

### 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
- Mounting Information Provided for the DPAK Package
- 100% avalanche tested
- RoHS Compliant

### Product Summary

BVDSS	RDSON	ID
100V	0.32Ω	12A

### Applications

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

### TO-252/251 Pin Configuration



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	100	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D @ T_c = 25^\circ C$	Continuous Drain Current <sup>1</sup>	12	A
$I_D @ T_c = 100^\circ C$	Continuous Drain Current <sup>1</sup>	7	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	24	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	19	mJ
$P_D @ T_c = 25^\circ C$	Total Power Dissipation	45	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 <sup>1</sup>	---	100	°C/W
$R_{\theta JC}$	Thermal Resistance Junction -Case <sup>1</sup>	---	3	°C/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$\text{BV}_{\text{DSS}}$	Drain-Source Breakdown Voltage	$\text{V}_{\text{GS}}=0\text{V}$ , $\text{I}_{\text{D}}=250\text{uA}$	100	---	---	V
$\text{R}_{\text{DS(ON)}}$	Static Drain-Source On-Resistance <sup>2</sup>	$\text{V}_{\text{GS}}=10\text{V}$ , $\text{I}_{\text{D}}=5\text{A}$	---	---	0.32	$\Omega$
$\text{V}_{\text{GS(th)}}$	Gate Threshold Voltage	$\text{V}_{\text{GS}}=\text{V}_{\text{DS}}$ , $\text{I}_{\text{D}}=250\text{uA}$	3	---	5	V
$\text{I}_{\text{DSS}}$	Drain-Source Leakage Current	$\text{V}_{\text{DS}}=100\text{V}$ , $\text{V}_{\text{GS}}=0\text{V}$ , $\text{T}_J=25^\circ\text{C}$	---	---	1	uA
		$\text{V}_{\text{DS}}=100\text{V}$ , $\text{V}_{\text{GS}}=0\text{V}$ , $\text{T}_J=150^\circ\text{C}$	---	---	10	
$\text{I}_{\text{GSS}}$	Gate-Source Leakage Current	$\text{V}_{\text{GS}}=\pm 20\text{V}$ , $\text{V}_{\text{DS}}=0\text{V}$	---	---	$\pm 100$	nA
$\text{g}_{\text{fs}}$	Forward Transconductance	$\text{V}_{\text{DS}}=5\text{V}$ , $\text{I}_{\text{D}}=2\text{A}$	---	4	---	S
$\text{R}_{\text{g}}$	Gate Resistance	$\text{V}_{\text{DS}}=0\text{V}$ , $\text{V}_{\text{GS}}=0\text{V}$ , $\text{f}=1\text{MHz}$	---	2	---	$\Omega$
$\text{Q}_{\text{g}}$	Total Gate Charge	$\text{V}_{\text{DS}}=50\text{V}$ , $\text{V}_{\text{GS}}=10\text{V}$ , $\text{I}_{\text{D}}=2.5\text{A}$	---	3.5	---	nC
$\text{Q}_{\text{gs}}$	Gate-Source Charge		---	1.3	---	
$\text{Q}_{\text{gd}}$	Gate-Drain Charge		---	1	---	
$\text{T}_{\text{d(on)}}$	Turn-On Delay Time	$\text{V}_{\text{DD}}=50\text{V}$ , $\text{V}_{\text{GS}}=10\text{V}$ , $\text{R}_{\text{GEN}}=3\Omega$	---	9.6	---	ns
$\text{T}_{\text{r}}$	Rise Time		---	45	---	
$\text{T}_{\text{d(off)}}$	Turn-Off Delay Time		---	40	---	
$\text{T}_{\text{f}}$	Fall Time		---	21	---	
$\text{C}_{\text{iss}}$	Input Capacitance	$\text{V}_{\text{DS}}=50\text{V}$ , $\text{V}_{\text{GS}}=0\text{V}$ , $\text{f}=1\text{MHz}$	---	170	---	pF
$\text{C}_{\text{oss}}$	Output Capacitance		---	30	---	
$\text{C}_{\text{rss}}$	Reverse Transfer Capacitance		---	10	---	

## Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$\text{I}_{\text{s}}$	Continuous Source Current <sup>1</sup>	$\text{V}_{\text{G}}=\text{V}_{\text{D}}=0\text{V}$ , Force Current	---	---	12	A
$\text{I}_{\text{SM}}$			---	---	24	A
$\text{V}_{\text{SD}}$	Diode Forward Voltage <sup>2</sup>	$\text{V}_{\text{GS}}=0\text{V}$ , $\text{I}_{\text{s}}=5\text{A}$ , $\text{T}_J=25^\circ\text{C}$	---	---	1	V

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> 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  $\text{V}_{\text{DD}}=30\text{V}$ , $\text{V}_{\text{GS}}=10\text{V}$ , $\text{L}=2\text{mH}$  ,  $\text{I}_{\text{D}}=4.4\text{A}$

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