

General Description

The WSD60N10GDN56 is the highest performance trench N-Ch MOSFET with extreme high cell density, which provide excellent R_{DS(on)} and gate charge for most of the synchronous buck converter applications.

The WSD60N10GDN56 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Features

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

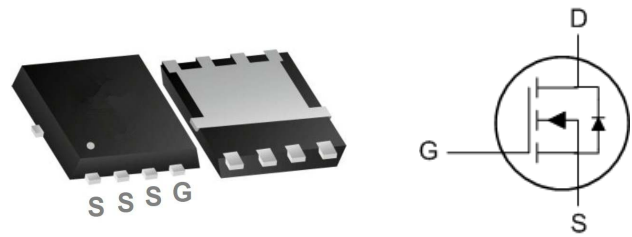
Product Summary

BV _{DSS}	R _{DS(on)}	I _D
100V	8.5mΩ	60A

Applications

- Power Management in TV Converter.
- DC-DC Converter
- LED TV Back Light

DFN5X6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	100	V
V _{GS}	Gate-Source Voltage	±20	V
I _{D@T_C=25°C}	Continuous Drain Current	60	A
I _{DP}	Pulsed Drain Current	210	A
EAS	Avalanche Energy, Single pulse	100	mJ
P _{D@T_C=25°C}	Total Power Dissipation	125	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-Ambient ¹	---	60	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	---	1.0	°C/W

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	100	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =10A.	---	8.5	10.0	mΩ
		V _{GS} =4.5V, I _D =10A.	---	9.5	12.0	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	1.0	---	2.5	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =80V, V _{GS} =0V, T _J =25°C	---	---	1	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
Q _g	Total Gate Charge (10V)	V _{DS} =50V, V _{GS} =10V, I _D =25A	---	49.9	---	nC
Q _{gs}	Gate-Source Charge		---	6.5	---	
Q _{gd}	Gate-Drain Charge		---	12.4	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =50V, V _{GS} =10V, R _G =2.2Ω, I _D =25A	---	20.6	---	ns
T _r	Rise Time		---	5	---	
T _{d(off)}	Turn-Off Delay Time		---	51.8	---	
T _f	Fall Time		---	9	---	
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	---	2604	---	pF
C _{oss}	Output Capacitance		---	362	---	
C _{rss}	Reverse Transfer Capacitance		---	6.5	---	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	60	A
I _{SP}	Pulsed Source Current		---	---	210	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =12A, T _J =25°C	---	---	1.3	V
t _{rr}	Reverse Recovery Time	I _F =12A, dI/dt=100A/μs, T _J =25°C	---	60.4	---	nS
Q _{rr}	Reverse Recovery Charge		---	106.1	---	nC

Note

- 1) Calculated continuous current based on maximum allowable junction temperature.
- 2) Repetitive rating; pulse width limited by max. junction temperature.
- 3) Pd is based on max. junction temperature, using junction-case thermal resistance.
- 4) The value of R_{θJA} is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.
- 5) V_{DD}=50 V, R_G=25 Ω, L=0.3 mH, starting T_J=25 °C.

Typical Operating Characteristics

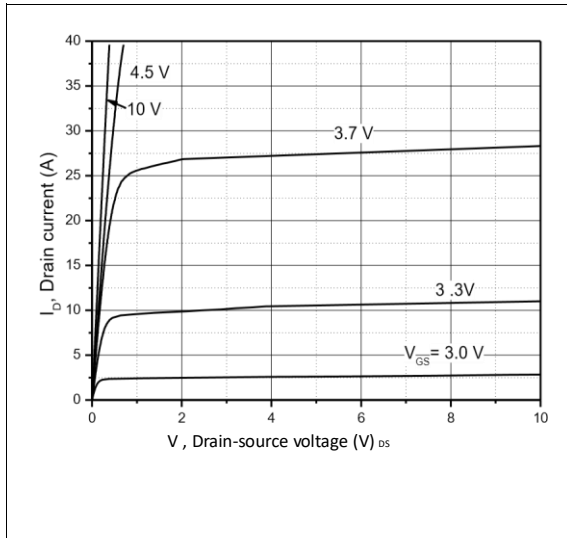


Figure 1, Typ. output characteristics

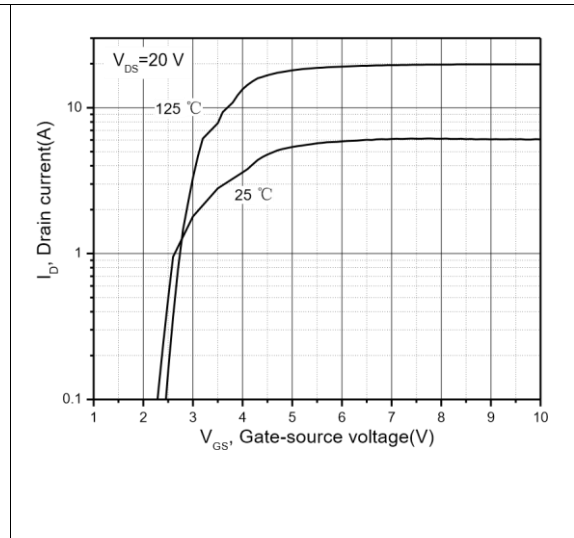


Figure 2, Typ. transfer characteristics

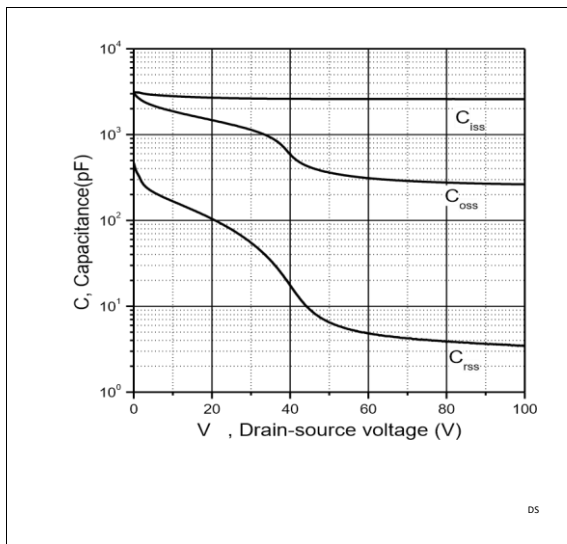


Figure 3, Typ. capacitances

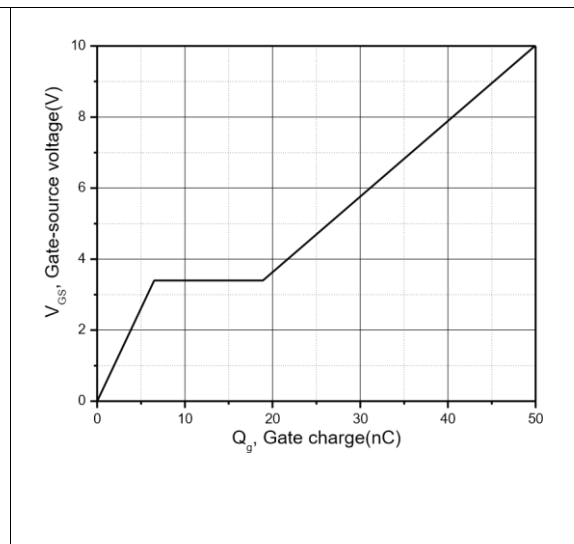


Figure 4, Typ. gate charge

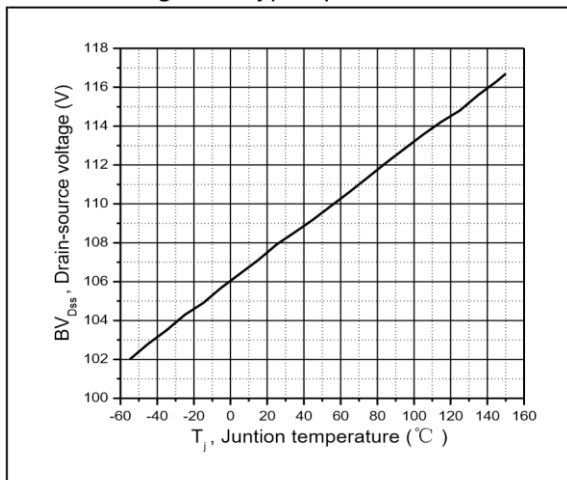


Figure 5, Drain-source breakdown voltage

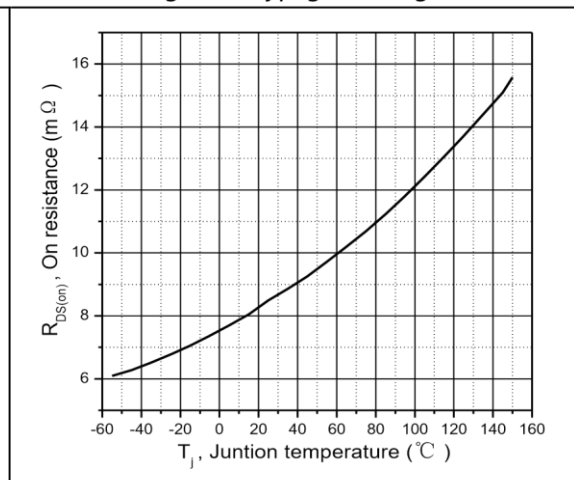


Figure 6, Drain-source on-state resistance

Typical Operating Characteristics (Cont.)

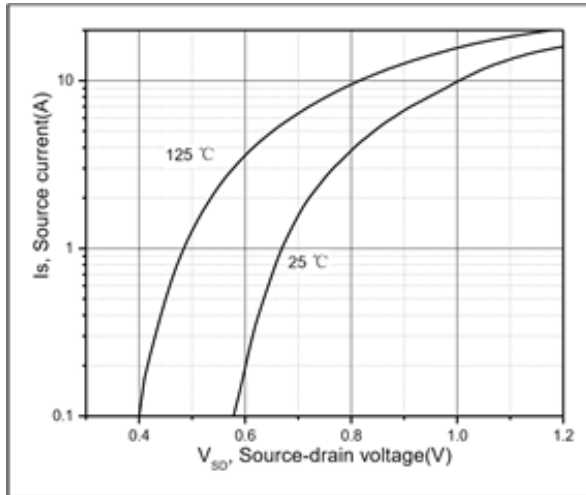


Figure 7, Forward characteristic of body diode

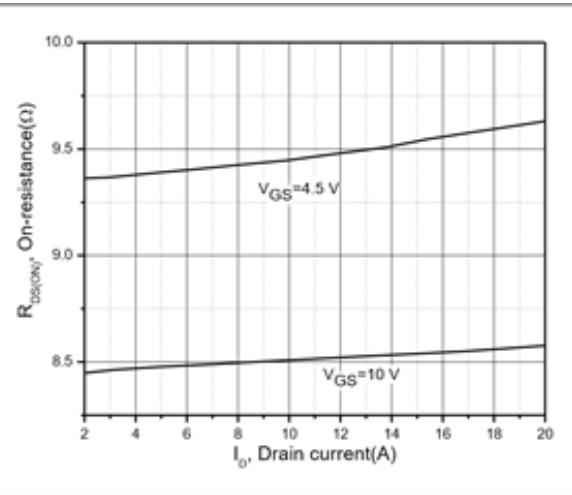
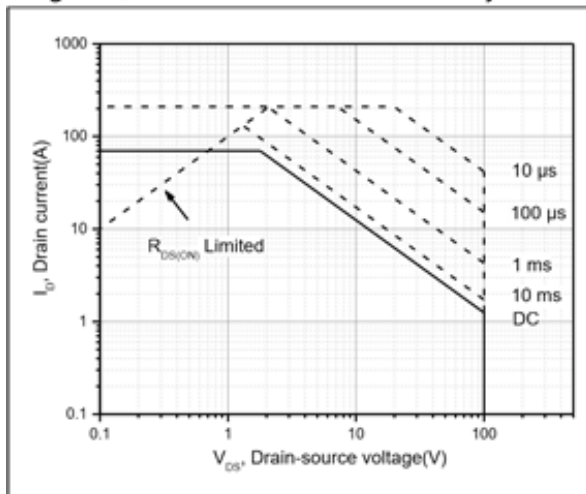


Figure 8, Drain-source on-state resistance





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