General Description

The WSF70N10G uses advanced SGT-II 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.

Features

- advanced SGTMOS technology Super Low Gate Charge
- Low gate charge
- Low RDS(ON)

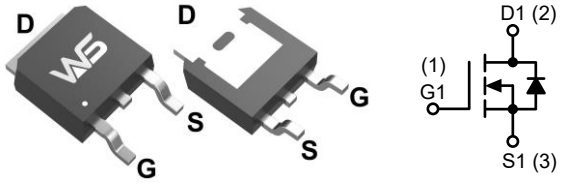
Product Summery

BV_{DSS}	$R_{DS(ON)}$	I_D
100V	9mΩ	65A

Applications

- DC/DC Converter
- LED Backlighting
- Power Management Switches

TO-252-2L Pin Configuration



Absolute Maximum Ratings (Tc = 25℃, unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	
I_D@T_C=25°C	Continuous Drain Current, V_{GS} @ 10V	65	A
I_D@T_C=100°C	Continuous Drain Current, V_{GS} @ 10V	40	
I_{DM}	Pulsed Drain Current	252	
E_{AS}	Single Pulse Avalanche Energy	286	mJ
I_{AS}	Avalanche Current	24	A
P_D@T_C=25°C	Total Power Dissipation [4]	83	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-to-Ambient	---	1.5	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	---	62.5	

Electrical Characteristics (T_C = 25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250μA	100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=10A	---	9	12	mΩ
		V_{GS}=4.5V , I_D=6A	---	11	15	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250μA	1.2	1.6	2.5	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V , V_{GS}=0V	---	---	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
g_{fs}	Forward Transconductance	V_{DS}=5V , I_D=20A	---	48	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f = 1.0MHz	---	2.0	---	Ω
Q_g	Total Gate Charge (@V_{GS} = 10V)	V_{DS}=50V , V_{GS}=0 to 10V , I_D=10A	---	21	---	nC
Q_g	Total Gate Charge (@V_{GS} = 6V)		---	13.9	---	
Q_{gs}	Gate-Source Charge		---	5.4	---	
Q_{gd}	Gate-Drain Charge		---	5.5	---	
$T_{d(on)}$	Turn-On Delay Time	V_{GS}=10V , V_{DS}=50V , R_{GEN}=6Ω , R_L=2.5Ω	---	10.7	---	ns
T_r	Rise Time		---	20	---	
$T_{d(off)}$	Turn-Off Delay Time		---	19.5	---	
T_f	Fall Time		---	25	---	
C_{iss}	Input Capacitance	V_{DS}=50V , V_{GS}=0V , f = 1.0MHz	---	1372	---	pF
C_{oss}	Output Capacitance		---	291	---	
C_{rss}	Reverse Transfer Capacitance		---	2.0	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
I_S	Diode Continuous Current	T_C = 25°C	---	---	63	A
I_{SM}	Pulsed Source Curren		---	---	38	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A	---	0.7	1.0	V
t_{rr}	Body Diode Reverse Recovery Time	I_F=20A, dIF/dt=100A/μs	---	48	---	ns
Q_{rr}	Body Diode Reverse Recovery Charge		---	79	---	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 ≤ 300us , duty cycle ≤ 2%

3.The EAS data shows Max. rating . The test condition is V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=24A

4.The power dissipation is limited by 150°C junction temperature

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

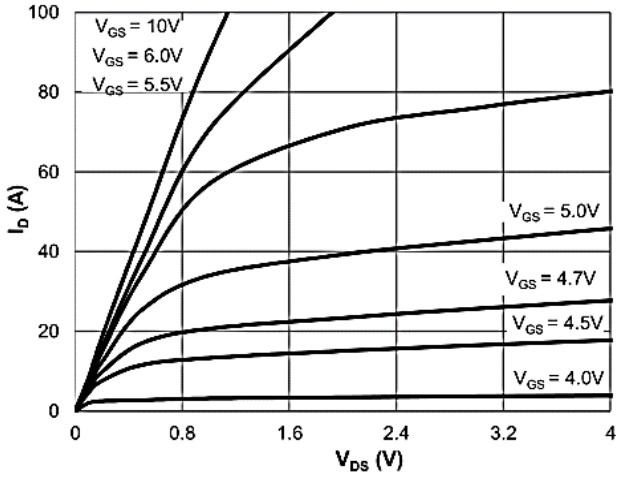


Figure 1: Saturation Characteristics

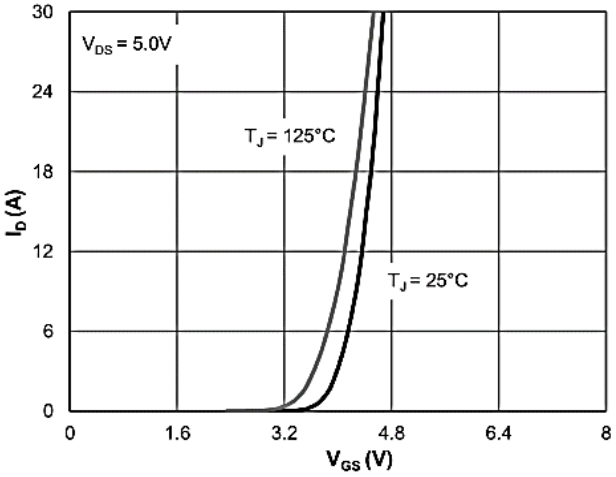


Figure 2: Transfer Characteristics

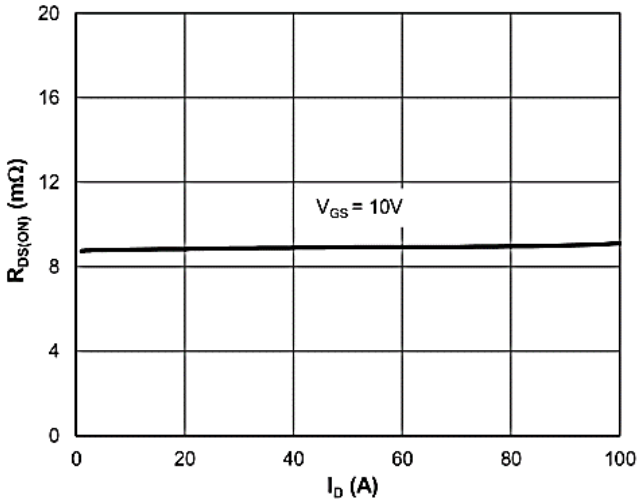


Figure 3: $R_{DS(ON)}$ vs. Drain Current

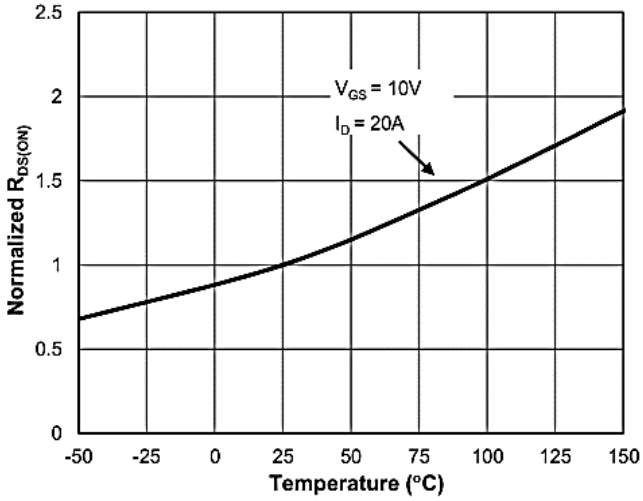


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

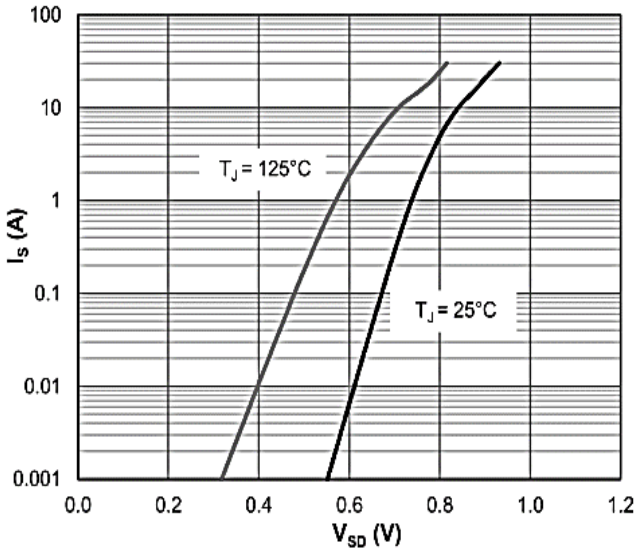


Figure 5: Body-Diode Characteristics

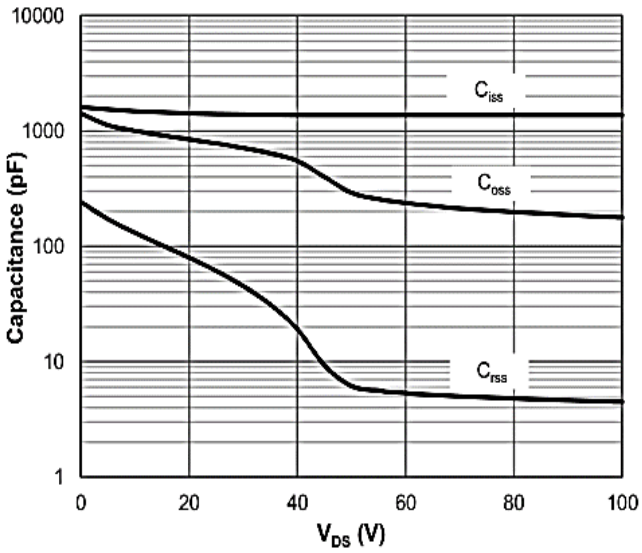
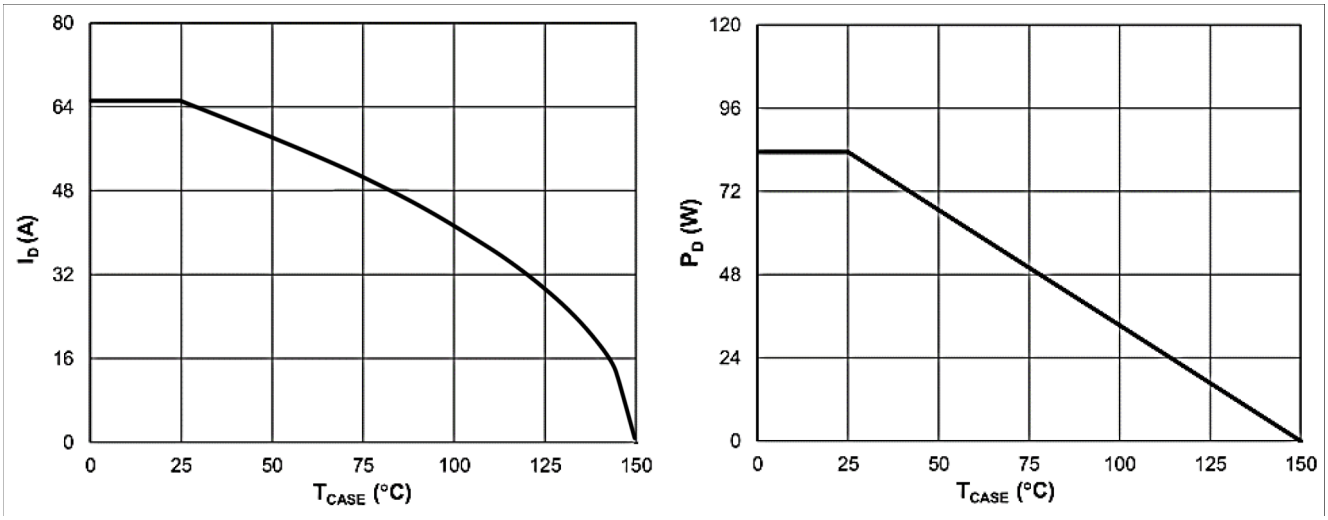


Figure 6: Capacitance Characteristics

Typical Characteristics (Cont.)



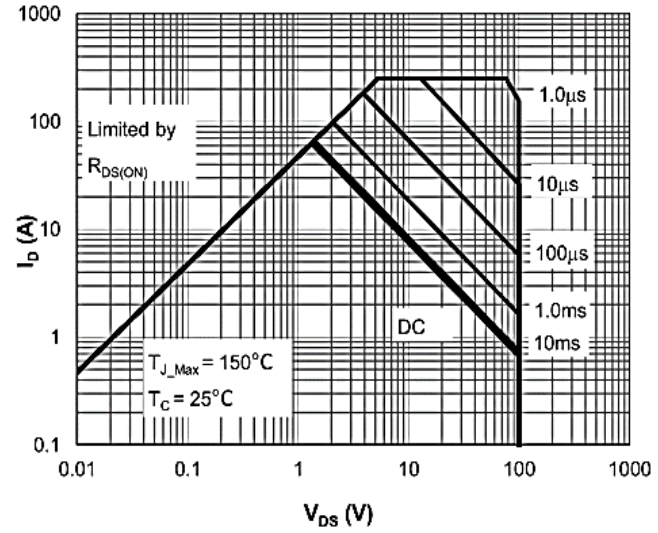


Figure 9: Maximum Safe Operating Area

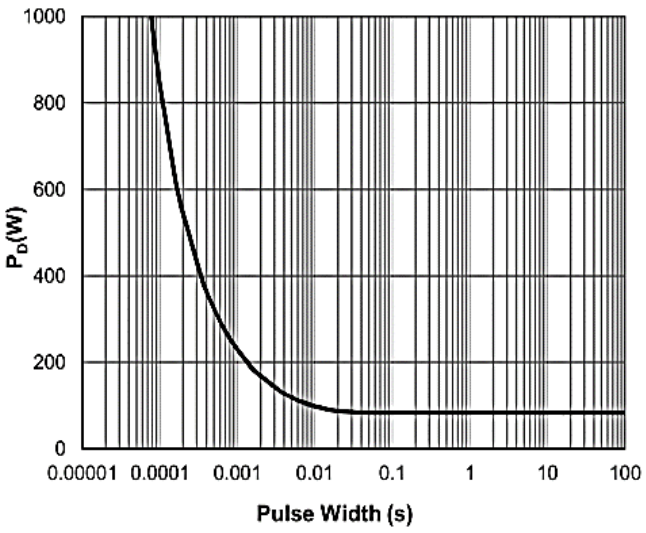


Figure 10: Single Pulse Power Rating, Junction-to-Case

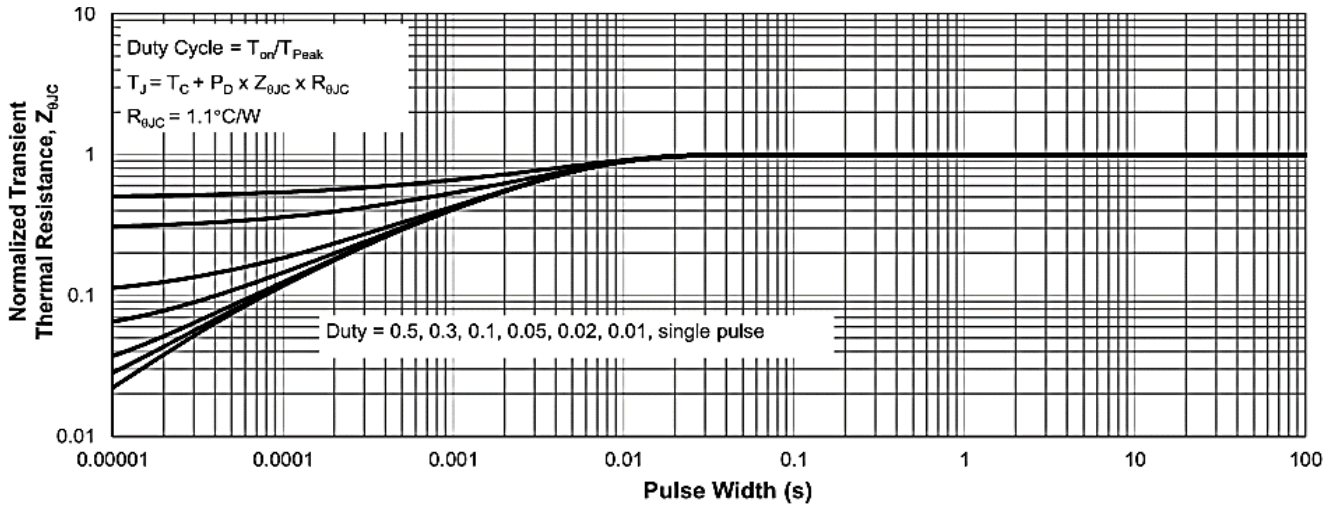
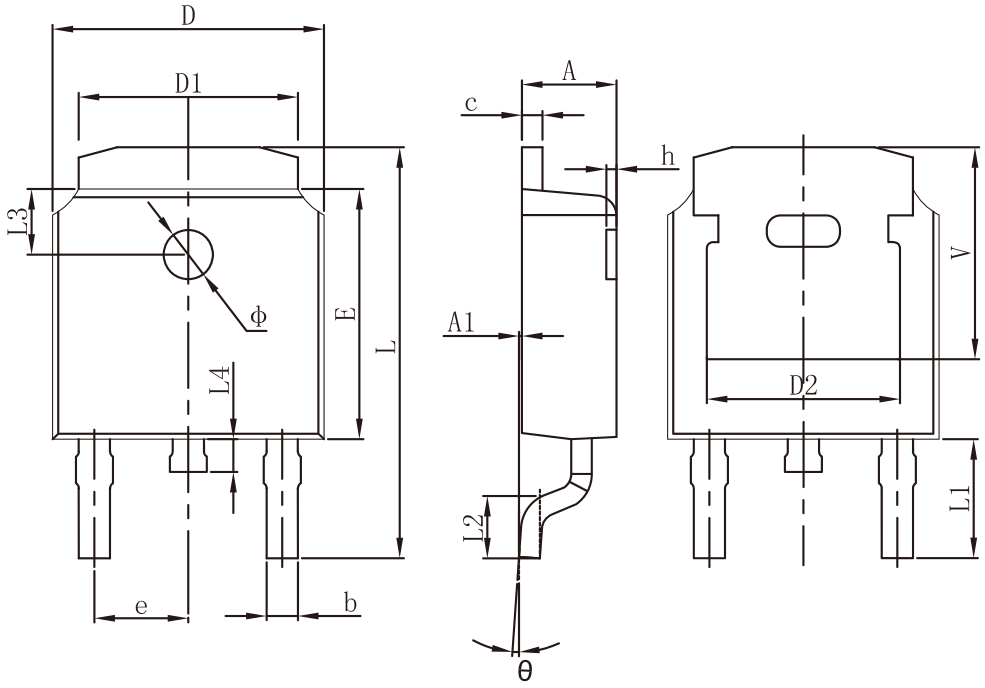


Figure 11: Normalized Maximum Transient Thermal Impedance

Packaging information



SYMBOL	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	

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