

General Description

N-channel enhancement mode field-effect power transistor in a plastic envelope suitable for surface mounting. The device is intended for use in Switched Mode Power Supplies (SMPS), motor control, welding, DC/DC and AC/DC converters, and in general purpose switching applications.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Mounting Information Provided for the DPAK Package
- 100% avalanche tested
- Green Device Available

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current ¹	12	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current ¹	7	A
I_{DM}	Pulsed Drain Current ²	40	A
EAS	Single Pulse Avalanche Energy ³	60.5	mJ
I_{AS}	Avalanche Current	10	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation	50	W
T_{STG}	Storage Temperature Range	-55 to 175	°C
T_J	Operating Junction Temperature Range	-55 to 175	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	100	°C/W
$R_{\theta JC}$	Thermal Resistance Junction -Case ¹	---	3	°C/W

Product Summary

BVDSS	RDSON	ID
100V	0.12Ω	12A

Applications

- PWM Motor Controls
- LED controller
- Power Supplies
- DC-DC & DC-AC Converters

TO-252/251 Pin Configuration



Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$\text{V}_{\text{GS}}=0\text{V}$, $\text{I}_D=250\text{uA}$	100	---	---	V
$\text{R}_{\text{DS(ON)}}$	Static Drain-Source On-Resistance ²	$\text{V}_{\text{GS}}=10\text{V}$, $\text{I}_D=8\text{A}$	---	---	0.12	Ω
		$\text{V}_{\text{GS}}=4.5\text{V}$, $\text{I}_D=5\text{A}$	---	---	0.135	
$\text{V}_{\text{GS(th)}}$	Gate Threshold Voltage	$\text{V}_{\text{GS}}=\text{V}_{\text{DS}}$, $\text{I}_D=250\text{uA}$	1	---	3	V
I_{DSS}	Drain-Source Leakage Current	$\text{V}_{\text{DS}}=100\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $T_J=25^\circ\text{C}$	---	---	1	uA
		$\text{V}_{\text{DS}}=100\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $T_J=150^\circ\text{C}$	---	---	10	
I_{GSS}	Gate-Source Leakage Current	$\text{V}_{\text{GS}}=\pm 20\text{V}$, $\text{V}_{\text{DS}}=0\text{V}$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$\text{V}_{\text{DS}}=10\text{V}$, $\text{I}_D=6\text{A}$	---	9	---	S
R_g	Gate Resistance	$\text{V}_{\text{DS}}=0\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $f=1\text{MHz}$	---	1.1	---	Ω
Q_g	Total Gate Charge	$\text{V}_{\text{DS}}=80\text{V}$, $\text{V}_{\text{GS}}=5\text{V}$, $\text{I}_D=6\text{A}$	---	13.5	---	nC
Q_{gs}	Gate-Source Charge		---	3.2	---	
Q_{gd}	Gate-Drain Charge		---	7.4	---	
$\text{T}_{\text{d(on)}}$	Turn-On Delay Time	$\text{V}_{\text{DD}}=50\text{V}$, $\text{V}_{\text{GS}}=10\text{V}$, $\text{R}_C=9.1\Omega$	---	9.6	---	ns
T_r	Rise Time		---	45	---	
$\text{T}_{\text{d(off)}}$	Turn-Off Delay Time		---	40	---	
T_f	Fall Time		---	21	---	
C_{iss}	Input Capacitance	$\text{V}_{\text{DS}}=25\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $f=1\text{MHz}$	---	800	---	pF
C_{oss}	Output Capacitance		---	150	---	
C_{rss}	Reverse Transfer Capacitance		---	38	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_s	Continuous Source Current ¹	$\text{V}_G=\text{V}_D=0\text{V}$, Force Current	---	---	12	A
I_{SM}	Pulsed Source Current ²		---	---	40	A
V_{SD}	Diode Forward Voltage ²	$\text{V}_{\text{GS}}=0\text{V}$, $\text{I}_s=1\text{A}$, $T_J=25^\circ\text{C}$	---	---	1	V

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 $\leq 300\text{us}$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $\text{V}_{\text{DD}}=50\text{V}$, $\text{V}_{\text{GS}}=10\text{V}$, $\text{L}=1\text{mH}$, $\text{I}_L=11\text{A}$

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