XRS130N85G

N-Ch 100V Fast Switching MOSFETs

Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low RDS(ON)

Product Summary

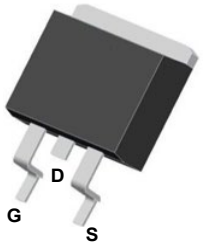
Green

BVDSS	RDSON	ID
85V	4.2 mΩ	130A

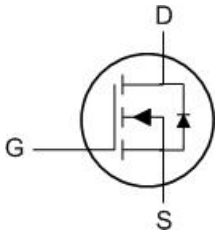
Applications

- DC-DC Converters
- Power managemen t functions
- Synchronous-rectification applications

TO263Pin Configuration



TO-263



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	85	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	130	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	79	A
I_{DM}	Pulsed Drain Current [1]	500	A
EAS	Single Pulse Avalanche Energy [2]	273.8	A
P_D@T_C=25℃	Total Power Dissipation	162	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [3]	---	58	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	0.77	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	85	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	---	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance a3	V_{GS}=10V , I_D=21A	---	4.2	5.5	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2	3	4	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	---	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=85V , V_{GS}=0V , Tj=25°C	---	---	1	uA
		V_{DS}=85V , V_{GS}=0V ,Tj=100°C	---	---	100	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=20A	---	55	---	S
R_g	Gate Resistance	f=1MHz	---	1.8	---	Ω
Q_g	Total Gate Charge	V_{DS}=40V , V_{GS}=10V , I_D=20A	---	61.3	---	nC
Q_{gs}	Gate-Source Charge		---	21	---	
Q_{gd}	Gate-Drain Charge		---	11	---	
$T_{d(on)}$	Turn-On Delay Time	V_{GS}=10V, V_{DD}=40V, I_D=20A, R_G=3Ω,	---	16.5	---	ns
T_r	Rise Time		---	51.8	---	
$T_{d(off)}$	Turn-Off Delay Time		---	21	---	
T_f	Fall Time		---	11	---	
C_{iss}	Input Capacitance	V_{DS}=40V , V_{GS}=0V , f=1MHz	---	4645	---	pF
C_{oss}	Output Capacitance		---	673	---	
C_{rss}	Reverse Transfer Capacitance		---	41	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Is	Maximum Continuous Drain to Source Diode Forward Current Tc=25°C		---	---	130	A
V_{SD}	Diode Forward Voltage 4	I_S=20A, V_{GS}=0V			1.2	
trr	Recerse Recovery Time	I_f=20A,di/dt=100A/us	---	69	---	nS
Qrr	Recerse Recovery Charge	I_f=20A,di/dt=100A/us	---	141	---	nC

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
2. The EAS data shows Max. rating . The test condition is V_{DD}=50V, V_{GS}=10V, L=0.4mH, I_{AS}=54A.
3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

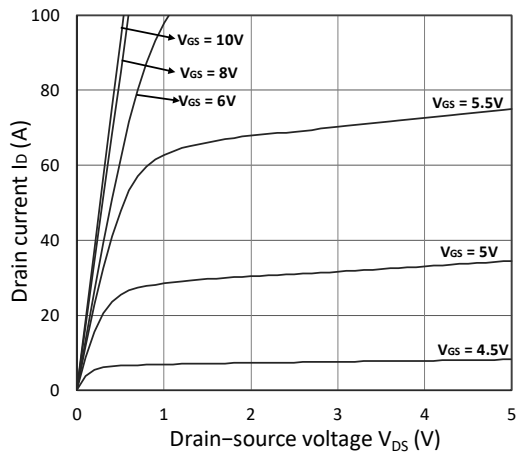


Figure 1. Output Characteristics

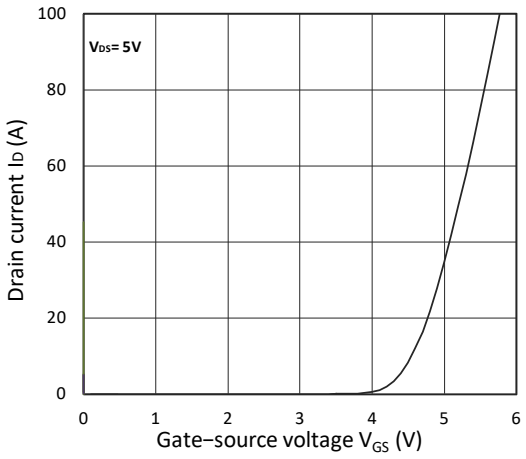


Figure 2. Transfer Characteristics

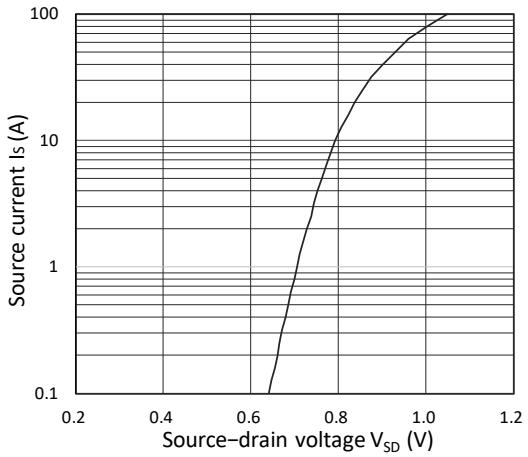


Figure 3. Forward Characteristics of Reverse

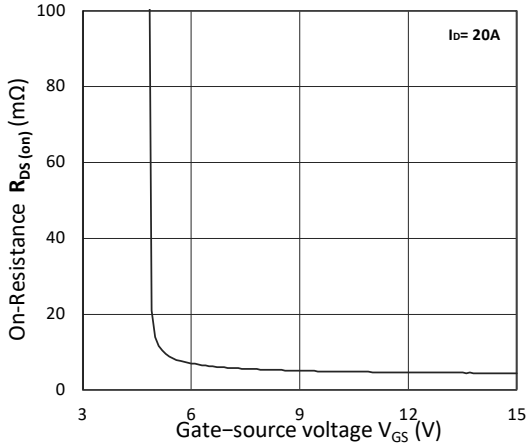


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

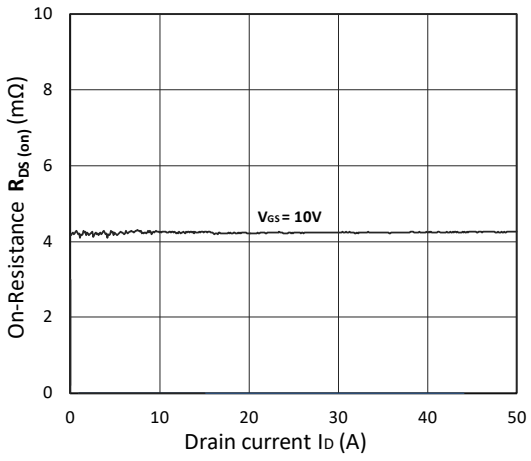


Figure 5. $R_{DS(ON)}$ vs. I_D

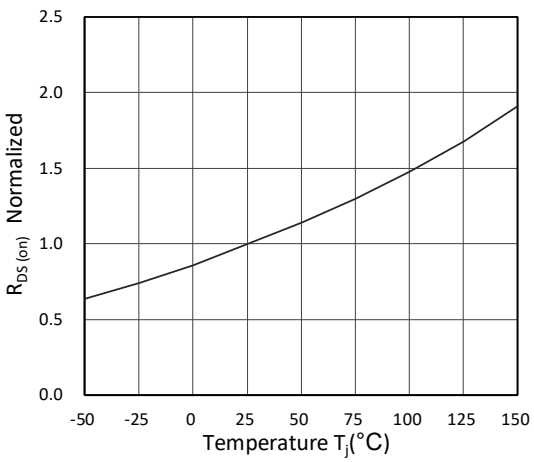


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

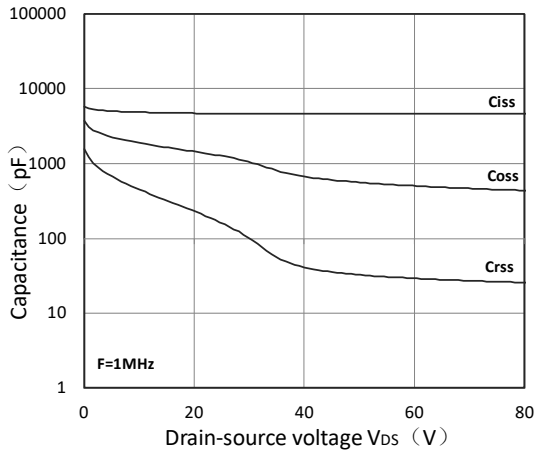


Figure 7. Capacitance Characteristics

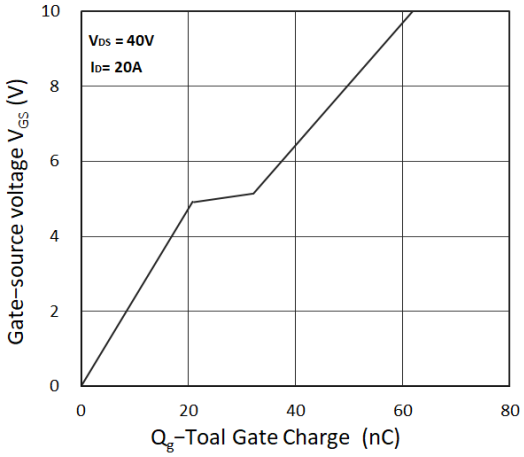


Figure 8. Gate Charge Characteristics

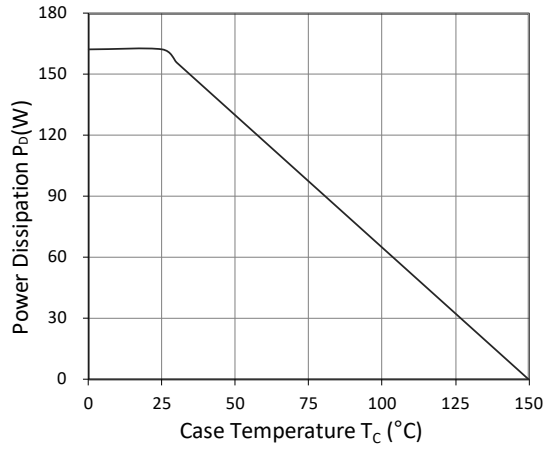


Figure 9. Power Dissipation

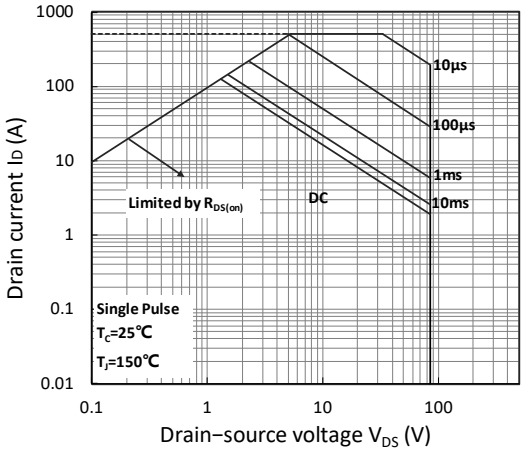


Figure10. Safe Operating Area

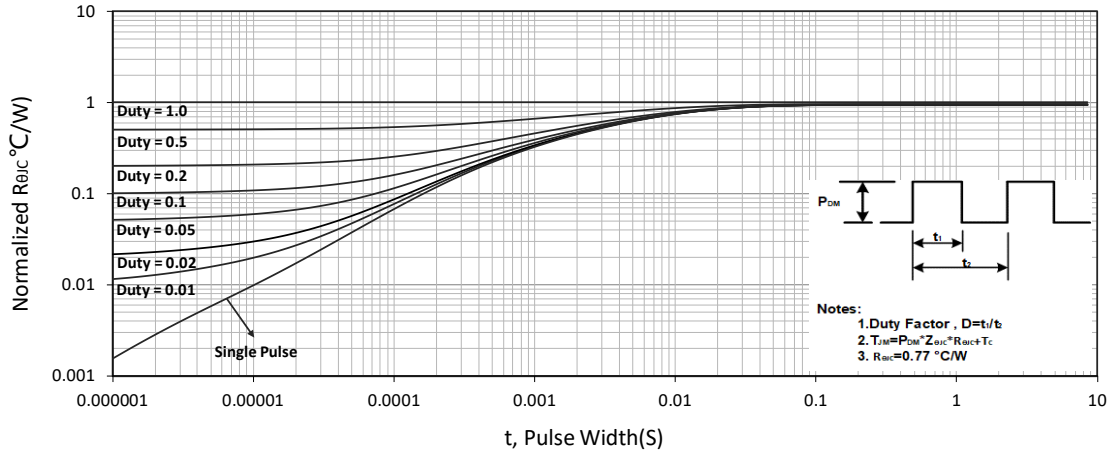


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

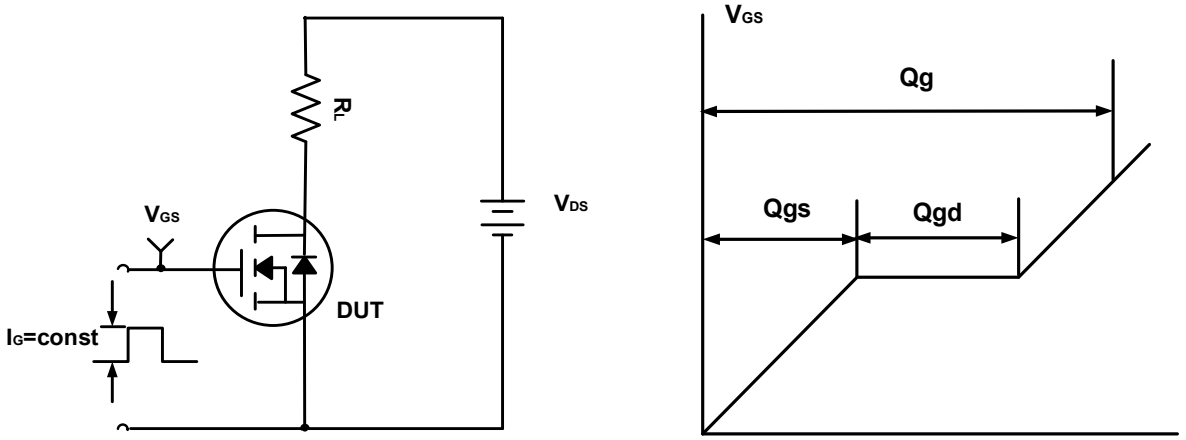


Figure A. Gate Charge Test Circuit & Waveforms

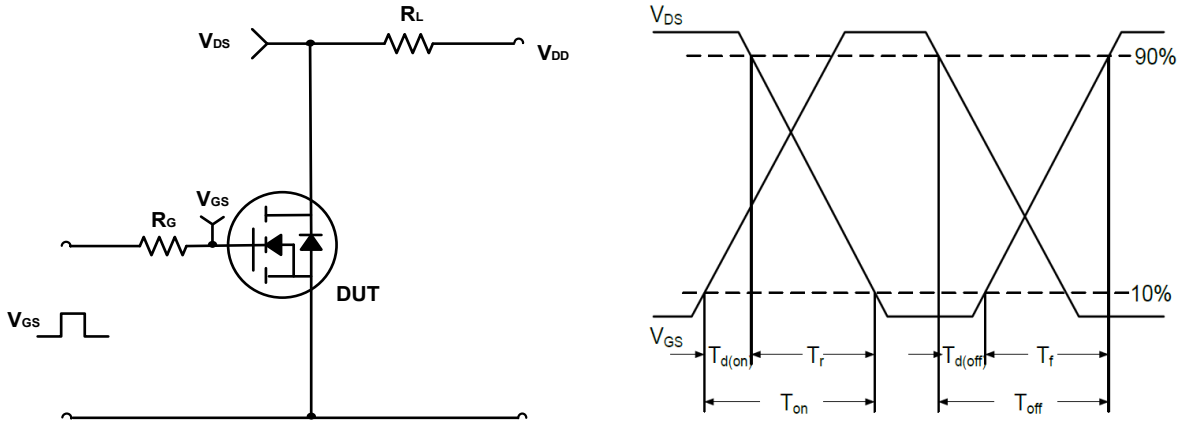


Figure B. Switching Test Circuit & Waveforms

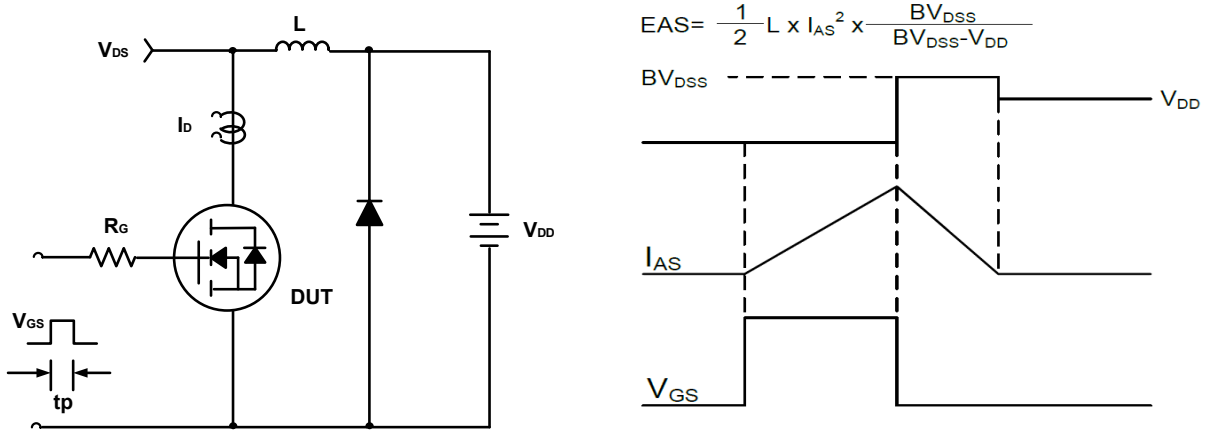
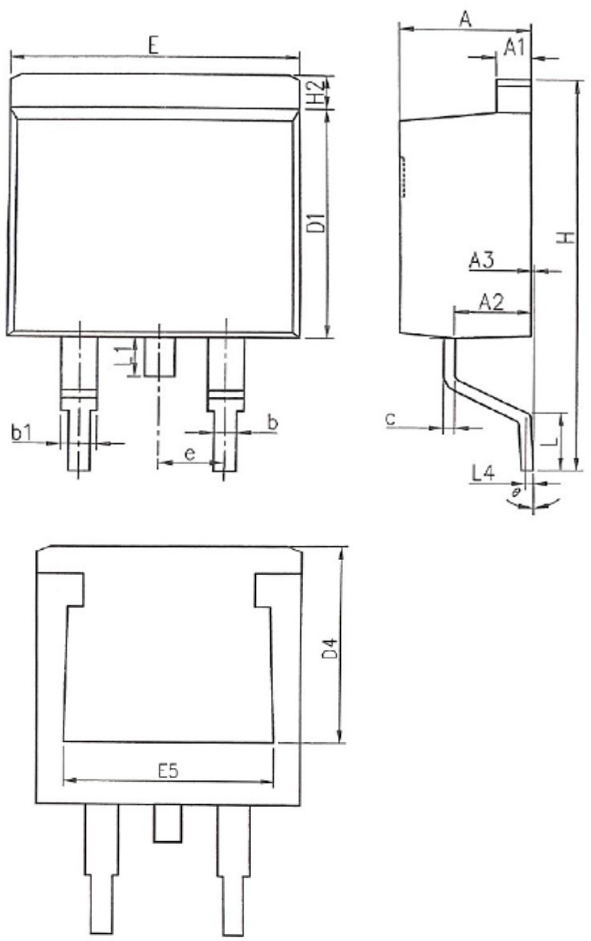


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Mechanical Dimensions for TO-263



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	4.37	4.89
A1	1.17	1.42
A2	2.20	2.90
A3	0.00	0.25
b	0.70	0.96
b1	1.17	1.47
c	0.28	0.60
D1	8.45	9.30
D4	6.60	-
E	9.80	10.40
E5	7.06	-
e	2.54BSC	
H	14.70	15.70
H2	1.07	1.47
L	2.00	2.80
L1	-	1.75
L4	0.254BSC	
θ	0°	9°