WSD220N06DN56

N-Channel MOSFET

General Description

The WSD220N06DN56 uses advanced SGT II technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.

The WSD220N06DN56 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
60V	1.0mΩ	220A

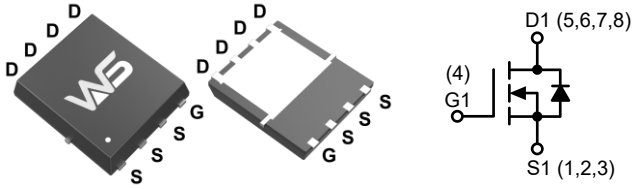
Applications

- Battery protection
- Uninterruptible Power Supply(UPS)

Features

- 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	60	V
V_{GS}	Gate-Source Voltage	±20	
I_D@T_C=25°C	Continuous Drain Current [1,6]	220	A
I_D@T_C=100°C	Continuous Drain Current [1,6]	158	
I_{DM}	Pulsed Drain Current [2]	1340	
E_{AS}	Single Pulse Avalanche Energy [3]	580	mJ
I_{AS}	Avalanche Current	47	A
P_D@T_C=25°C	Power Dissipation [4]	231	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	

Thermal Data

Symbol	Parameter	Rating	Units
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient [1]	55	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case [1]	0.65	

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	60	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance [4]	V_{GS}=10V , I_D=20A	---	1.0	1.3	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250μA	2.0	2.9	4.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=60V , V_{GS}=0V , T_J=25°C	---	---	1.0	μA
		V_{DS}=60V , V_{GS}=0V , T_J=100°C	---	---	100	
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V , V_{GS}=±20V	---	---	±100	nA
g_{fs}	Forward Transconductance [4]	V_{GS}=10V , I_D=20A	---	62	---	S
Q_g	Total Gate Charge	V_{DS}=30V , V_{GS}=10V , I_D=20A	---	102	---	nC
Q_{gs}	Gate-Source Charge		---	24.6	---	
Q_{gd}	Gate-Drain Charge		---	28.2	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=30V , V_{GS}=10V , R_G=3Ω , I_D=20A	---	15.6	---	ns
T_r	Rise Time		---	29	---	
$T_{d(off)}$	Turn-Off Delay Time		---	63	---	
T_f	Fall Time		---	51	---	
C_{iss}	Input Capacitance	V_{DS}=30V , V_{GS}=0V , f=1.0MHz	---	5990	---	pF
C_{oss}	Output Capacitance		---	2257	---	
C_{rss}	Reverse Transfer Capacitance		---	86	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
I_S	Continuous Source Current	T_C=25°C	---	---	378	A
V_{SD}	Diode Forward Voltage [4]	V_{GS}=0V , I_S=20A	---	---	1.2	V
t_{rr}	Reverse Recovery Time	I_F=20A , di/dt=100A/μs	---	80	---	ns
Q_{rr}	Reverse Recovery Charge		---	114	---	μC

Note:

1. The data tested by surface mounted on a 1 inch2 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 175°C junction temperature
4. E_{AS} condition: T_J=25°C, V_{DD}=48V, V_G=10V, R_G=25Ω, L=0.1mH, I_{AS}= 55A
5. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

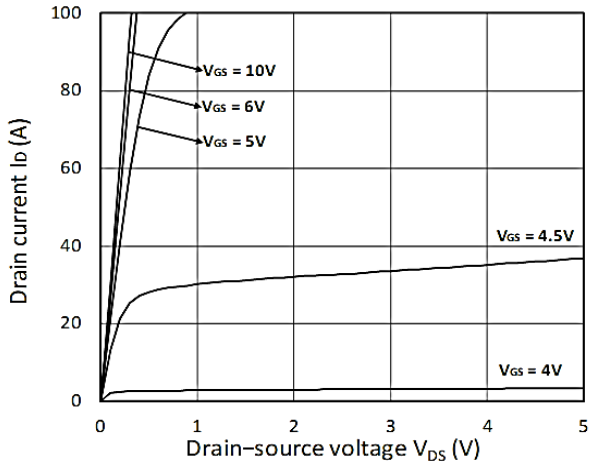


Figure 1. Output Characteristics

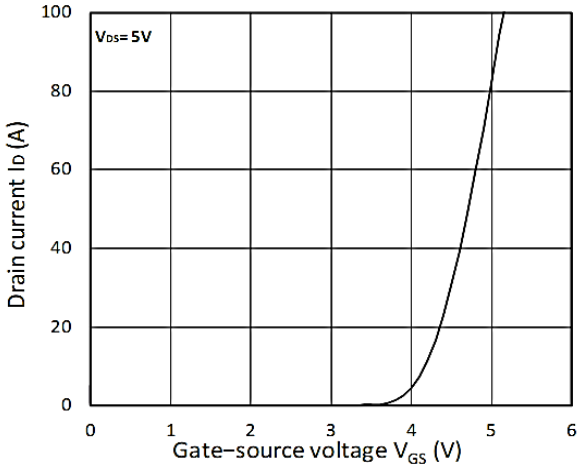


Figure 2. Transfer Characteristics

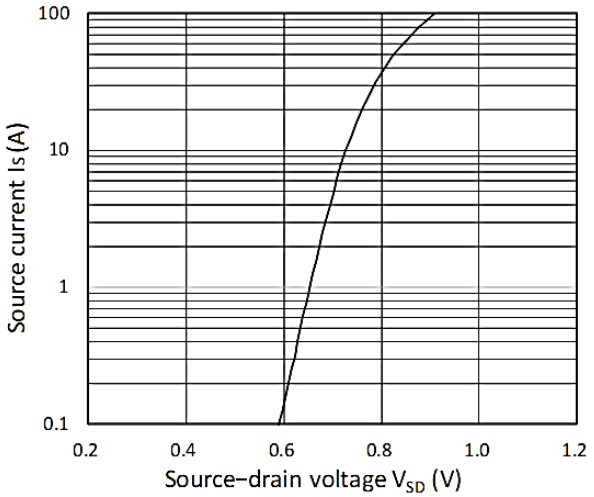


Figure 3. Forward Characteristics of Reverse

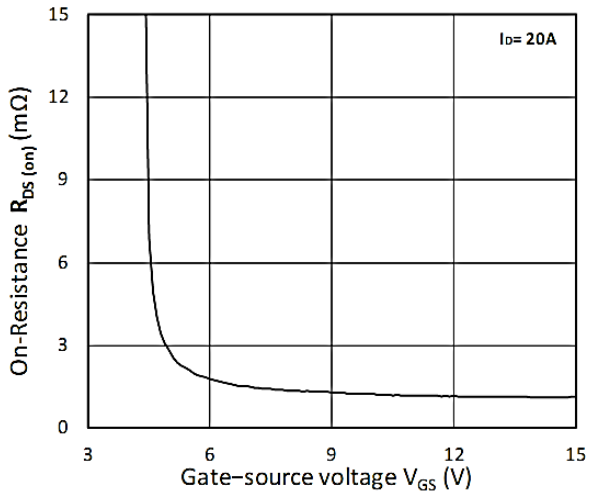


Figure 4. RDS(ON) vs. VGS

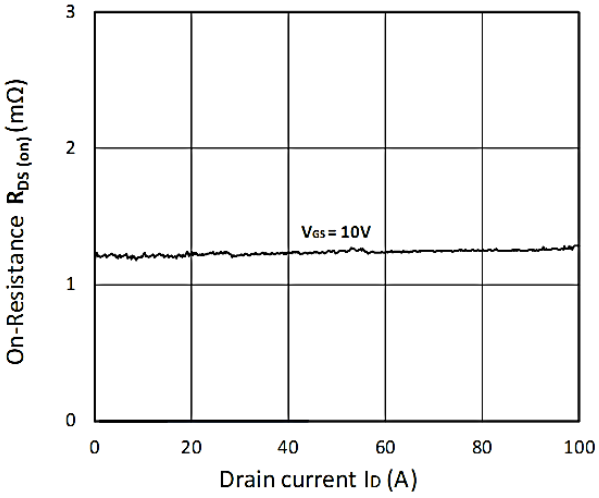


Figure 5. R DS(ON) vs. ID

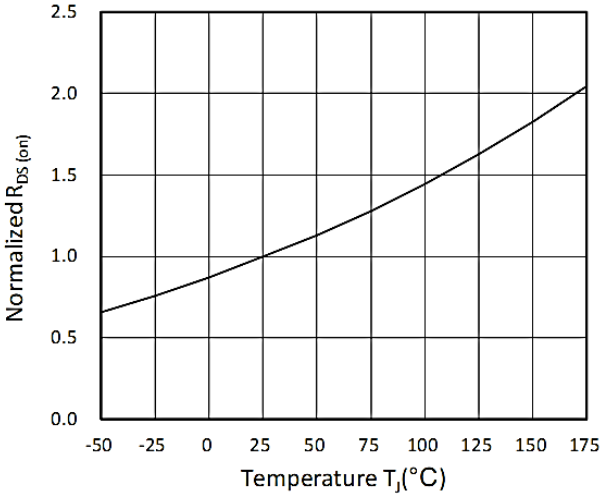


Figure 6. Normalized R DS(on) vs. Temperature

Typical Characteristics (Cont.)

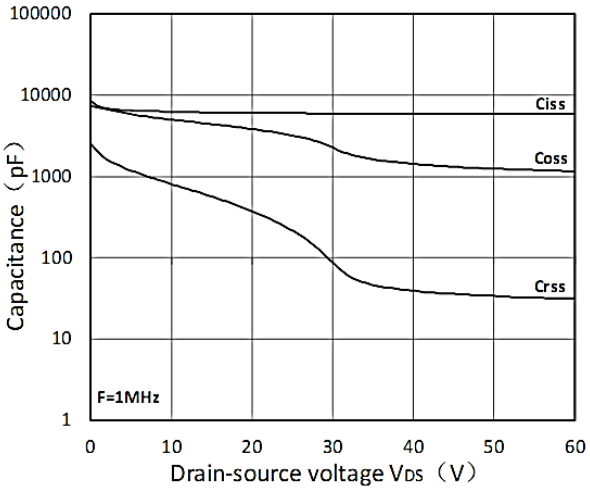


Figure 7. Capacitance Characteristics

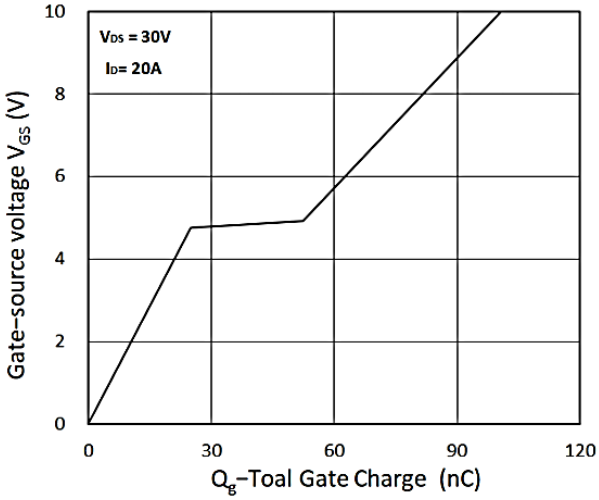


Figure 8. Gate Charge Characteristics

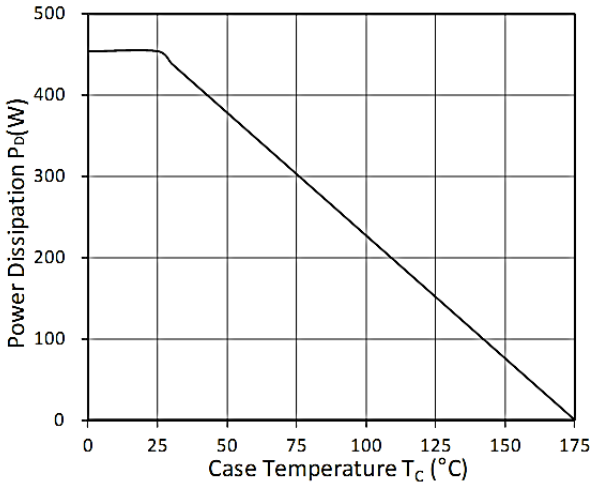


Figure 9. Power Dissipation

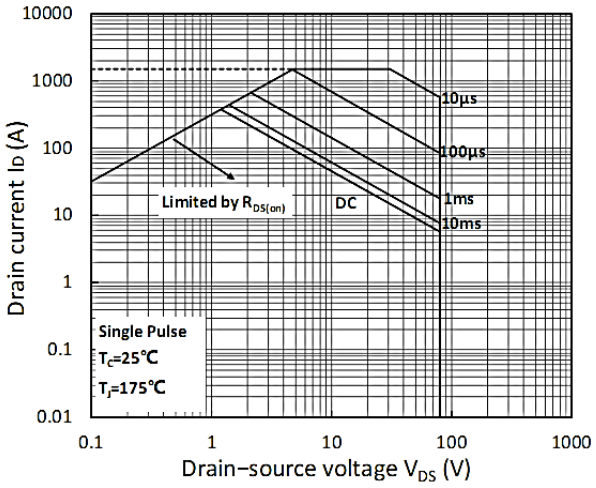


Figure10. Safe Operating Area

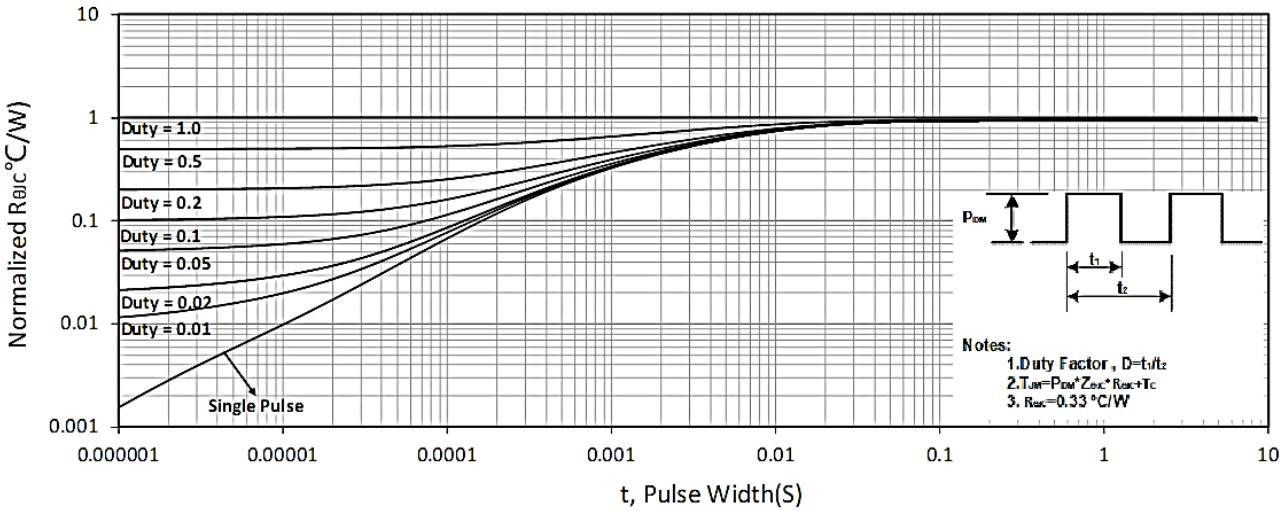
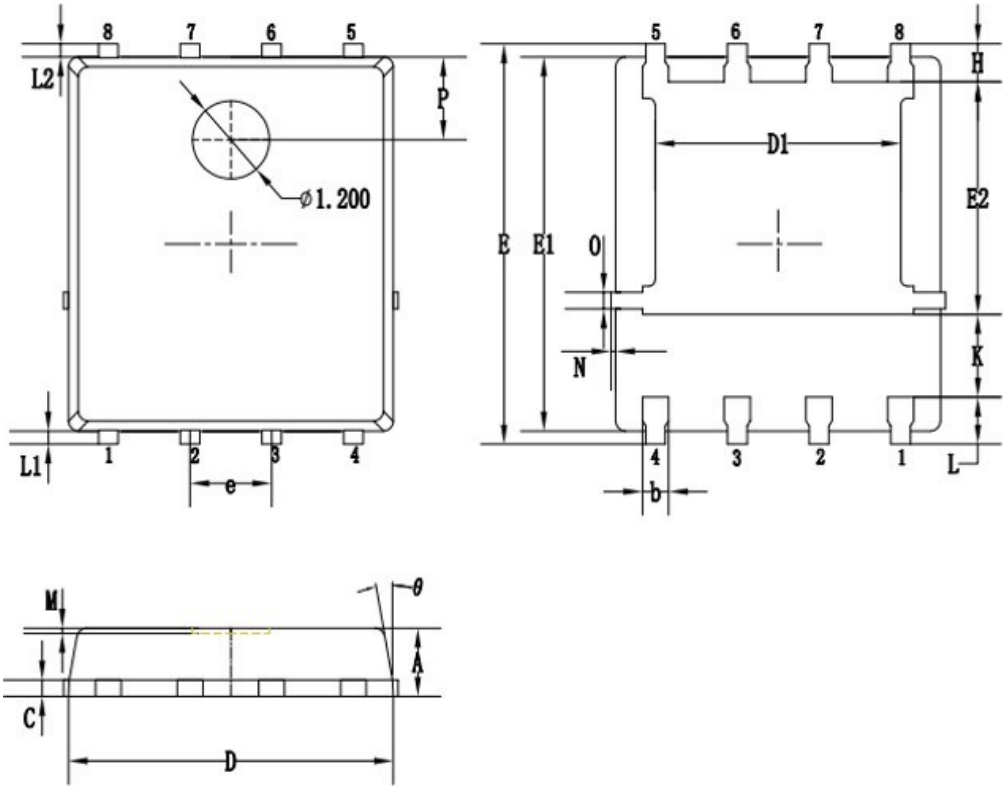


Figure 11. Normalized Maximum Transient Thermal Impedance

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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