



N-Channel MOSFET, 100V, 12A, 112mΩ

General Description

The VAS10R1120DF utilizes the advanced Trench technology and low resistance package to achieve extremely low on-resistance device which makes the system design an efficient and reliable solution for use in a wide variety of applications.

Features

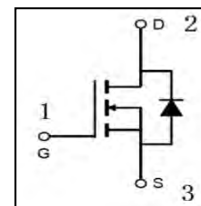
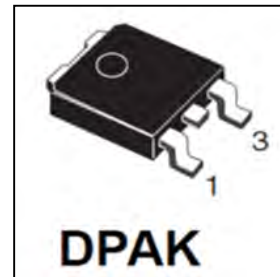
- 100V, 12A, $R_{DS(on)}=112m\Omega@V_{GS}=10V$
- High Efficiency
- Improved dv/dt, di/dt capability
- 100% EAS Guaranteed
- Green Device

Application

Mother Board, VGA, SMPS

Product Summary

$V_{DS}@T_{j,max}$	100 V
$R_{DS(on)}@V_{GS}=10V$	112mΩ
I_D Continuous Current	12A



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit	Condition
Drain-Source Voltage	V_{DS}	100	V	
Continuous drain current ⁽¹⁾	I_D	12 7.7	A	$T_C=25^\circ C$ $T_C=70^\circ C$
Gate-Source Voltage	V_{GS}	± 20	V	Static
Pulsed drain current ⁽²⁾	I_{DM}	24	A	$T_C=25^\circ C$
Power dissipation @ $T_C=25^\circ C$	P_{diss}	34.7	W	$T_C=25^\circ C$
Continuous diode forward current	I_S	12	A	$T_C=25^\circ C$
Diode pulse current ⁽²⁾	$I_{S,pulse}$	24	A	$T_C=25^\circ C$
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ C$	
Operation Junction Temperature Range	T_J	-55 to 150	$^\circ C$	

(1) Limited by $T_{j,max}$.

(2) Pulse width T_P limited by $T_{j,max}$



Thermal characteristics

Symbol	Parameter	Min	Typ	Max	Unit
R_{thJA}	Thermal resistance, junction-ambient, max	---	---	62	°C/W
T_{sold}	Soldering temperature, max	---	---	260	°C

Package and Ordering Information

Device	Package	Tape and Reel
VAS10R1120DF	TO252	2,500 ea



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

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Static Characteristic						
Drain-Source breakdown Voltage	$V_{(BR)DSS}$	100	---	---	V	$V_{GS}=0V, I_D=0.25mA$
Gate Threshold Voltage	$V_{(GS)th}$	1.0	---	2.5	V	$V_{DS}=V_{GS}, I_D=0.25mA$
Drain-Source on resistance	$R_{(DS)on}$	---	---	112	m Ω	$V_{GS}=10V, I_D=10A, T_j=25^\circ\text{C}$
		---	---	120	m Ω	$V_{GS}=4.5V, I_D=8A, T_j=25^\circ\text{C}$
Zero gate voltage drain current	I_{DSS}	---	---	1	μA	$V_{DS}=80V, V_{GS}=0V, T_j=25^\circ\text{C}$
Gate-Source leakage current	I_{GSS}	---	---	100	nA	$V_{GS}=\pm 20V, V_{DS}=0V$
Dynamic Characteristic						
Input Capacitance	C_{iss}	---	1535	---	pF	$V_{GS}=0V, V_{DS}=15V, f=1MHz$
Output Capacitance	C_{oss}	---	60	---	pF	$V_{GS}=0V, V_{DS}=15V, f=1MHz$
Reverse Transfer Capacitance	C_{rss}	---	37	---	pF	$V_{GS}=0V, V_{DS}=15V, f=1MHz$
Turn-on delay time	$T_{d(on)}$	---	4.2	---	nS	$V_{DD}=50V, V_{GS}=10V, I_D=10A,$ $R_G=3.3\Omega$; See Figure 8
Rise time	T_r	---	8.2	---	nS	
Turn-off delay time	$T_{d(off)}$	---	35.6	---	nS	
Fall time	T_f	---	9.6	---	nS	
Gate Charge Characteristic						
Gate to source charge	Q_{gs}	---	4.6	---	nC	$V_{DD}=80V, I_D=10A, V_{GS}=10V$
Gate to drain charge	Q_{gd}	---	5.1	---	nC	
Gate charge total	Q_g	---	26.2	---	nC	
Reverse diode characteristic						
Diode forward voltage	V_{FD}	---	---	1.2	V	$V_{GS}=0V, I_F=-1A, T_j=25^\circ\text{C}$
Continuous Source Current	I_{csc}	---	---	12	A	$V_G=V_D=0V$, Force current
Pulsed Source Current	I_{sm}	---	---	24	A	
Reverse Recovery Time	t_{rr}	---	37	---	nS	$I_F=10A, dI/dt=100A/\mu S, T_j=25^\circ\text{C}$
Reverse Recovery Charge	Q_{rr}	---	27.3	---	nC	



Electrical Characteristic Diagrams

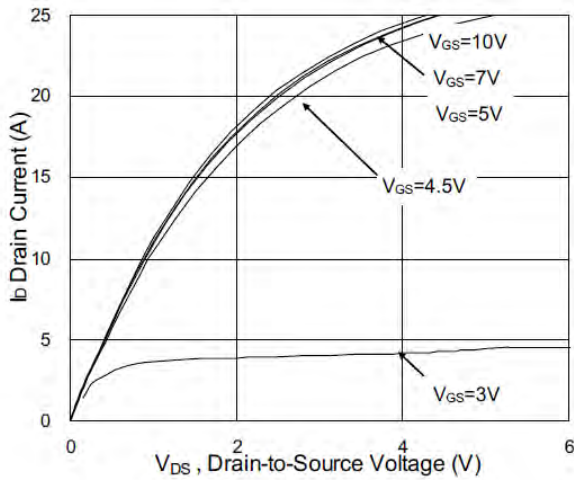


Figure 1 Typical Output Characteristic

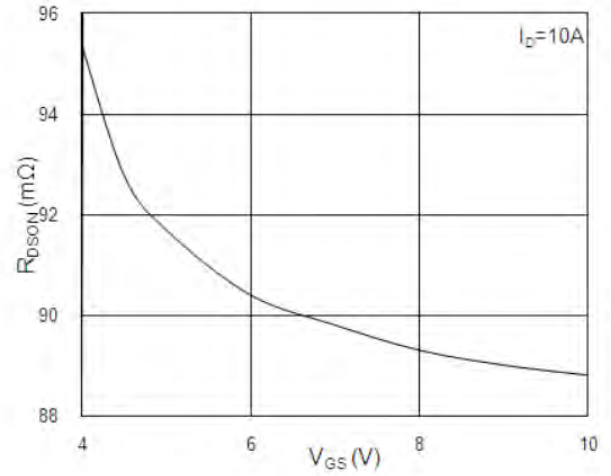


Figure 2 On-Resistance vs. GS voltage

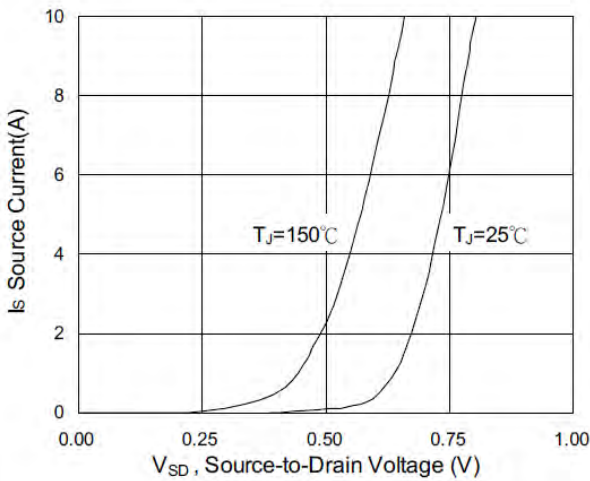


Figure 3 Forward Characteristic of Reverse

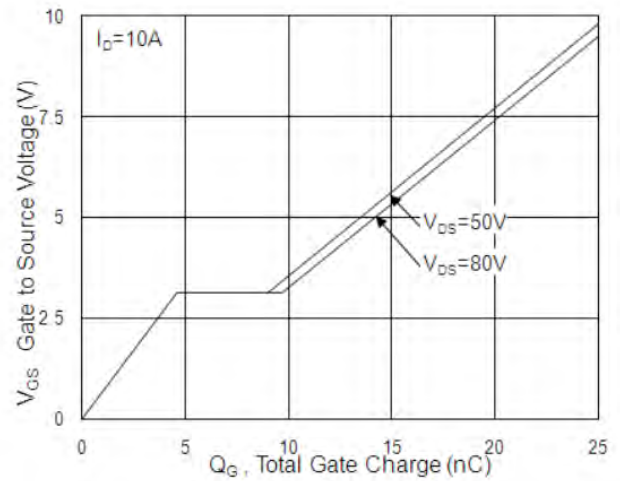


Figure 4 Gate Charge Waveform

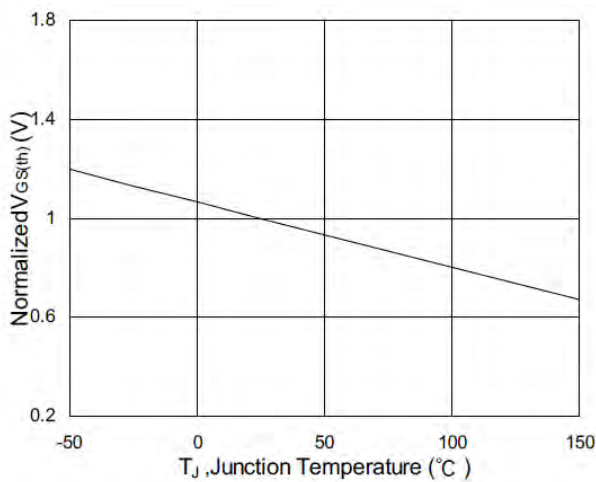


Figure 5 Normalized $V_{GS(th)}$ vs. T_J

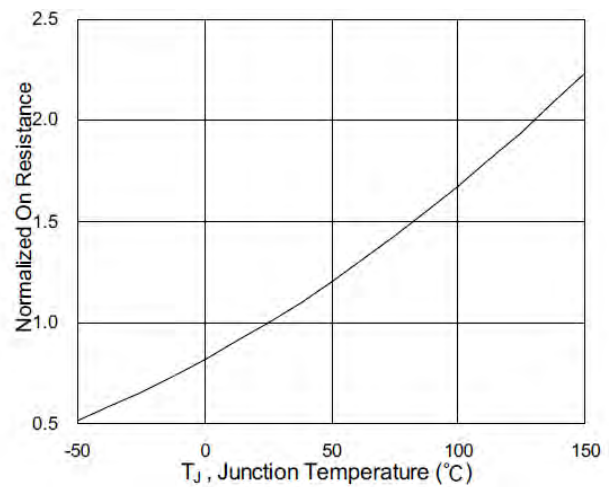


Figure 6 Normalized $R_{ds(on)}$ vs. T_J

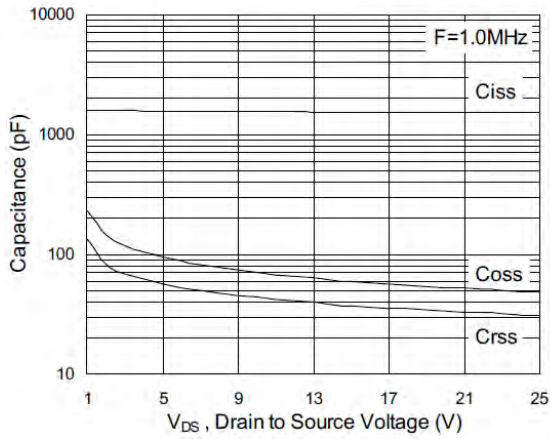


Figure 7 Capacitance Characteristic

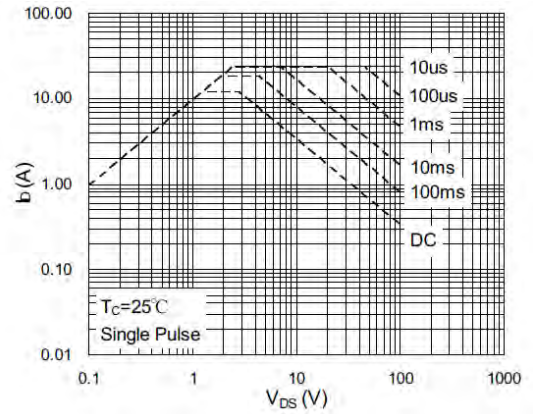


Figure 8 Safe Operating Area

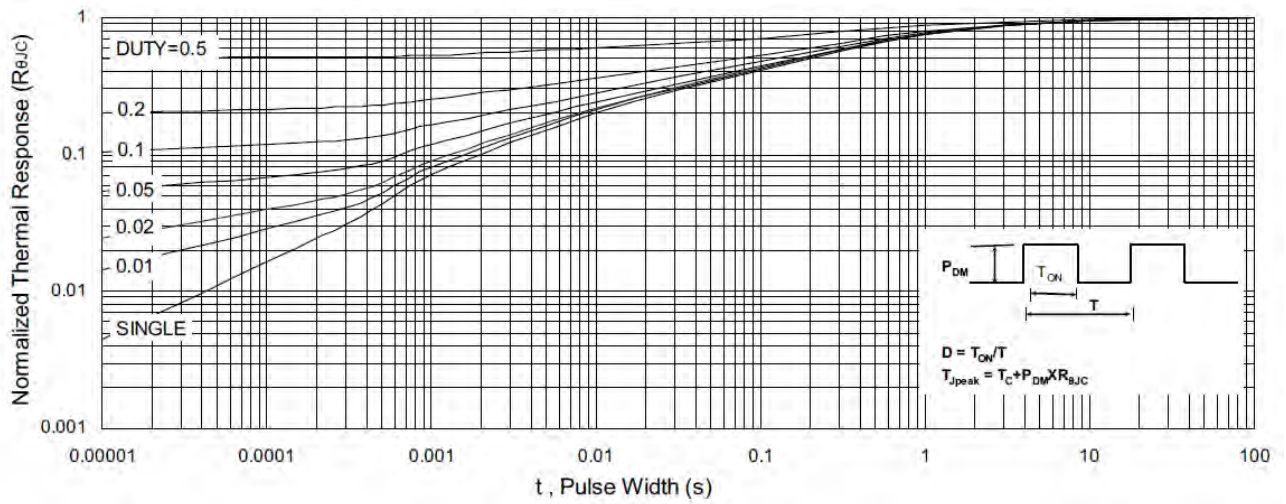


Figure 8 Normalized Maximum Transient Thermal Impedance

Parameter Test Circuits

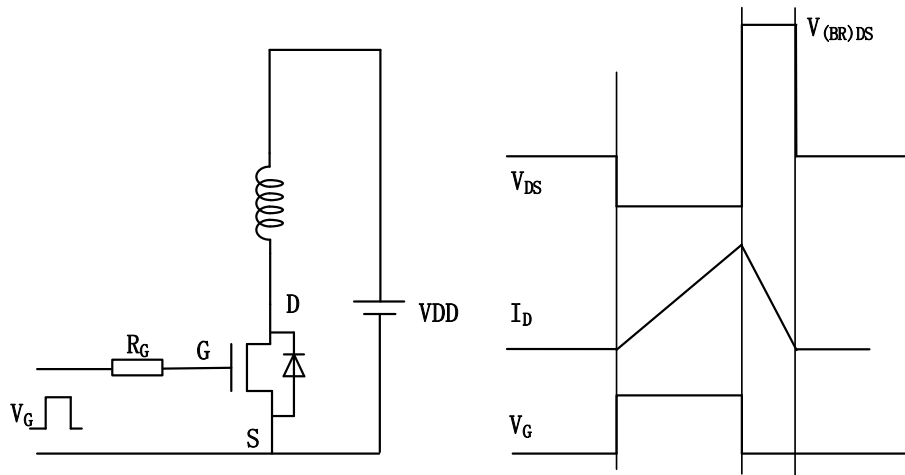


Figure 9 Unclamped Inductive Switching (UIS) Test circuit and waveforms

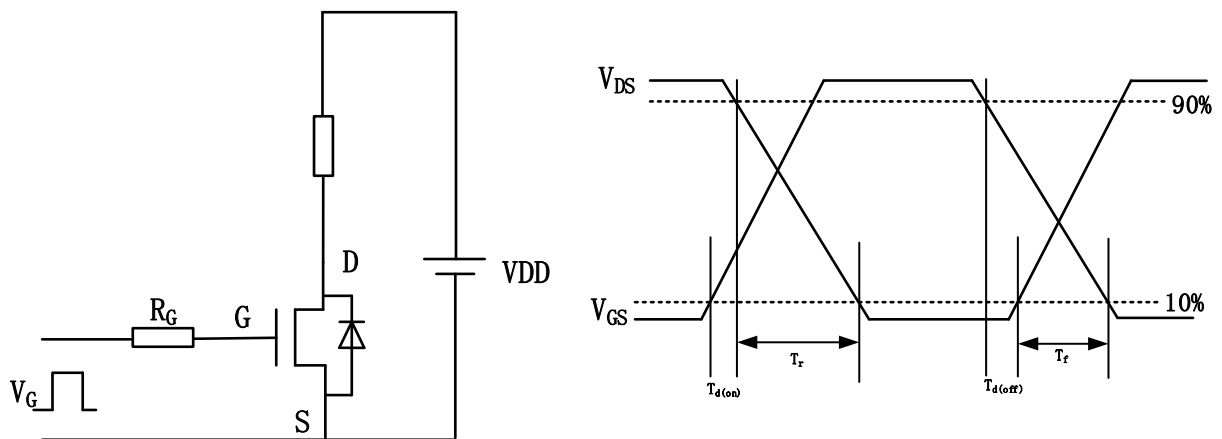


Figure 10 Resistive Switching time Test circuit and waveforms

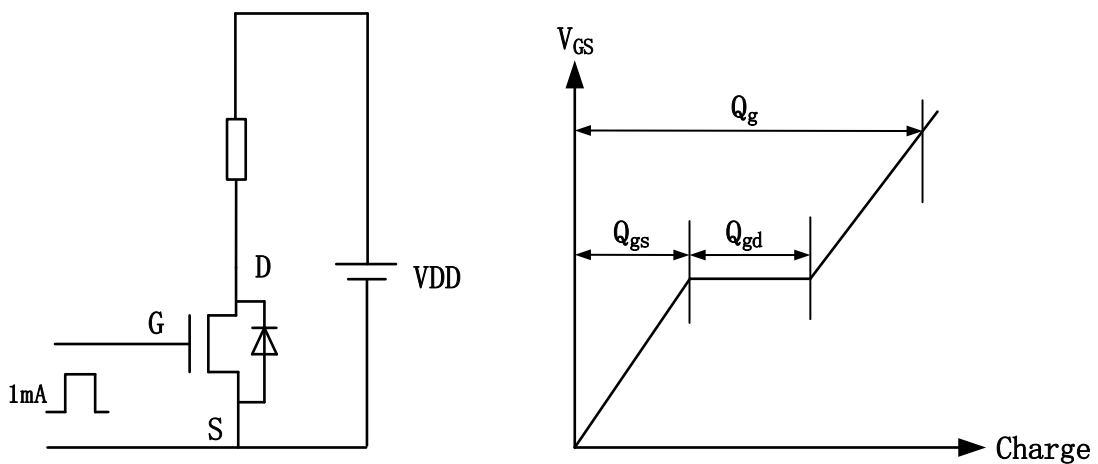
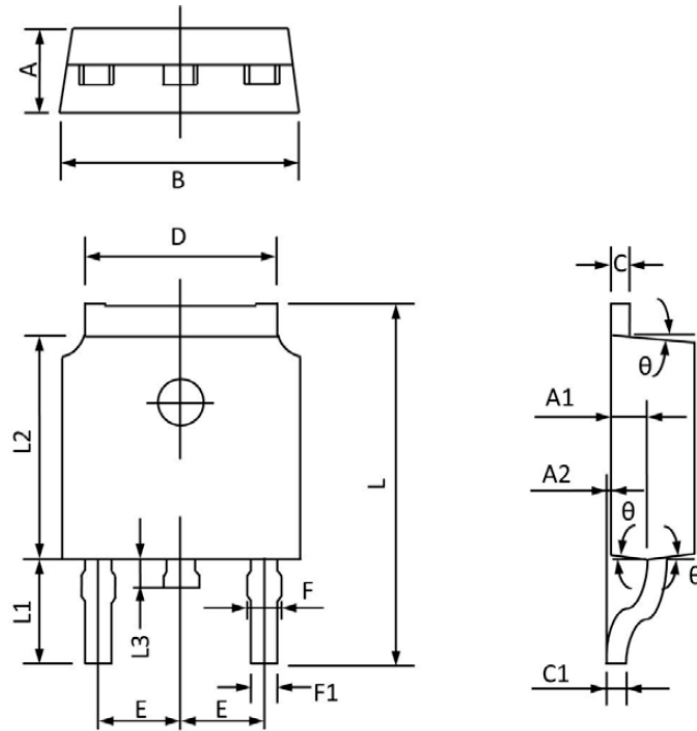


Figure 11 Gate charge Test circuit and waveforms



Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.20	2.40	0.087	0.094
A1	0.91	1.11	0.036	0.044
A2	0.00	0.15	0.000	0.006
B	6.50	6.70	0.256	0.264
C	0.46	0.580	0.018	0.230
C1	0.46	0.580	0.018	0.030
D	5.10	5.46	0.201	0.215
E	2.186	2.386	0.086	0.094
F	0.74	0.94	0.029	0.037
F1	0.660	0.860	0.026	0.034
L	9.80	10.40	0.386	0.409
L1	2.9REF		0.114REF	
L2	6.00	6.20	0.236	0.244
L3	0.60	1.00	0.024	0.039
θ	3°	9°	3°	9°

单击下面可查看定价，库存，交付和生命周期等信息

[>>Chiplead\(奇力科技\)](#)