

General Description

The WSD60N10GDN56 is the highest performance trench N-Ch MOSFET with extreme high cell density, which provide excellent RDSON 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

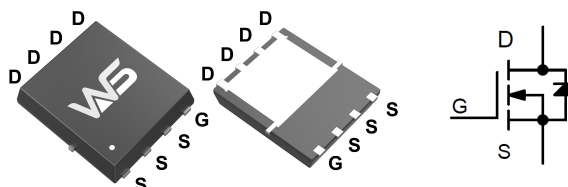
Product Summary

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
$I_D@T_C=25^\circ C$	Continuous Drain Current	60	A
I_{DP}	Pulsed Drain Current	210	A
EAS	Avalanche Energy, Single pulse	100	mJ
$P_D@T_C=25^\circ C$	Total Power Dissipation	125	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	60	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	1.0	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=10A$	---	8.5	10.0	$m\Omega$
		$V_{GS}=4.5V, I_D=10A$	---	9.5	12.0	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	---	2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 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	$V_{DD}=50V, V_{GS}=10V, R_G=2.2\Omega, I_D=25A$	---	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	$V_{DS}=50V, V_{GS}=0V, f=1\text{MHz}$	---	2604	---	pF
C_{oss}	Output Capacitance		---	362	---	
C_{rss}	Reverse Transfer Capacitance		---	6.5	---	
I_S	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	60	A
I_{SP}	Pulsed Source Current		---	---	210	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=12A, T_J=25^\circ\text{C}$	---	---	1.3	V
t_{rr}	Reverse Recovery Time	$I_F=12A, dI/dt=100A/\mu s, T_J=25^\circ\text{C}$	---	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) P_d is based on max. junction temperature, using junction-case thermal resistance.
- 4) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a=25^\circ\text{C}$.
- 5) $V_{DD}=50V, R_G=25\Omega, L=0.3mH$, starting $T_J=25^\circ\text{C}$.

Typical Operating Characteristics

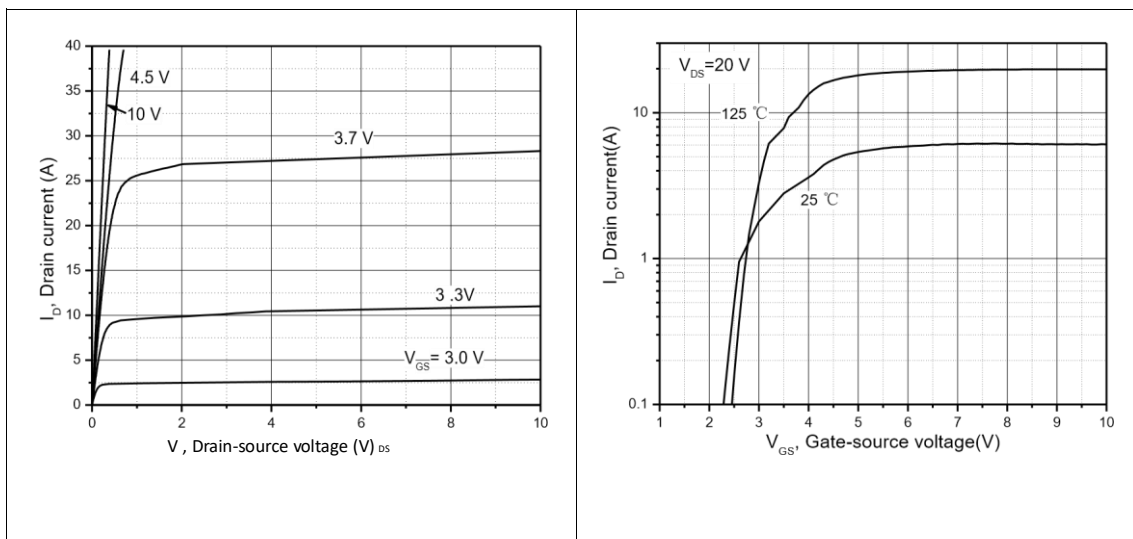


Figure 1, Typ. output characteristics

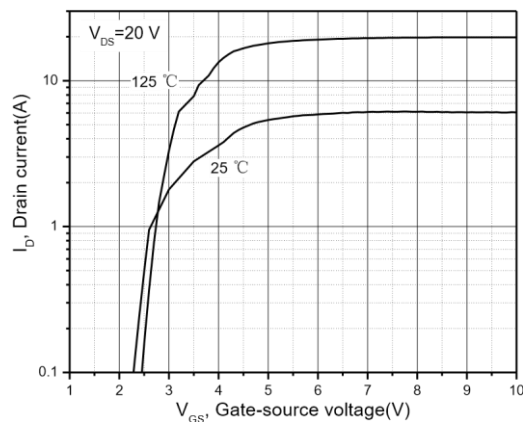


Figure 2, Typ. transfer characteristics

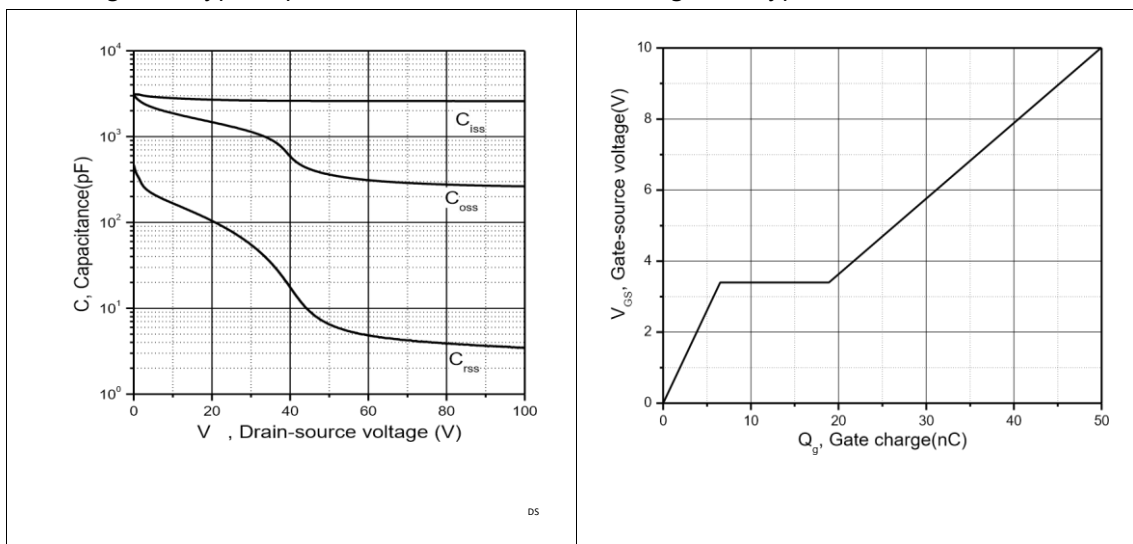


Figure 3, Typ. capacitances

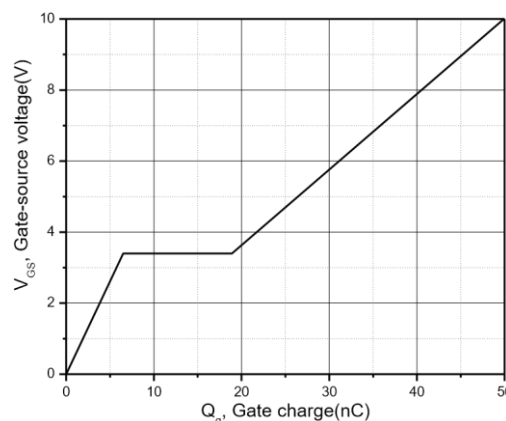


Figure 4, Typ. gate charge

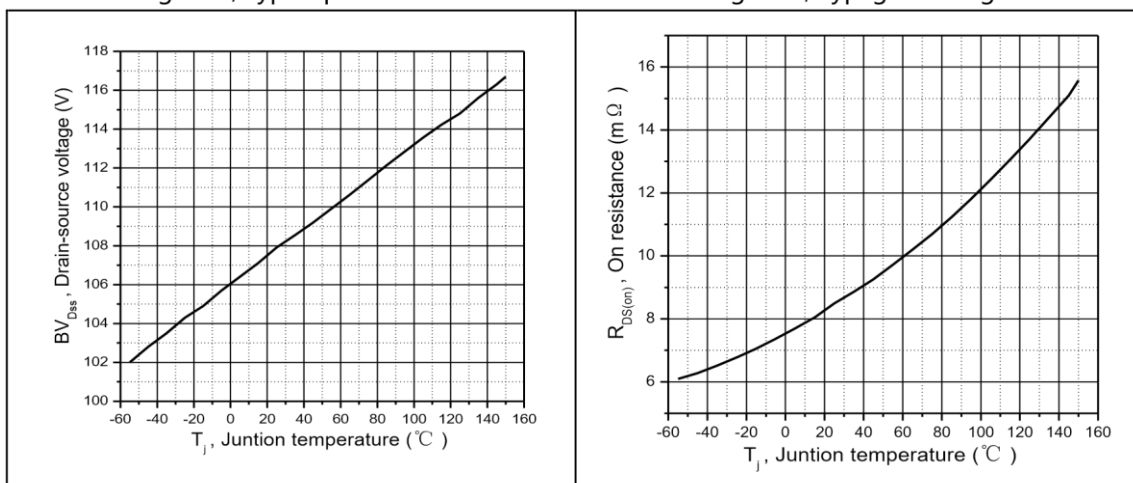


Figure 5, Drain-source breakdown voltage

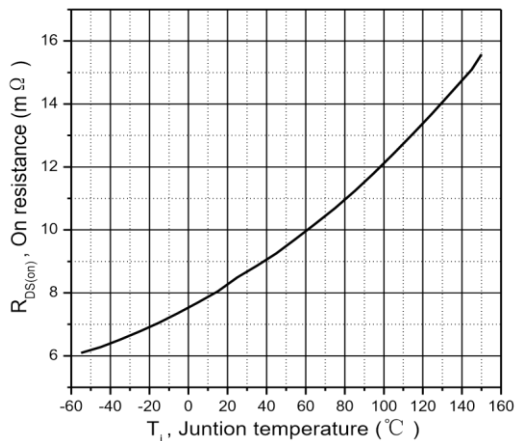


Figure 6, Drain-source on-state resistance

Typical Operating Characteristics (Cont.)

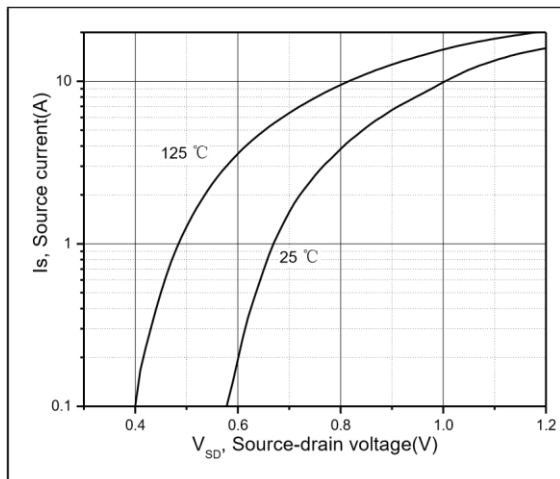


Figure 7, Forward characteristic of body diode

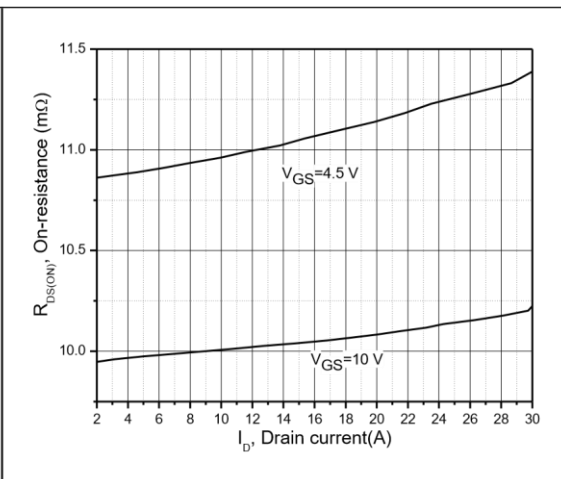


Figure 8, Drain-source on-state resistance

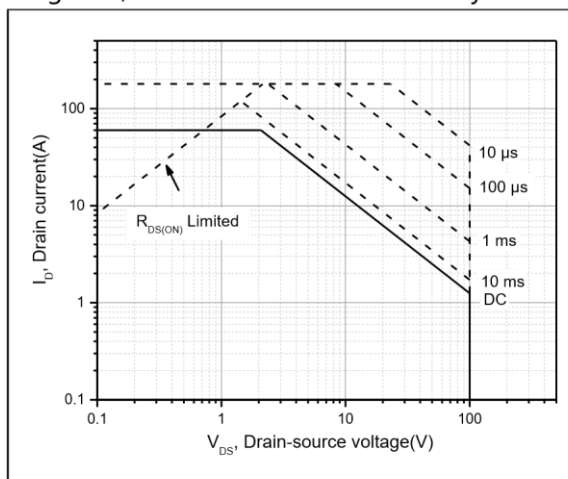


Figure 9, Safe operation area $T_C = 25\text{ }^{\circ}\text{C}$

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