

General Description

The WSK280N06G6 uses advanced 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.

Features

- 100% E_{AS} Guaranteed
- Green Device Available

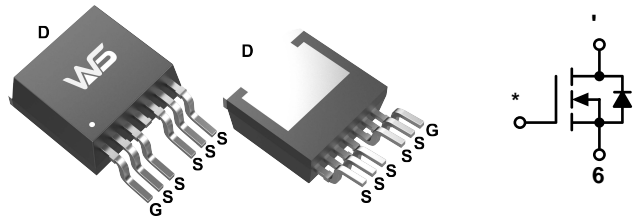
Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D
60V	2.1m Ω	280A

Applications

- Battery protection
- UPS

TO2 /Pin Configuration



Absolute Maximum Ratings ($T_C=25^\circ\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current ^{1,6}	280	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current ^{1,6}	248	
I_{DM}	Pulsed Drain Current ²	240	
E_{AS}	Single Pulse Avalanche Energy ³	101	mJ
I_{AS}	Avalanche Current	55	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	168	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	

Thermal Data

Symbol	Parameter	Rating	Units
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	0.89	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	1.5	

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	---	2.1	3.2	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	2.0	2.8	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-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance ⁴	V _{DS} =5V, I _D =20A	---	78	---	S
R _g	Gate Resistance	f=1.0MHz	---	2.2	---	Ω
Q _g	Total Gate Charge	V _{DS} =30V, V _{GS} =10V, I _D =20A	---	72.5	---	nC
Q _{gs}	Gate-Source Charge		---	19.5	---	
Q _{gd}	Gate-Drain Charge		---	14	---	
T _{d(on)}	Turn-on Delay Time	V _{DD} =30V, V _{GS} =10V, R _G =3Ω, I _D =20A	---	26.5	---	ns
T _r	Rise Time		---	15	---	
T _{d(off)}	Turn-off Delay Time		---	73	---	
T _f	Fall Time		---	18	---	
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1.0MHz	---	5245	---	pF
C _{oss}	Output Capacitance		---	1090	---	
C _{rss}	Reverse Transfer Capacitance		---	25	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
I _S	Continuous Source Current	T _C =25°C	---	---	125	A
V _{SD}	Diode Forward Voltage ⁴	I _S =20A, V _{GS} =0V	---	---	1.2	V
t _{rr}	Reverse Recovery Time	I _F =20A, di/dt=100A/μs	---	25	---	ns
Q _{rr}	Reverse Recovery Charge		---	90	---	nC

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 150°C junction temperature.
4. E_{AS} condition: T_J=25°C, V_{DD}=48V, V_{GS}=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

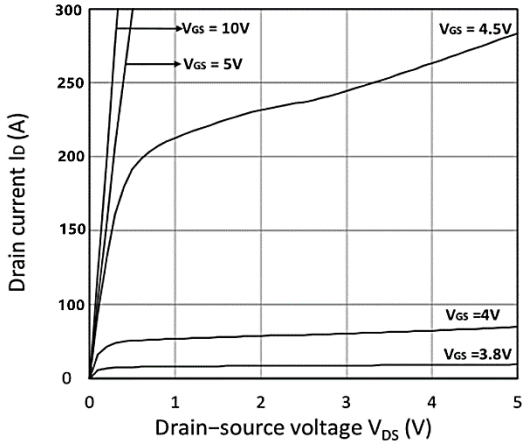


Figure 1. Output Characteristics

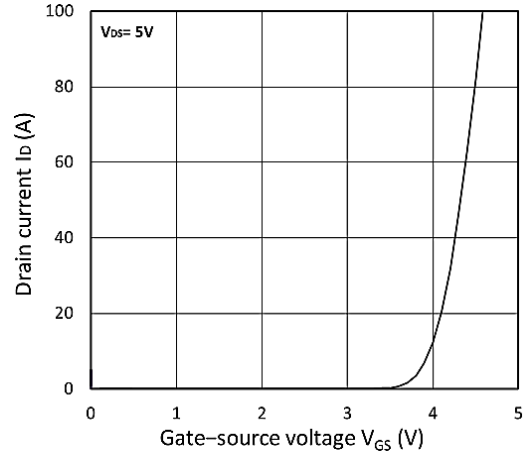


Figure 2. Transfer Characteristics

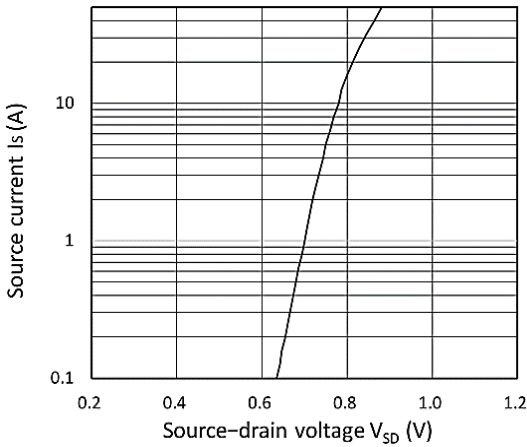


Figure 3. Forward Characteristics of Reverse

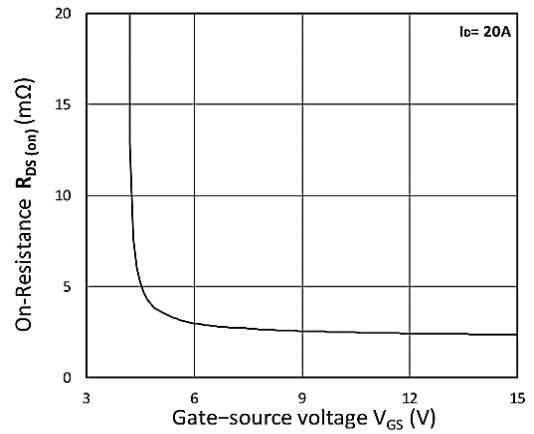


Figure 4. RDS(ON) vs. VGS

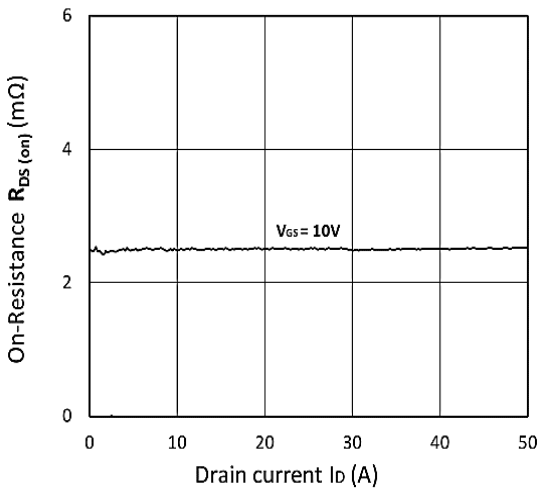


Figure 5. R DS(ON) vs. ID

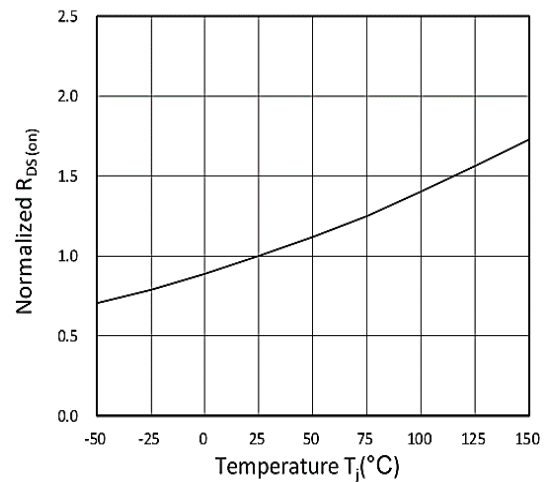


Figure 6. Normalized R DS(on) vs. Temperature

Typical Characteristics (Cont.)

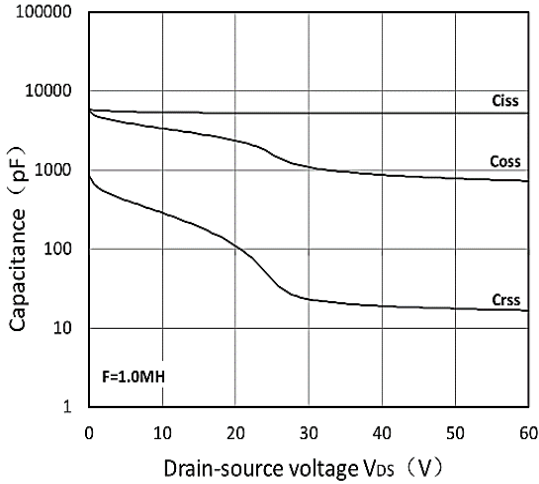


Figure 7. Capacitance Characteristics

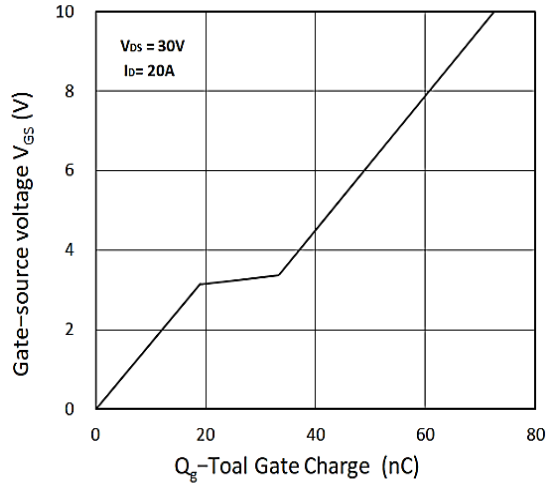


Figure 8. Gate Charge Characteristics

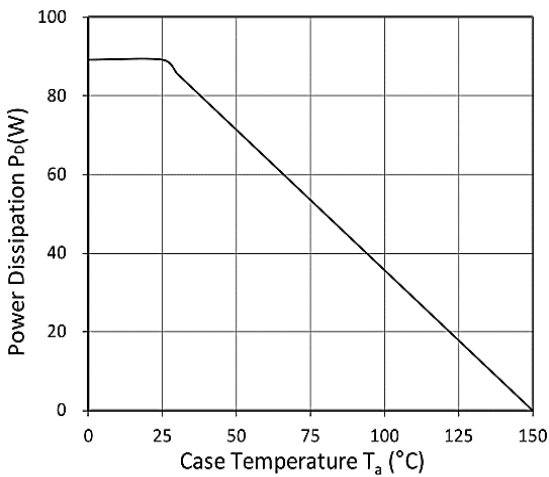


Figure 9. Power Dissipation

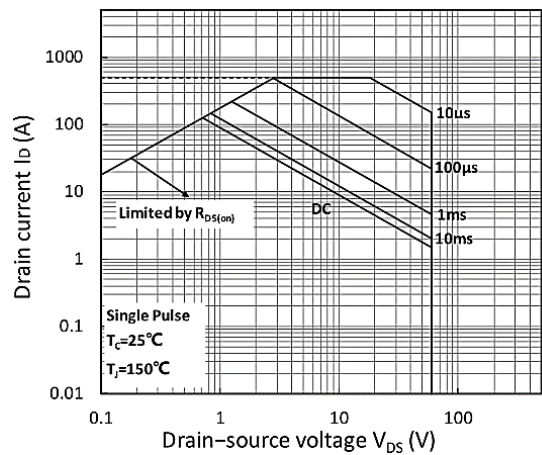


Figure 10. Safe Operating Area

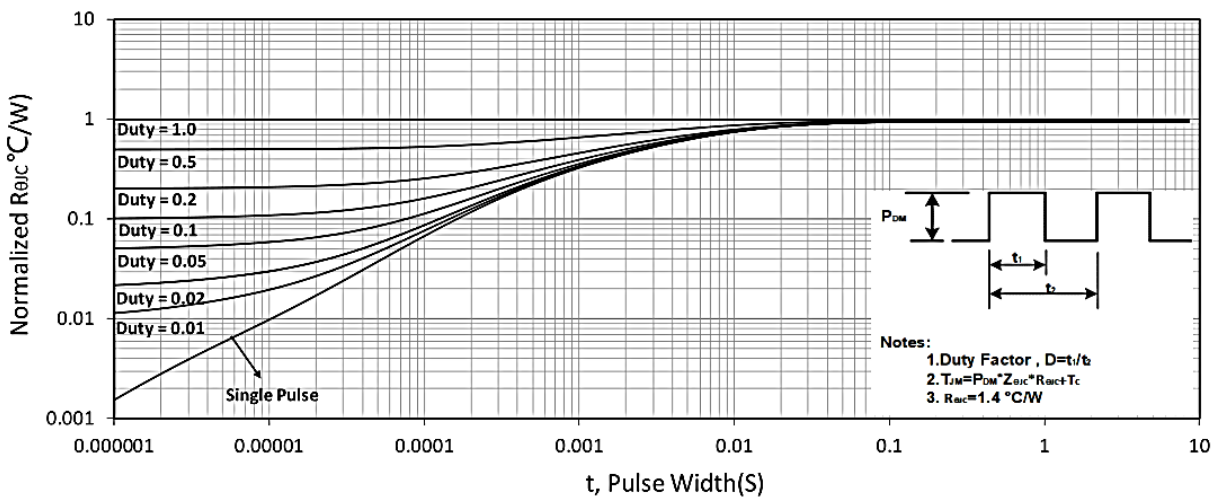
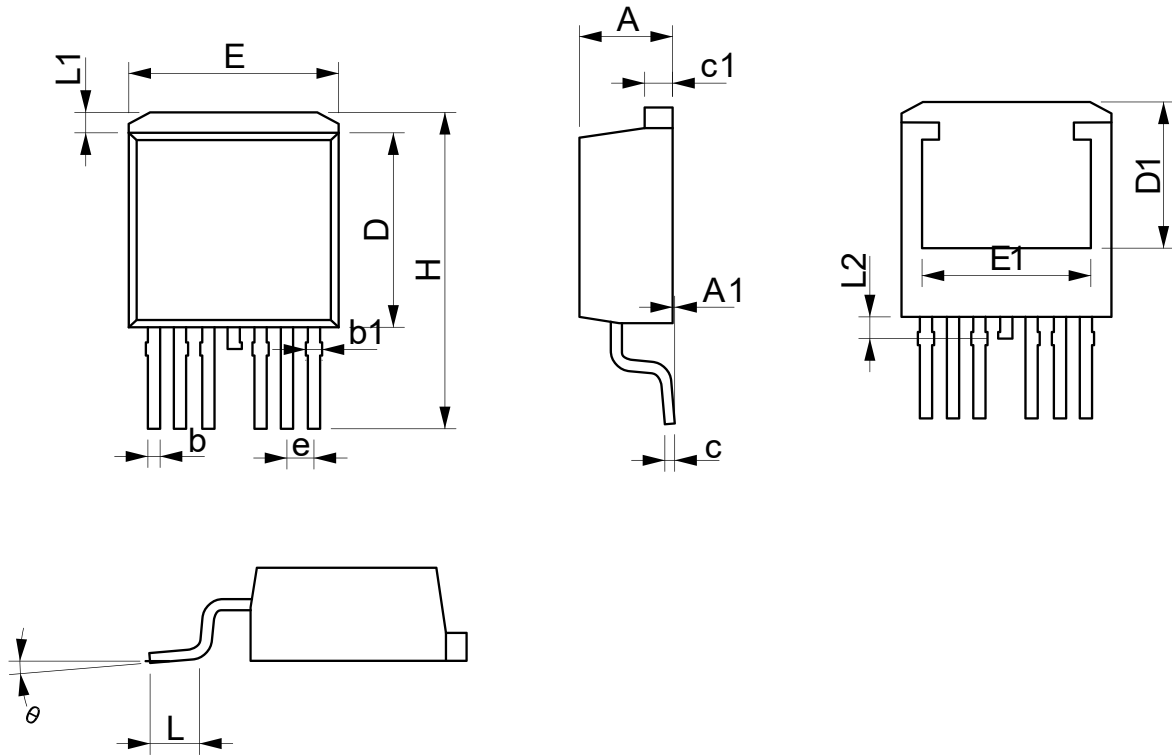


Figure 11. Normalized Maximum Transient Thermal Impedance

Packaging information


SYMBOL	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.25	4.55	0.167	0.179
A1	0.01	0.25	0.000	0.010
b	0.50	0.70	0.020	0.028
b1	0.60	0.84	0.024	0.033
c	0.40	0.60	0.016	0.024
c1	1.20	1.40	0.047	0.055
D	9.05	9.45	0.356	0.372
D1	6.90	9.00	0.272	0.354
E	9.80	10.20	0.386	0.402
E1	7.25	9.00	0.285	0.354
e	1.27 BSC		0.05 BSC	
H	14.65	15.35	0.577	0.604
L	2.40	3.00	0.094	0.118
L1	0.80	1.20	0.031	0.047
L2	0.85	1.15	0.330	0.045
θ	2°	8°	2°	8°

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