General Description

The WSD65N12GDN56 uses advanced SGT technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

The WSD65N12GDN56 meet the RoHS and Green Product requirement, 100% E_{AS} guaranteed with full function reliability approved.

Product Summery

BV_{DSS}	$R_{DS(ON)}$	I_D
120V	10mΩ	72A

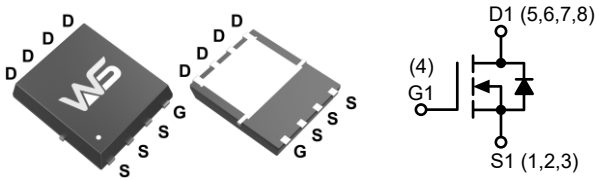
Applications

- Mobile phone fast charging
- Brushless motor
- Home appliance control board

Features

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

DFN5X6-8L Pin Configuration



Absolute Maximum Ratings (T_C=25°C, Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	120	V
V_{GS}	Gate-Source Voltage	±20	
I_D@T_A=25°C	Continuous Drain Current [1], T_C=25°C	72	A
I_D@T_A=70°C	Continuous Drain Current [1], T_C=70°C	35	
I_{DP}	Pulsed Drain Current [2], T_C=25°C	150	
E_{AS}	Single pulsed avalanche energy [4]	50	mJ
P_D	Power Dissipation [3], T_C=25°C	140	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	

Thermal Data

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [5]	---	25	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	0.89	

Electrical Characteristics (T_J=25°C, Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250μA	120	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=30A	---	10	12	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250μA	2.0	3.0	4.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=120V , V_{GS}=0V	---	---	1.0	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Q_g	Total Gate Charge	V_{DS}=50V , V_{GS}=10V , I_D=25A	---	33	---	nC
Q_{gs}	Gate-Source Charge		---	5.6	---	
Q_{gd}	Gate-Drain Charge		---	7.2	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=50V , V_{GS}=10V , R_G=2Ω , I_D=25A	---	22	---	ns
T_r	Rise Time		---	10	---	
$T_{d(off)}$	Turn-Off Delay Time		---	85	---	
T_f	Fall Time		---	112	---	
C_{iss}	Input Capacitance	V_{DS}=50V , V_{GS}=0V , f=1.0MHz	---	2640	---	pF
C_{oss}	Output Capacitance		---	330	---	
C_{rss}	Reverse Transfer Capacitance		---	11	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	50	A
I_{SP}	Pulsed Source Current		---	---	150	
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=12A	---	---	1.3	V
t_{rr}	Reverse Recovery Time	I_F=25A , di/dt=100A/μs , T_J=25°C	---	62.3	---	ns
Q_{rr}	Reverse Recovery Charge		---	135.3	---	nC

Note:

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width. The E_{AS} data shows Max. rating.
3. The power dissipation is limited by 150°C junction temperature.
4. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

Typical Characteristics

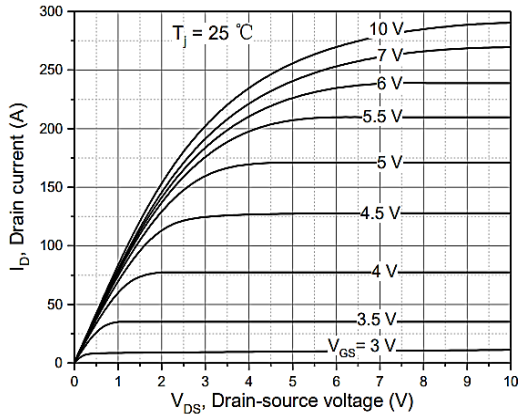


Figure 1. Typ. output characteristics

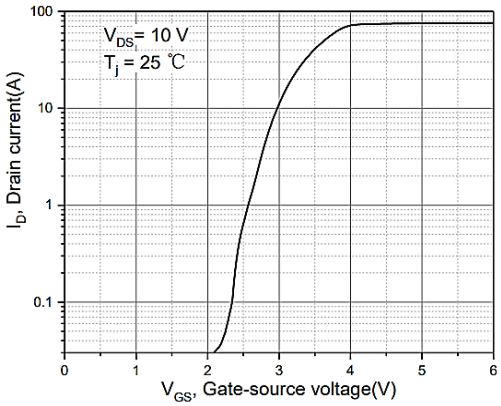


Figure 2. Typ. transfer characteristics

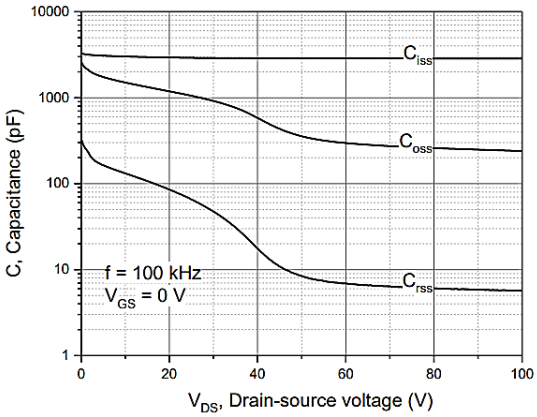


Figure 3. Typ. capacitances

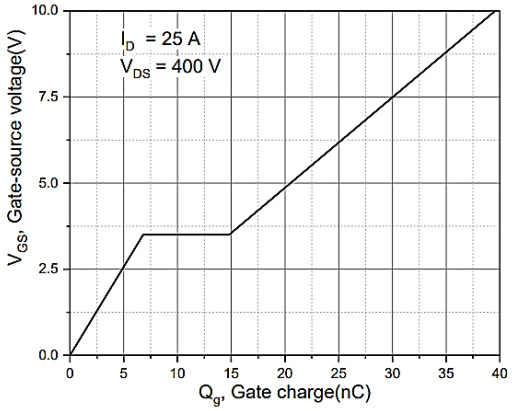


Figure 4. Typ. gate charge

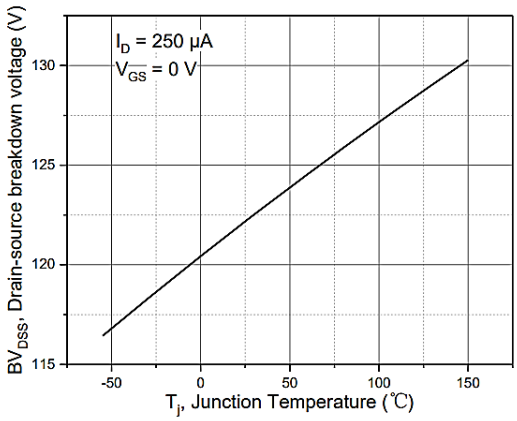


Figure 5. Drain-source breakdown voltage

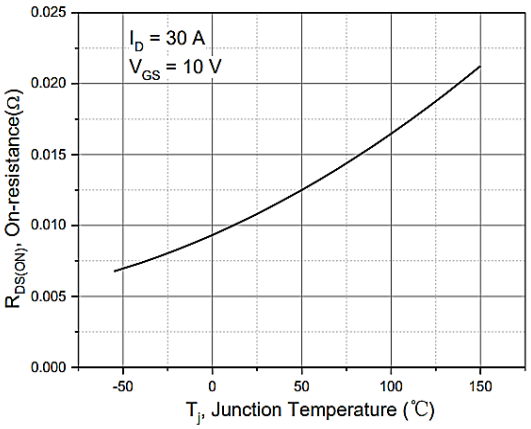


Figure 6. Drain-source on-state resistance

Typical Characteristics (Cont.)

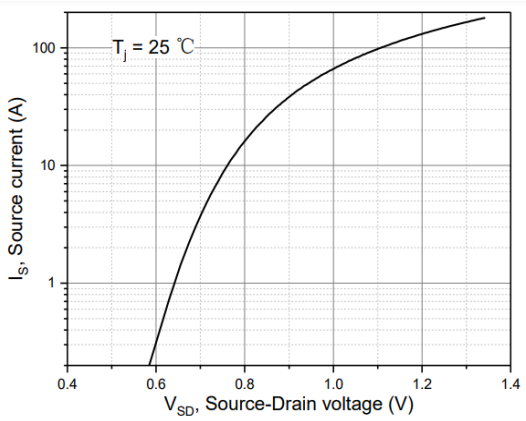


Figure 7. Forward characteristic of body diode

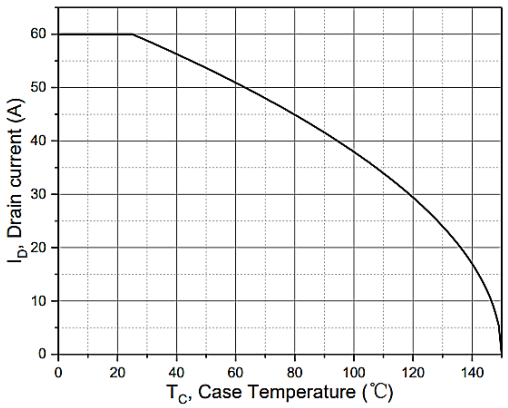


Figure 8. Drain current

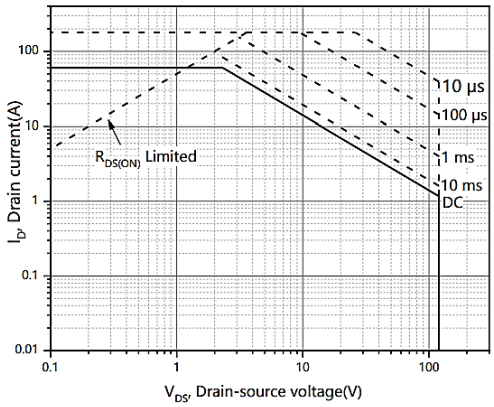
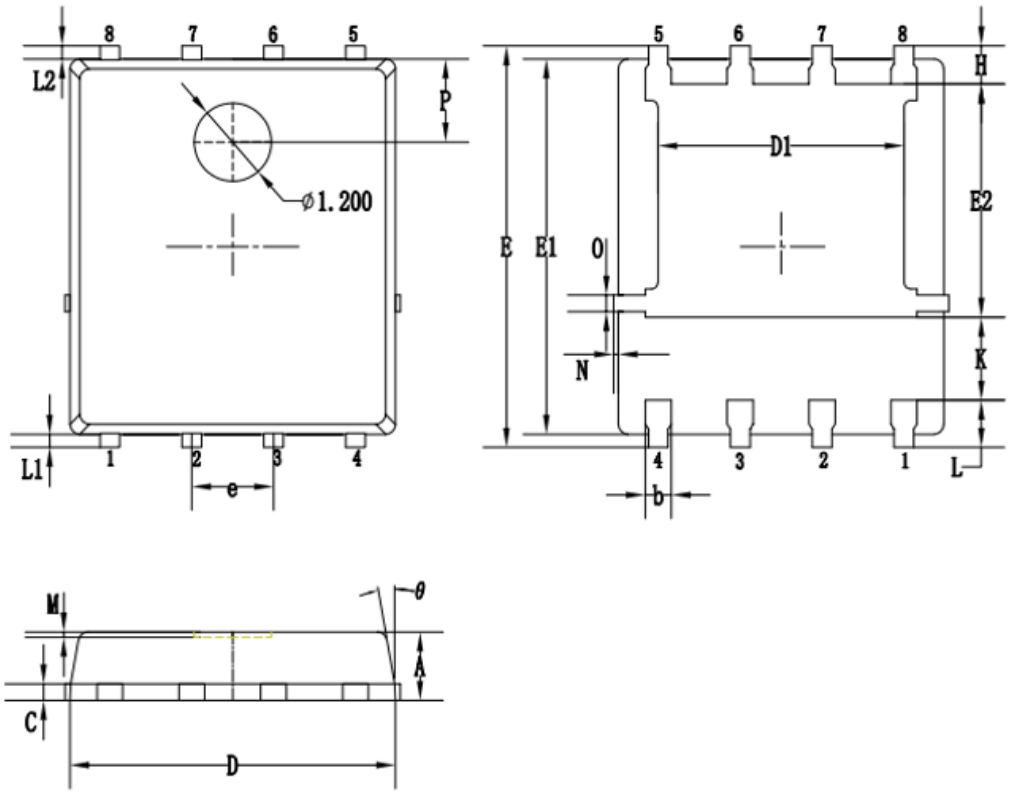


Figure 9. Safe operation area T_C=25 ℃

Packaging information



SYMBOLS	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.05	1.20
b	0.35	0.40	0.50
C	0.20	0.25	0.35
D	4.90	5.05	5.20
D1	3.72	3.82	3.92
E	6.00	6.15	6.30
E1	5.60	5.75	5.90
E2	3.47	3.57	3.67
e	1.27 BSC.		
H	0.48	0.58	0.68
K	1.17	1.27	1.37
L	0.64	0.74	0.84
L1/L2	0.20 REF.		
θ	8°	10°	12°
M	0.08 REF.		
N	0	-	0.15
O	0.25 REF.		
P	1.28 REF.		

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