General Description

The WSD65N12GDN56 is SGT II technology to provide excellent RDS(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% 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

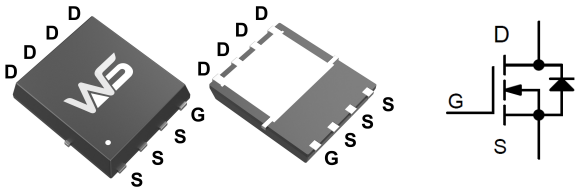
Product Summery

BV_{DSS}	R_{DSON}	I_D
120V	10mΩ	72A

Applications

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

DFN5X6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	120	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current	72	A
I_{DP}	Pulsed Drain Current	150	A
EAS	Avalanche Energy, Single pulse	50	mJ
P_D@T_C=25℃	Total Power Dissipation	140	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	---	25	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	0.89	℃/W

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

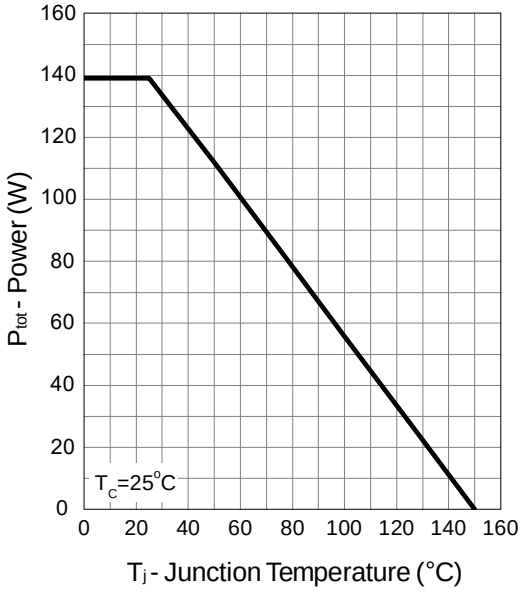
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	120	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V,I_D=10A.	---	10	12	mΩ
		V_{GS}=4.5V,I_D=10A.	---	15	23	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.0	3.0	4.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25℃	---	---	1	uA
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	---	33	---	nC
Q_{gs}	Gate-Source Charge		---	5.6	---	
Q_{gd}	Gate-Drain Charge		---	7.2	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=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=1MHz	---	2640	---	pF
C_{oss}	Output Capacitance		---	330	---	
C_{rss}	Reverse Transfer Capacitance		---	11	---	
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	50	A
I_{SP}	Pulsed Source Current		---	---	150	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=12A , T_J=25℃	---	---	1.3	V
t_{rr}	Reverse Recovery Time	IF=25A,dI/dt=100A/μs,T_J=25℃	---	62	---	nS
Q_{rr}	Reverse Recovery Charge		---	135	---	nC

Note

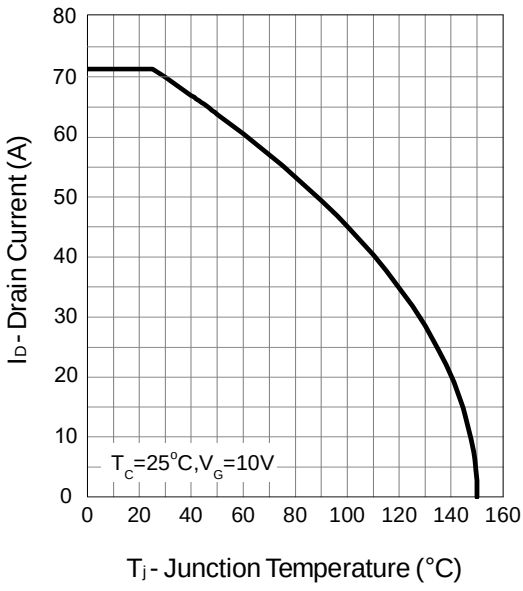
1) Calculated continuous current based on maximum allowable junction temperature.
2) Repetitive rating; pulse width limited by max. junction temperature.
3) Pd is based on max. junction temperature, using junction-case thermal resistance.
4) The value of $R_{\theta JA}$ is measured with the device mounted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

Typical Operating Characteristics

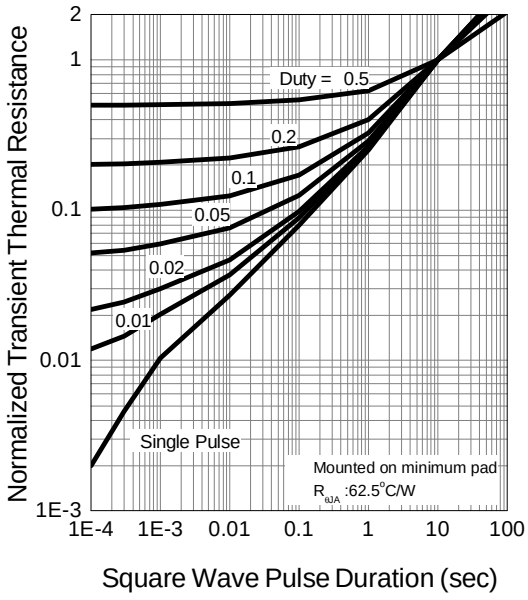
Power Dissipation



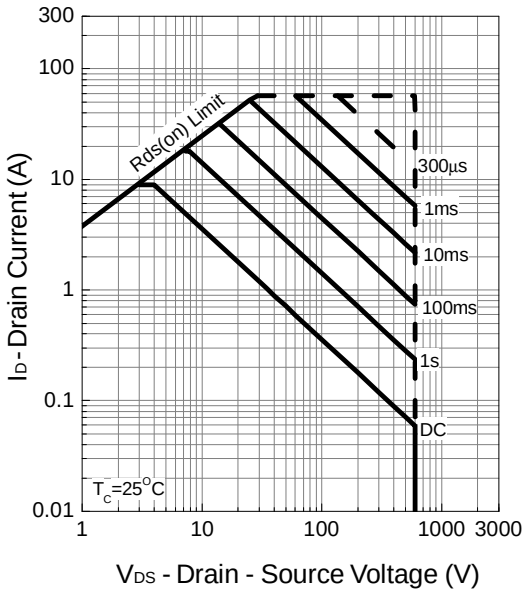
Drain Current



Thermal Transient Impedance:

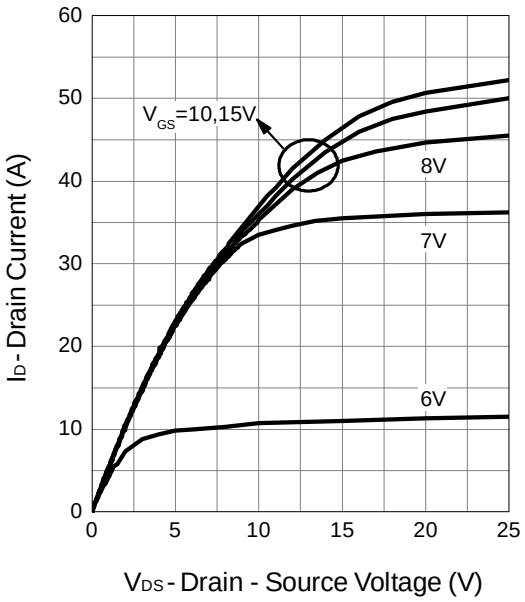


Safe Operation Area

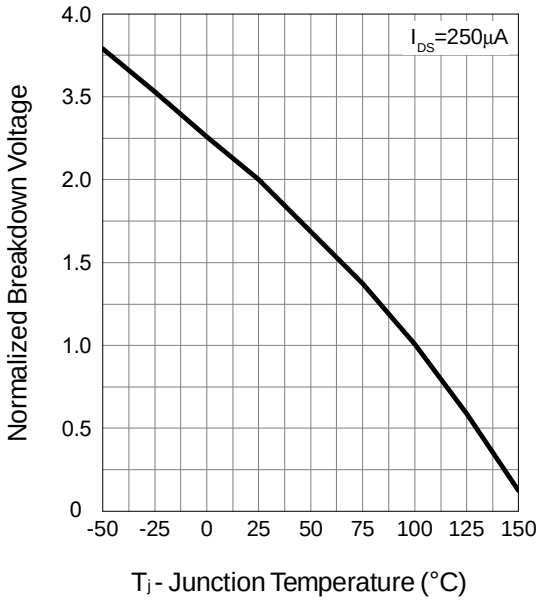


Typical Operating Characteristics

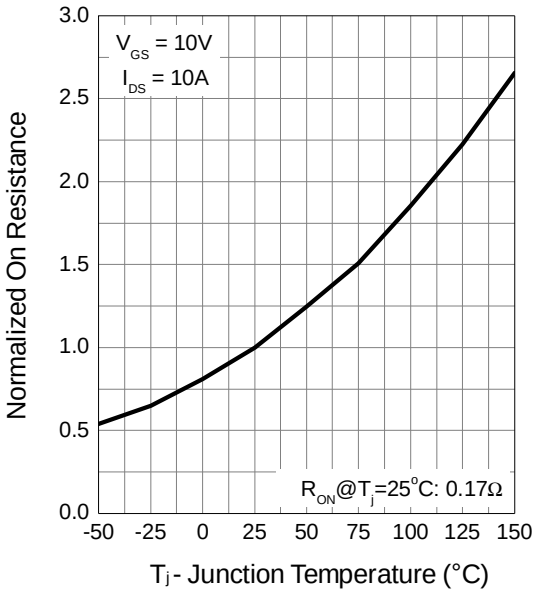
Output Characteristics



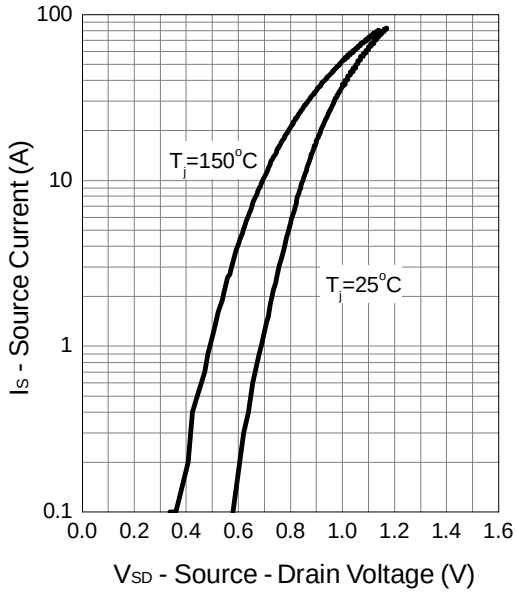
$V_{GS(th)}$ vs Junction Temperature



Drain-Source On Resistance

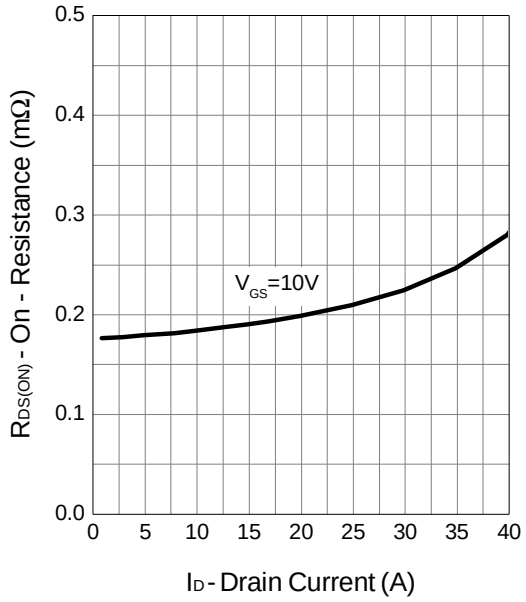


Source-Drain Diode Forward

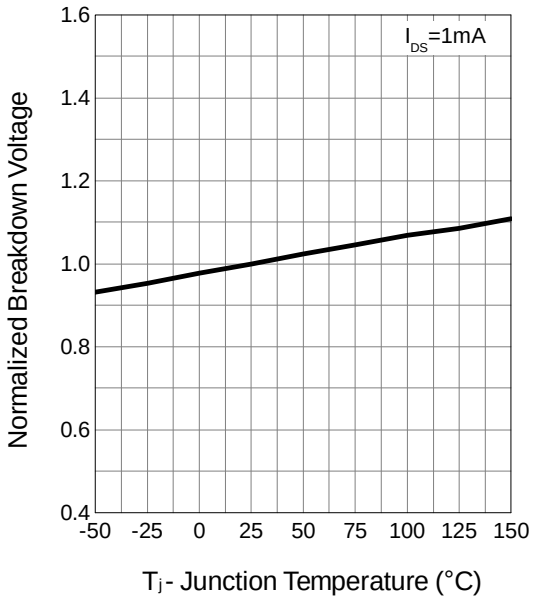


Typical Operating Characteristics

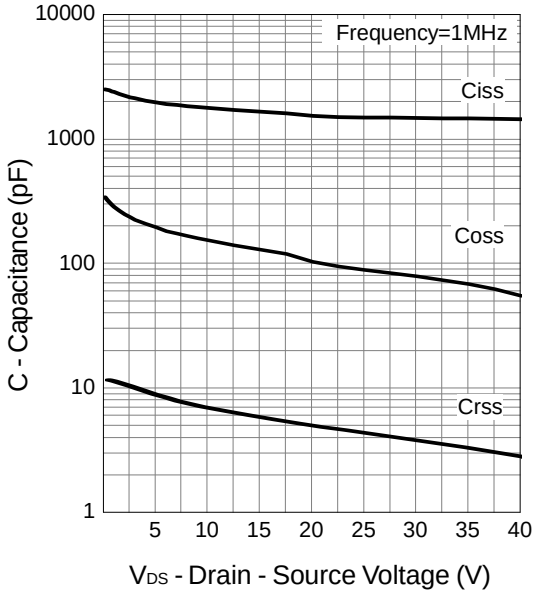
Drain-Source On Resistance



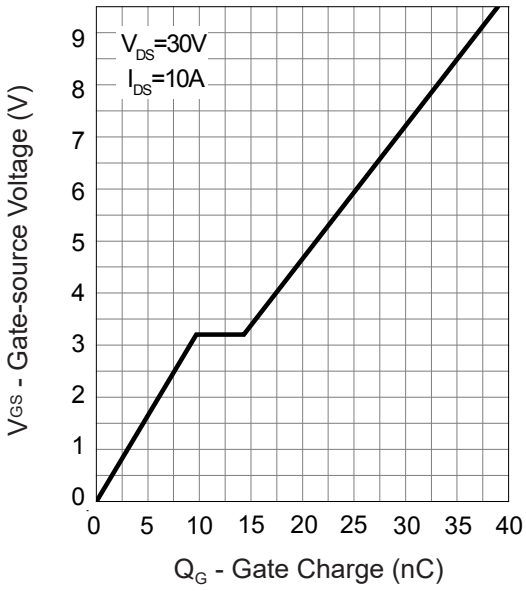
BVDSS vs Junction Temperature



Capacitance



Gate Charge



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