

General Description

The WSK78P10 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.

Features

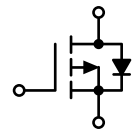
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Green Device Available

Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D
-100V	19m Ω	-78A

Applications

- Brushless motor
- Load switch.
- Uninterruptible power supply



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	± 20	
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ -10V$ ¹	-78	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ -10V$ ¹	-56	
I_{DM}	Pulsed Drain Current ²	-300	
E_{AS}	Single Pulse Avalanche Energy ³	174	mJ
I_{AS}	Avalanche Current	-50	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	280	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	62	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-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	-100	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-20A	---	19	25	mΩ
		V _{GS} =-4.5V, I _D =-10A	---	25	30	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250μA	-1.0	-1.6	-2.5	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-100V, V _{GS} =0V	---	---	-1.0	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
Q _g	Total Gate Charge	V _{DS} =-50V, V _{GS} =-10V, I _D =-5A	---	80	---	nC
Q _{gs}	Gate-Source Charge					
Q _{gd}	Gate-Drain Charge					
T _{d(on)}	Turn-on Delay Time	V _{DD} =-50V, V _{GS} =-10V, R _G =6Ω, I _D =-5A	---	26	---	ns
T _r	Rise Time					
T _{d(off)}	Turn-off Delay Time					
T _f	Fall Time					
C _{iss}	Input Capacitance	V _{DS} =-50V, V _{GS} =0V, f=1.0MHz	---	4230	---	pF
C _{oss}	Output Capacitance					
C _{rss}	Reverse Transfer Capacitance					

Diode Characteristics

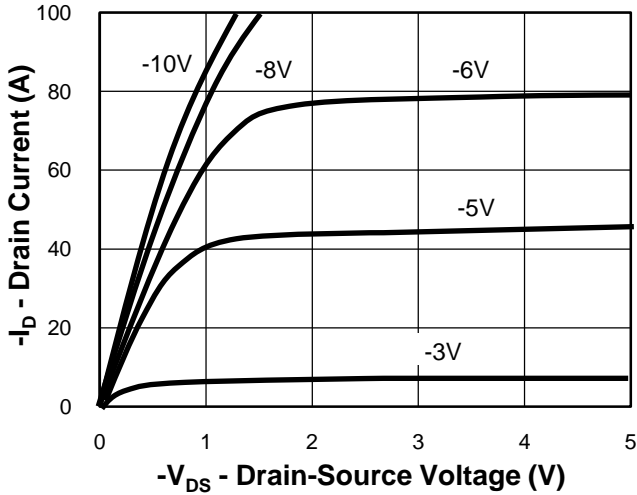
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	-80	A
I _{SM}	Pulsed Source Current		---	---	280	
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-30A	---	---	-1.2	V
t _{rr}	Reverse Recovery Time	I _F =-5A, di/dt=100A/μs, T _J =25°C	---	208	---	ns
Q _{rr}	Reverse Recovery Charge		---	560	---	nC

Note:

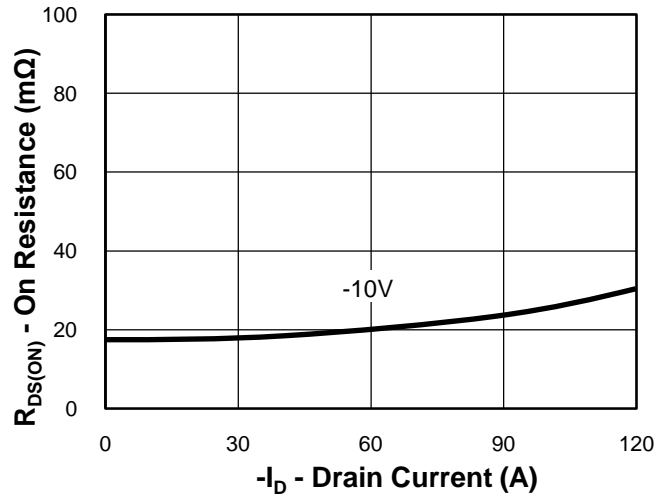
1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%.
3. The E_{AS} data shows Max. rating. The test condition is V_{DD}=-72V, V_{GS}=-10V, L=0.1mH, I_{AS}=-50A
4. The power dissipation is limited by 150°C junction 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

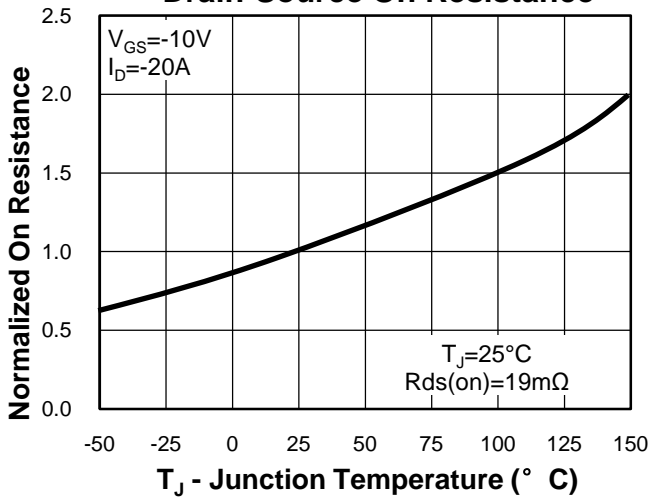
Output Characteristics



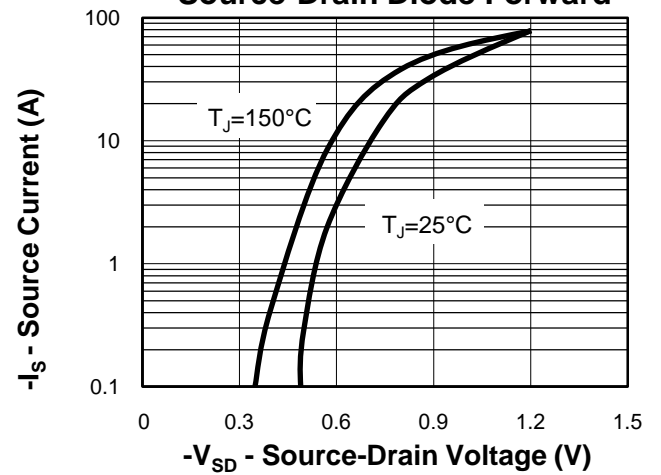
Drain-Source On Resistance



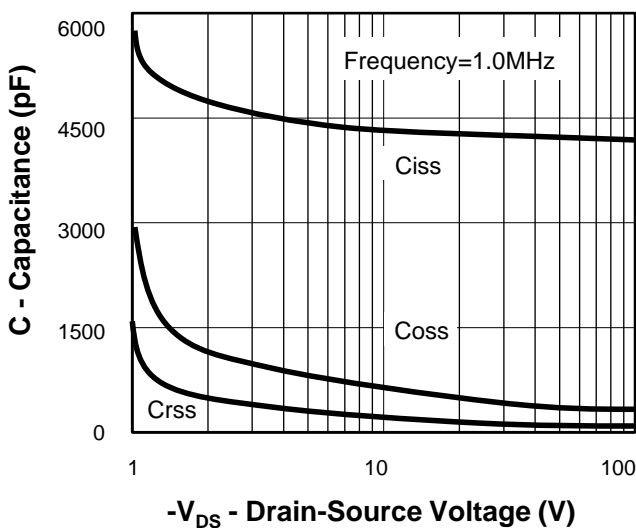
Drain-Source On Resistance



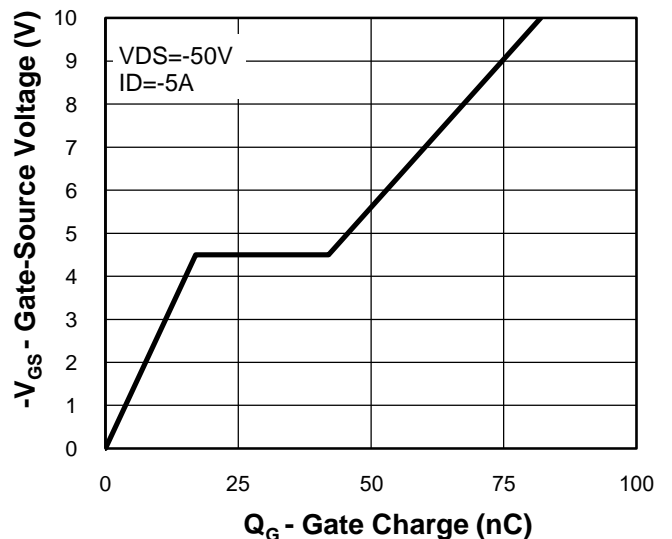
Source-Drain Diode Forward



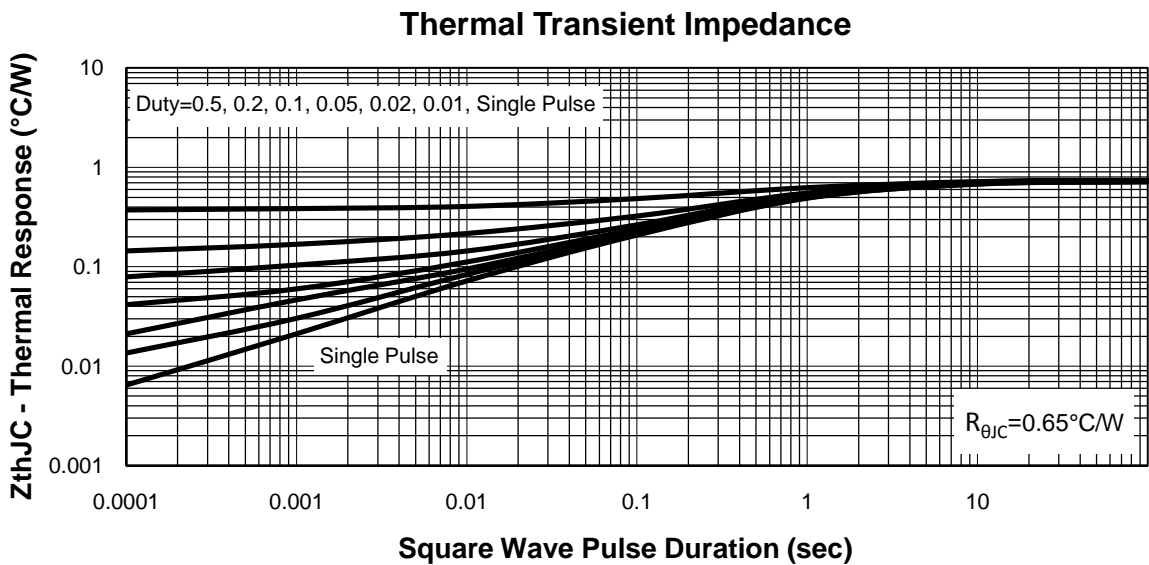
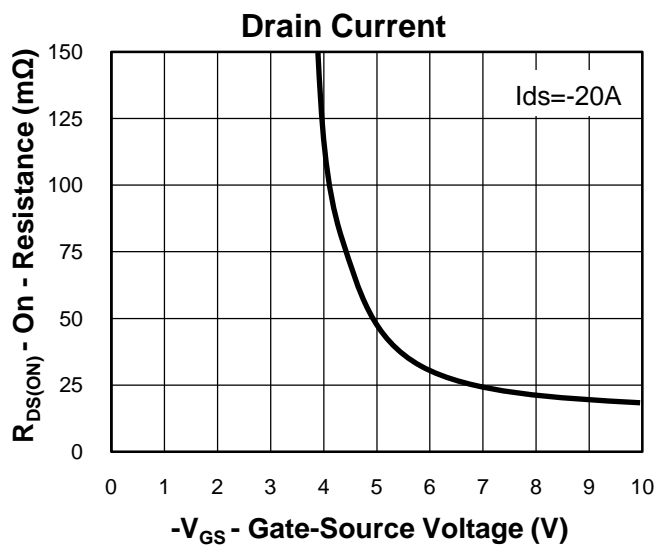
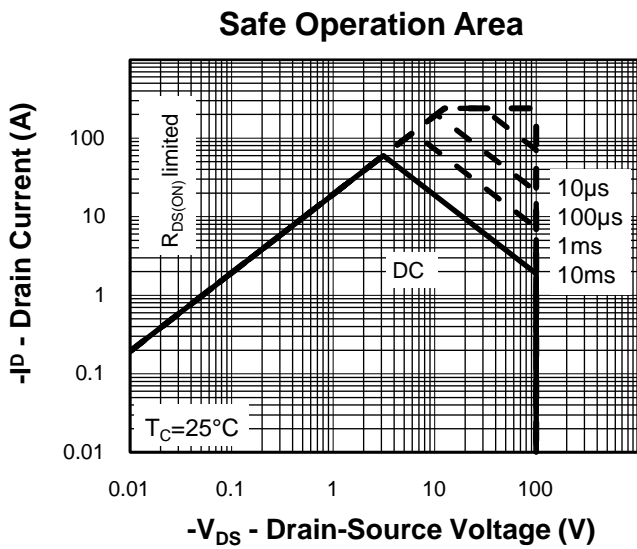
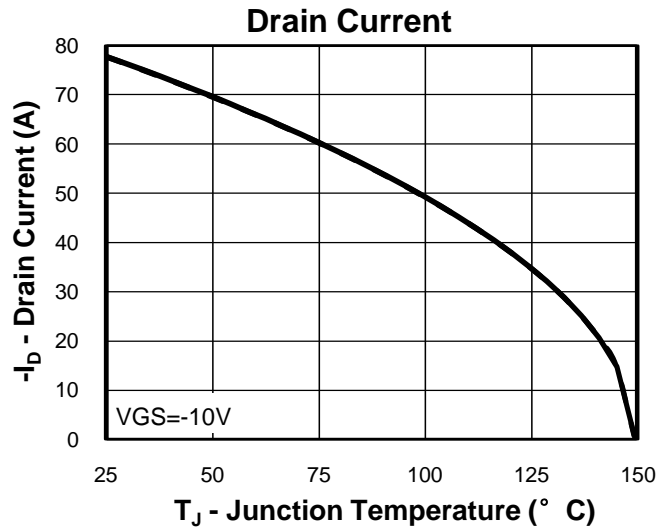
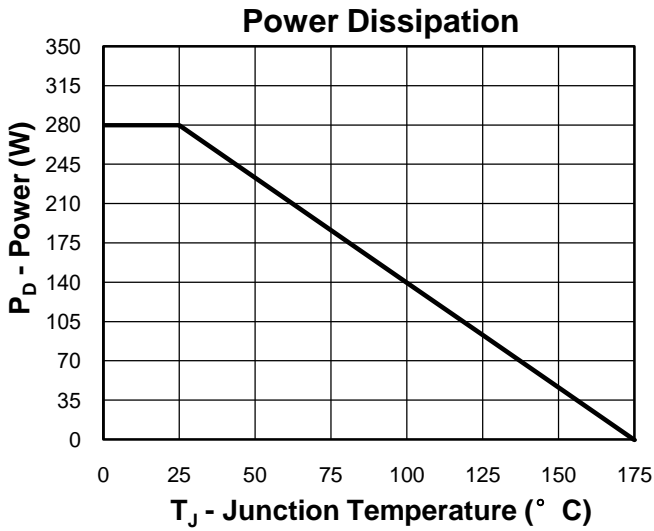
Capacitance

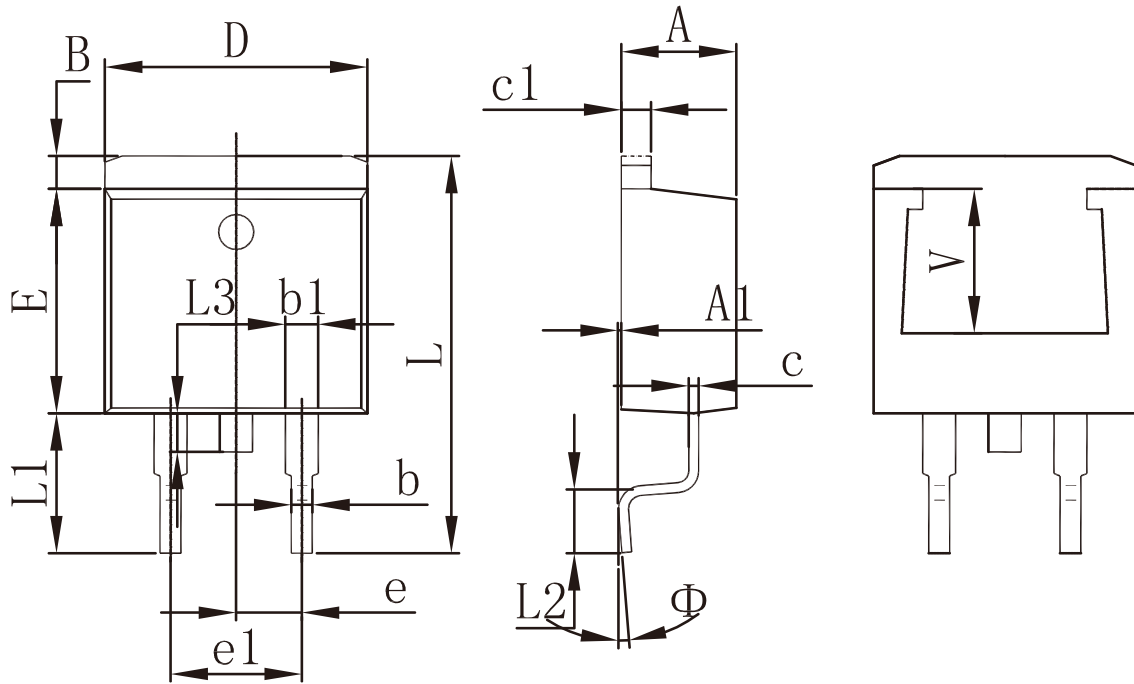


Gate Charge



Typical Characteristics (Cont.)



Packaging information


SYMBOL	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.950	5.450	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
Φ	0°	8°	0°	8°
V	5.600 REF.		0.220 REF.	

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