JMV5772ND

Product Preview

40V N-Channel MOSFET

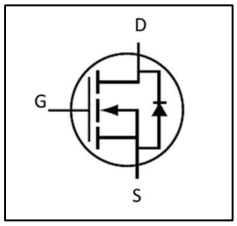
Features

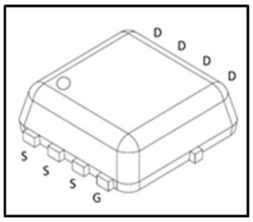
- Advanced shielded-gate technology
- Ultra-low on-resistance and gate-charge
- RoHS compliant
- 100% avalanche tested

Product Summary	
V_{DS}	40V
$R_{DS(ON)}$	2.8 mΩ (Typ.)
	3.4 mΩ (Max.)

Applications

- Motor controllers
- DC-to-DC convertors
- Battery-driven electronic products, electrical equipment and machines





Ordering Information

Part Number	Marking	Package	Packaging
JMV5772ND	V5772ND	DFN3.3x3.3	Tape & Reel

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Drain-to-Source Voltage	V_{DS}	40	V
Gate-to-Source Voltage	V_{GS}	±20	
Continuous Drain Current, Silicon Limited (T_C = 25°C) (1)	I_D	99	A
Continuous Drain Current, Silicon Limited (T_C = 100°C) (1)	I_D	63	
Continuous Drain Current, Silicon Limited t (T_A = 25°C) (2), (3)	I_D	22	
Continuous Drain Current, Silicon Limited (T_A = 100°C) (2), (3)	I_D	14	
Pulsed Drain Current (4)	I_{DM}	200	
Power Dissipation (T_C = 25°C)	P_D	56.8	W
Linear Derating Factor	-	0.45	W/°C
Single Pulse Avalanche Energy (5)	E_{AS}	90 (6)	mJ
Avalanche Current (7)	I_{AS}	28	A
Junction Temperature	T_J	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	

Thermal Characteristics

Parameter	Symbol	Max	Unit
Junction-to-Ambient Thermal Resistance (3)	$R_{\theta JA}$	45	°C/W
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	2.2	

Static Electrical Characteristics (8)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250μA	40	-	-	V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS} = V_{GS} , I_D = 250μA	1.1	-	2.2	
Drain-to-Source Leakage Current	I_{DSS}	V_{DS} = 40V, V_{GS} = 0V	-	-	1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 20A	-	2.8	3.4	mΩ
		V_{GS} = 4.5V, I_D = 20A	-	3.8	4.9	mΩ

Dynamic Electrical Characteristics (8)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Forward Transconductance	g_{fs}	V_{DS} = 5V, I_D = 20A	-	72	-	S
Total Gate Charge	Q_g	V_{GS} = 10V,	-	22.9	-	nC
Gate-to-Source Charge	Q_{gs}	V_{DS} = 20V,	-	3.1	-	
Gate-to-Drain Charge	Q_{gd}	I_D = 20A	-	3.8	-	
Turn-On Delay Time	$t_{d(on)}$	V_{GS} = 10V,	-	TBC	-	ns
Rise Time	t_r	V_{DS} = 20V,	-	TBC	-	
Turn-Off Delay Time	$t_{d(off)}$	I_D = 20A,	-	TBC	-	
Fall Time	t_f	R_G = 3.0Ω	-	TBC	-	
Input Capacitance	C_{iss}	V_{GS} = 0V,	-	1802	-	pF
Output Capacitance	C_{oss}	f = 1MHz,	-	716	-	
Reverse Transfer Capacitance	C_{rss}	V_{DS} = 20V	-	84	-	

Diode Characteristics (8)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Forward Voltage	V_{SD}	V_{GS} = 0V, I_S = 20A	-	0.8	-	V
Reverse Recovery Time	t_{rr}	V_{GS} = 0V, I_S = 20A,	-	47	-	ns
Reverse Recovery Charge	Q_{rr}	dI_S/dt = 100A/μs	-	36	-	nC

(1) Rated according to $R_{\theta JC}$

(2) Rated according to $R_{\theta JA}$

(3) Surface−mounted on 1 inch² FR4 board, 2 oz Cu

(4) Limited by maximum T_J

(5) Starting T_J = 25°C, L = 0.1mH, V_{DD} = 30V, V_{GS} = 10V

(6) TBC: To be confirmed

(7) Pulse width limited by maximum T_J

(8) T_J = 25°C unless otherwise specified

Typical Electrical Characteristics

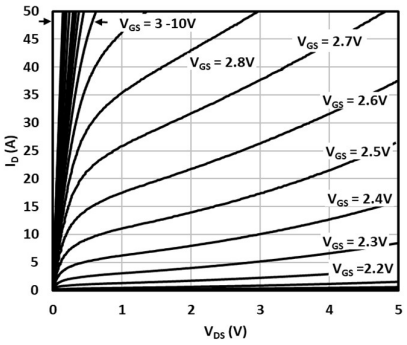


Fig. 1 Output characteristics

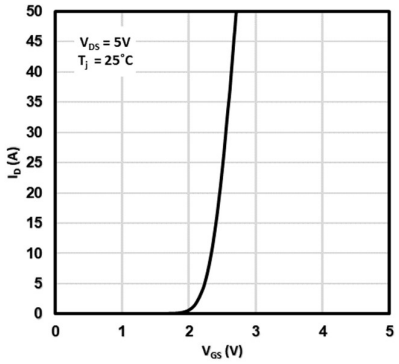


Fig. 2 Transfer characteristics

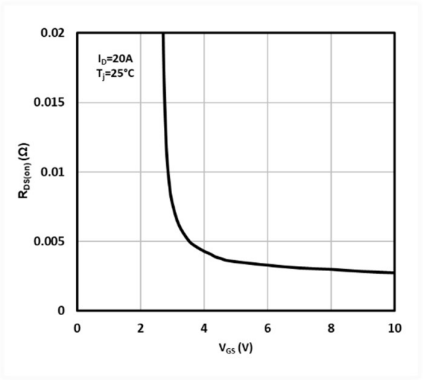


Fig.3 On-resistance vs. gate voltage

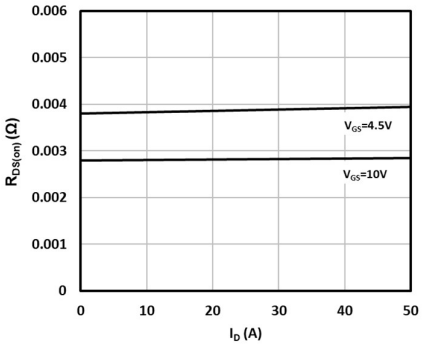


Fig.4 On-resistance vs. drain current

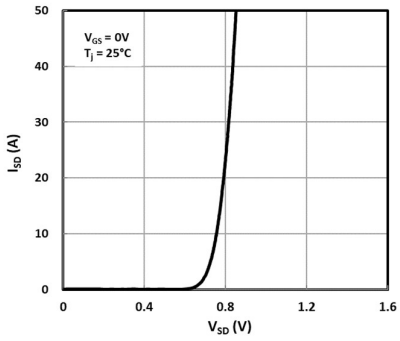


Fig.5 Source-to-drain diode forward characteristics

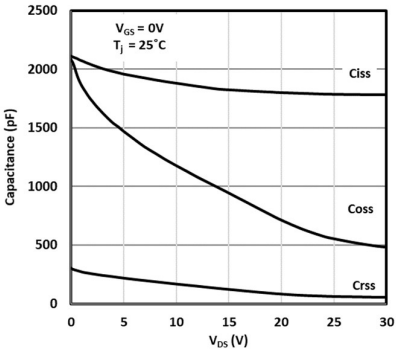
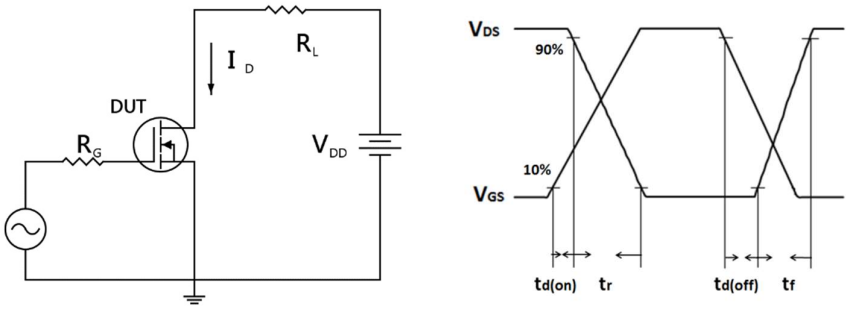
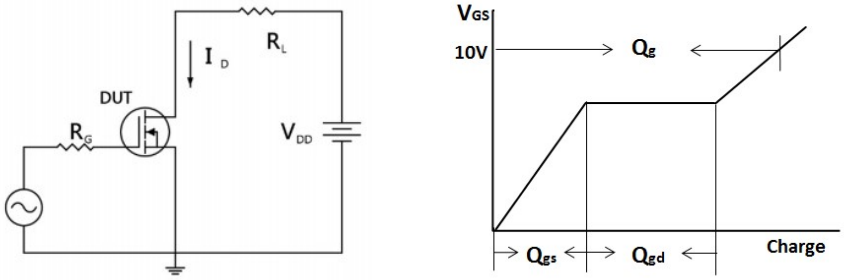


Fig.6 Capacitance vs. drain-to-source voltage

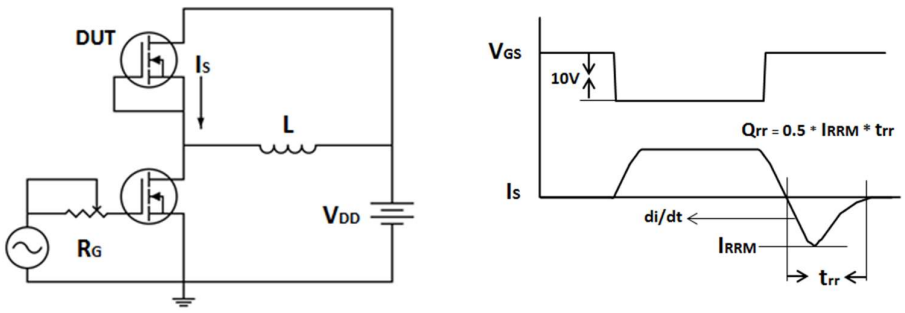
Test Circuits and Waveforms



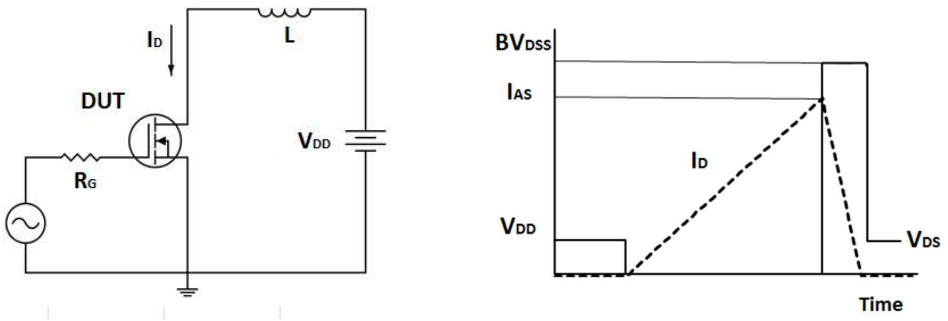
Resistive switching time test circuit & waveforms



Gate charge test circuit & waveform

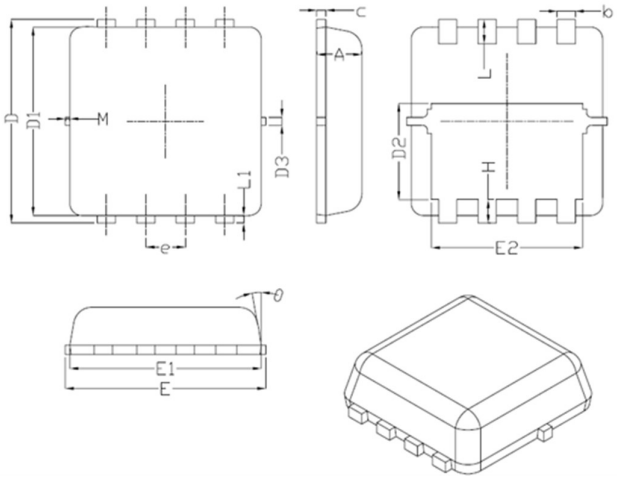


Peak diode recovery dv/dt test circuit & waveforms



Unclamped inductive switching test circuit & waveforms

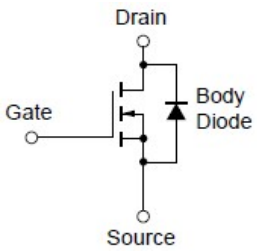
Package Drawing



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.70	0.80	0.90
b	0.25	0.32	0.39
c	0.10	0.15	0.25
D	3.00	3.30	3.60
D1	3.00	3.10	3.50
D2	1.48	2.00	2.20
D3	--	0.20	--
E	3.00	3.30	3.60
E1	3.00	3.10	3.25
E2	2.29	2.49	2.69
e	0.65 BSC		
H	0.15	0.25	0.50
L	0.15	0.40	0.60
L1	0.05	0.15	0.25
α	8°	10°	12°
M	--	0.10	--

DFN 3.3x3.3

Equivalent Circuit



Revision history of JMV5772ND specification

Version	Change Items	Effective Date
1.00	Initial Release	11-Jun-21

Notice

General – Information in this document is believed to be accurate and reliable. However, JSAB Technologies does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

Right to make changes – JSAB Technologies reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use – JSAB Technologies' products are not designed, authorized or warranted to be suitable for use in medical, military, aircraft, space or life support equipment, nor in applications where failure or malfunction of an JSAB Technologies product can reasonably be expected to result in personal injury, death or severe property or environmental damage. JSAB Technologies accepts no liability for inclusion and/or use of JSAB Technologies' products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications – Applications that are described herein for any of these products are for illustrative purposes only. JSAB Technologies makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Limiting values – Stress above one or more limiting values may cause permanent damage to the device. Limiting values are stress ratings only and operation of the device at these or any other conditions above those given in the Characteristics sections of this document is not implied. Exposure to limiting values for extended periods may affect device reliability.

Terms and conditions of sale – JSAB Technologies' products are sold subject to the general terms and conditions of commercial sale, including those pertaining to warranty, intellectual property rights infringement and limitation of liability, unless explicitly otherwise agreed to in writing by JSAB Technologies. In case of any inconsistency or conflict between information in this document and such terms and conditions, the latter will prevail.

No offer to sell or license – Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

Export control – This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from national authorities.

Quick reference data – The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding.