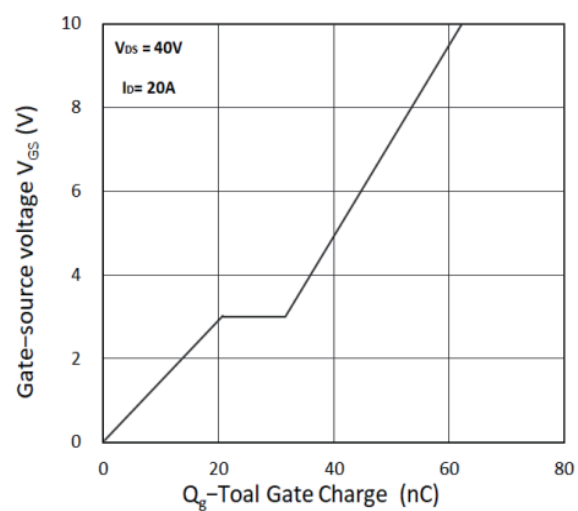


Figure 9: Power Dissipation

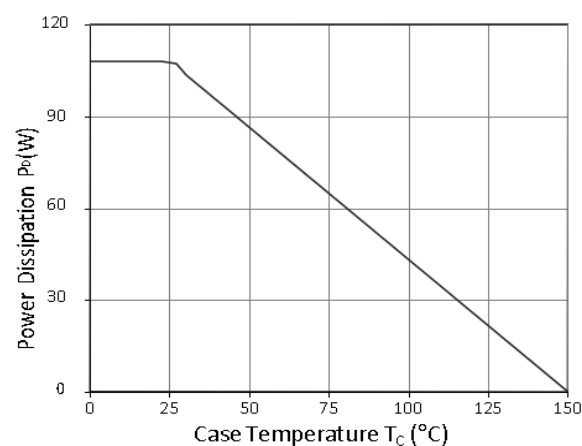


Figure 10: Safe Operating Area

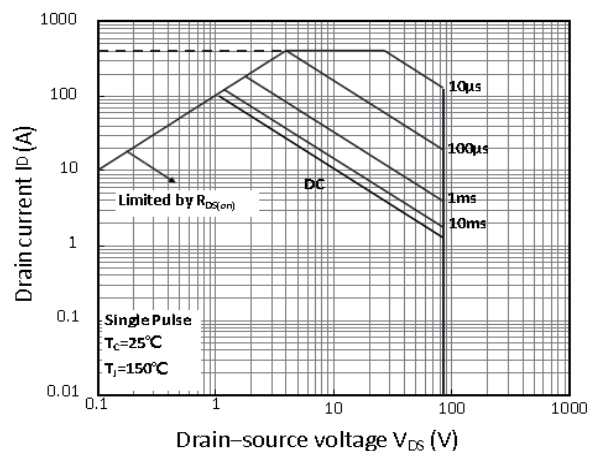
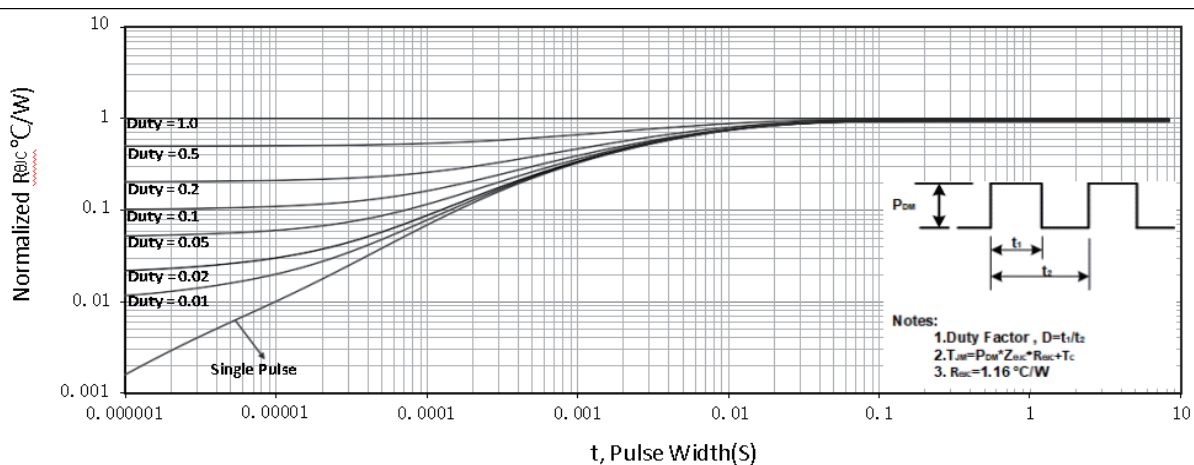
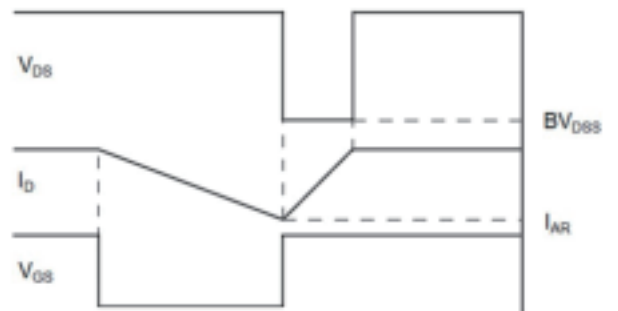
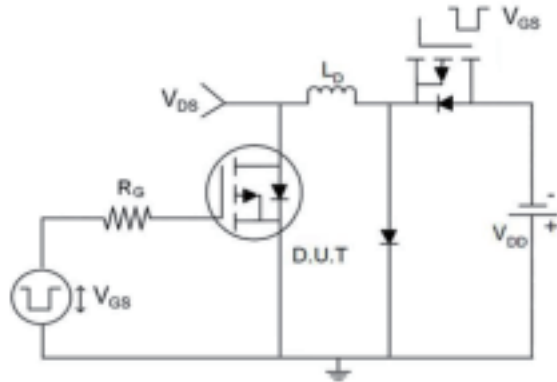


Figure 11 Normalized Maximum Transient Thermal Impedance

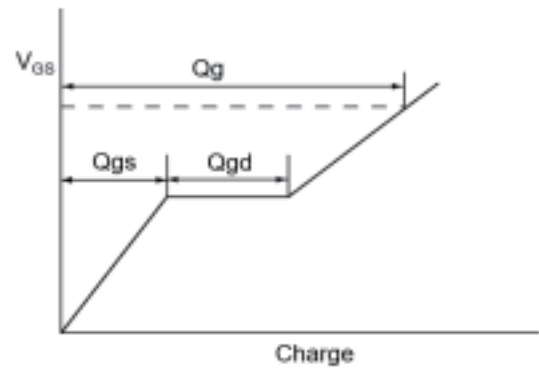
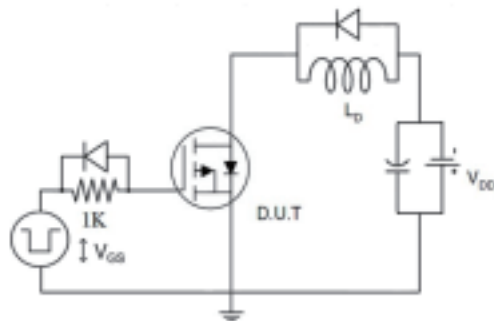


Test Circuit

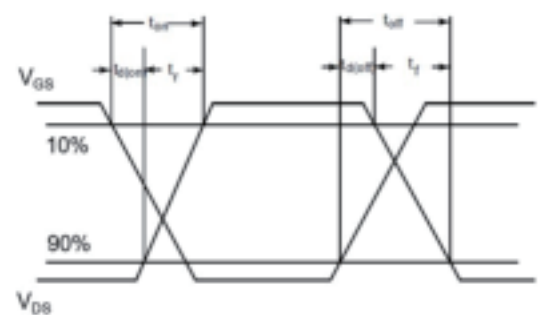
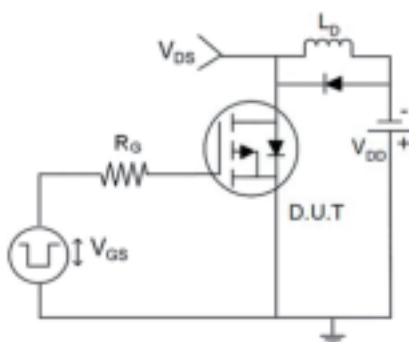
1) E_{AS} Test Circuits



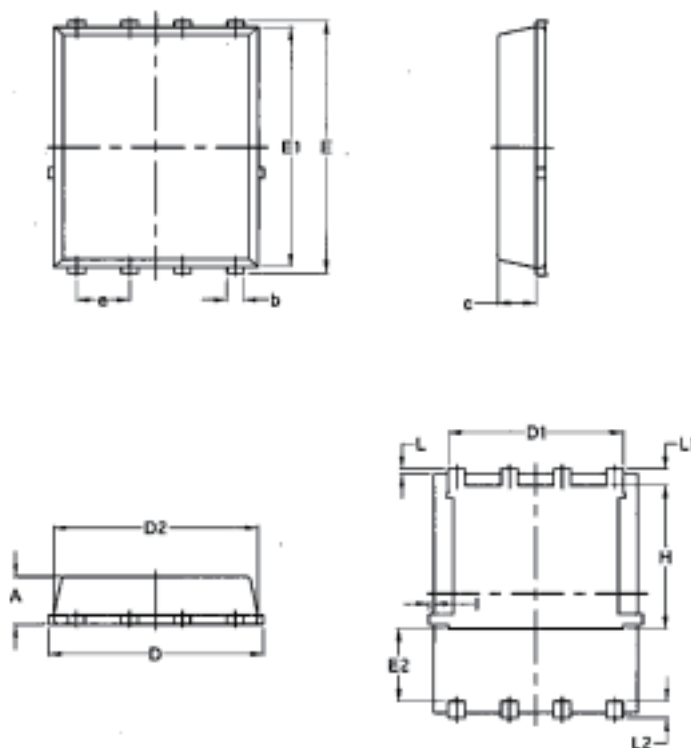
2) Gate Charge Test Circuit



3) Switch Time Test Circuit



Package Mechanical Data-DFN5*6-8L-JQ Single



Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070