

General Description

- Trench Power MOSFET Technology
- Low $R_{DS(ON)}$
- Optimized for High Reliable Switch Application
- High Current Capability
- RoHS and Halogen-Free Compliant

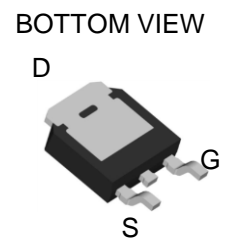
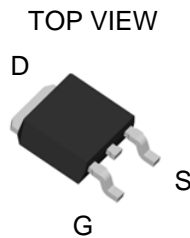
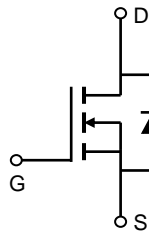
Applications

- Motor Drive
- Load Switch
- Battery Protection
- General DC/DC Converters

Product Summary

V_{DS}	30V
I_D (at $V_{GS}=10V$)	146A
$R_{DS(ON)}$ (at $V_{GS}=10V$, typ)	2.4m Ω
$R_{DS(ON)}$ (at $V_{GS}=4.5V$, typ)	2.8m Ω

100% UIS Tested
100% R_G Tested



Orderable Part Number

VIS30024

Package Type

TO-252

Form

Tape & Reel

Minimum Order Quantity

3000

Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ⁽⁵⁾	I_D	$T_C=25^\circ\text{C}$	146
		$T_C=100^\circ\text{C}$	93
Pulsed Drain Current ⁽³⁾	I_{DM}	280	A
Continuous Drain Current	I_{DSM}	$T_A=25^\circ\text{C}$	38
		$T_A=70^\circ\text{C}$	30
Avalanche Current ⁽³⁾	I_{AS}	65	A
Avalanche energy $L=0.1\text{mH}$ ⁽³⁾	E_{AS}	211	mJ
Power Dissipation ⁽²⁾	P_D	$T_C=25^\circ\text{C}$	96
		$T_C=100^\circ\text{C}$	38
Power Dissipation ⁽¹⁾	P_{DSM}	$T_A=25^\circ\text{C}$	6.2
		$T_A=70^\circ\text{C}$	4
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ⁽¹⁾	$R_{\theta JA}$	15	20	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Ambient ^(1,4)		Steady-State	40	50
Maximum Junction-to-Case	$R_{\theta JC}$	1.3	1.6	$^\circ\text{C}/\text{W}$



VIS30024

30V N-Channel Power Trench MOSFET

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D=250\text{mA}, V_{GS}=0\text{V}$	30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30\text{V}, V_{GS}=0\text{V}$ $T_J=55^\circ\text{C}$			1 5	μA
I_{GSS}	Gate-Body leakage current	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\text{mA}$	1.4	1.8	2.2	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}, I_D=20\text{A}$ $T_J=125^\circ\text{C}$		2.4	2.9	m Ω
		$V_{GS}=4.5\text{V}, I_D=20\text{A}$		2.8	3.4	
g_{FS}	Forward Transconductance	$V_{DS}=5\text{V}, I_D=20\text{A}$		120		S
V_{SD}	Diode Forward Voltage	$I_S=1\text{A}, V_{GS}=0\text{V}$		0.69		V
I_S	Maximum Body-Diode Continuous Current				140	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	$V_{GS}=0\text{V}, V_{DS}=15\text{V}, f=1\text{MHz}$		6335		pF
C_{oss}	Output Capacitance			756		pF
C_{rss}	Reverse Transfer Capacitance			367		pF
R_g	Gate resistance	$f=1\text{MHz}$		0.8		Ω
SWITCHING PARAMETERS						
$Q_g(10\text{V})$	Total Gate Charge	$V_{GS}=10\text{V}, V_{DS}=15\text{V}, I_D=20\text{A}$		104		nC
$Q_g(4.5\text{V})$	Total Gate Charge			51		nC
Q_{gs}	Gate Source Charge			15		nC
Q_{gd}	Gate Drain Charge			18		nC
$t_{D(on)}$	Turn-On Delay Time	$V_{GS}=10\text{V}, V_{DS}=15\text{V},$ $R_L=0.75\text{W}, R_{GEN}=3\text{W}$		8.6		ns
t_r	Turn-On Rise Time			9.6		ns
$t_{D(off)}$	Turn-Off Delay Time			58.4		ns
t_f	Turn-Off Fall Time			22.8		ns
t_{rr}	Body Diode Reverse Recovery Time	$I_F=20\text{A}, di/dt=500\text{A/ms}$		29.3		ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F=20\text{A}, di/dt=500\text{A/ms}$		20.5		nC

- 1) $R_{\theta JA}$ is measured with the device mounted on a 1in^2 FR-4 board with 2oz. copper, in a still air environment with $T_A=25^\circ\text{C}$. The Power dissipation P_{DSM} is based on $R_{\theta JA} \leq 10\text{s}$ and the maximum allowed junction temperature of 150°C . The value in any given application depends on the user's specific board design.
- 2) The power dissipation P_D is based on $T_{J(MAX)}=150^\circ\text{C}$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
- 3) Single pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$.
- 4) $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.
- 5) The maximum current rating is package limited.

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