



# AMDV030N150URH

Single N-channel Trench MOSFET 30V 15mΩ 29A

## FEATURES

- Trench power MOSFET technology
- N-channel, logic level
- 100% Avalanche tested
- Maximum 175°C junction temperature
- AEC-Q101 qualified

## APPLICATIONS

- DC-DC Converter
- Load Switch Applications

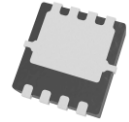
## KEY PERFORMANCE PARAMETERS

$V_{DS}$	30	V
$R_{DS(on), typ}$	0.011	$\Omega$
$I_D$	29	A
$Q_G$	8.3	nC
Junction temperature, $_{max}$	175	$^{\circ}C$

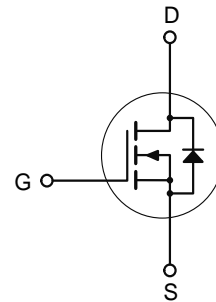


Top View

PDFN33



Bottom View



## ORDERING INFORMATION

Type / Ordering Code	Package	Marking	Packing	RoHS Status
AMDV030N150URH	PDFN33	30N150	Tape & Reel	Halogen Free

<http://www.magnachip.com/>

**ABSOLUTE MAXIMUM RATINGS**, at  $T_c = 25^\circ\text{C}$ , unless otherwise specified

PARAMETER		SYMBOL	RATING	UNIT
Drain-source Voltage		$V_{DS}$	30	V
Gate-source Voltage		$V_{GS}$	$\pm 20$	V
Drain current	$T_c=25^\circ\text{C}$	$I_D$	29	A
	$T_c=100^\circ\text{C}$		20	A
<sup>1)</sup> Pulsed drain current	$T_c=25^\circ\text{C}$	$I_{DM}$	115	A
Total power dissipation	$T_c=25^\circ\text{C}$	$P_{tot}$	20	W
	$T_c=100^\circ\text{C}$		10	W
<sup>2)</sup> Avalanche energy, single pulse		$E_{AS}$	6.5	mJ
Operating and storage temperature		$T_j, T_{stg}$	- 55 ~ 175	$^\circ\text{C}$

**THERMAL CHARACTERISTICS**

PARAMETER		SYMBOL	RATING	UNIT
Thermal resistance, junction - case		$R_{\theta JC}$	7.6	K/W
<sup>3)</sup> Thermal resistance, junction - ambient		$R_{\theta JA}$	40	K/W

ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25°C)

## STATIC CHARACTERISTICS

PARAMETER	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	30	-	-	V	V <sub>GS</sub> =0 V, I <sub>D</sub> =250 μA
Gate threshold voltage	V <sub>GS(th)</sub>	1.3	1.9	2.7	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μA
Zero gate voltage drain current	I <sub>DSS</sub>	-	-	1	μA	V <sub>DS</sub> =30 V, V <sub>GS</sub> =0 V
Gate-source leakage current	I <sub>GSS</sub>	-	-	± 100	nA	V <sub>GS</sub> =±20 V, V <sub>DS</sub> =0 V
Drain-source on-state resistance	R <sub>DS(on)</sub>	-	11.0	15.0	mΩ	V <sub>GS</sub> =10 V, I <sub>D</sub> =10 A
		-	15.9	22.5	mΩ	V <sub>GS</sub> =4.5V, I <sub>D</sub> =9 A
<sup>4)</sup> Gate resistance	R <sub>G</sub>	-	2.2	-	Ω	f=1MHz
<sup>4)</sup> Transconductance	g <sub>fs</sub>	-	13.5	-	S	V <sub>DS</sub> =5 V, I <sub>D</sub> =8 A

<sup>4)</sup> DYNAMIC CHARACTERISTICS

PARAMETER	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Input capacitance	C <sub>iss</sub>	-	483	-	pF	V <sub>DS</sub> =0 V, V <sub>GS</sub> =15 V, f=1 MHz
Output capacitance	C <sub>oss</sub>	-	99	-	pF	V <sub>GS</sub> =0 V, V <sub>DS</sub> =15 V, f=1 MHz
Reverse transfer capacitance	C <sub>rss</sub>	-	54	-	pF	V <sub>GS</sub> =0 V, V <sub>DS</sub> =15 V, f=1 MHz
Turn-on delay time	t <sub>d(on)</sub>	-	7.3	-	ns	V <sub>DD</sub> =15 V, V <sub>GS</sub> =10 V, I <sub>D</sub> =10 A, R <sub>G,ext</sub> =3Ω
Rise time	t <sub>r</sub>	-	3.9	-	ns	V <sub>DD</sub> =15 V, V <sub>GS</sub> =10 V, I <sub>D</sub> =10 A, R <sub>G,ext</sub> =3Ω
Turn-off delay time	t <sub>d(off)</sub>	-	29.4	-	ns	V <sub>DD</sub> =15 V, V <sub>GS</sub> =10 V, I <sub>D</sub> =10 A, R <sub>G,ext</sub> =3Ω
Fall time	t <sub>f</sub>	-	14.7	-	ns	V <sub>DD</sub> =15 V, V <sub>GS</sub> =10 V, I <sub>D</sub> =10 A, R <sub>G,ext</sub> =3Ω

<sup>4)</sup> GATE CHARGE CHARACTERISTICS

PARAMETER	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Gate to source charge	Q <sub>gs</sub>	-	1.4	-	nC	V <sub>DD</sub> =15 V, I <sub>D</sub> =10 A, V <sub>GS</sub> =0 to 10 V
Gate to drain charge	Q <sub>gd</sub>	-	1.8	-	nC	V <sub>DD</sub> =15 V, I <sub>D</sub> =10 A, V <sub>GS</sub> =0 to 10 V
Gate charge total	Q <sub>g(10V)</sub>	-	8.3	-	nC	V <sub>DD</sub> =15 V, I <sub>D</sub> =10 A, V <sub>GS</sub> =0 to 10 V
Gate charge total	Q <sub>g(4.5V)</sub>	-	4.1	-	nC	V <sub>DD</sub> =15 V, I <sub>D</sub> =10 A, V <sub>GS</sub> =0 to 4.5 V
Gate plateau voltage	V <sub>plateau</sub>	-	3.1	-	V	V <sub>DD</sub> =15 V, I <sub>D</sub> =10 A, V <sub>GS</sub> =0 to 10 V

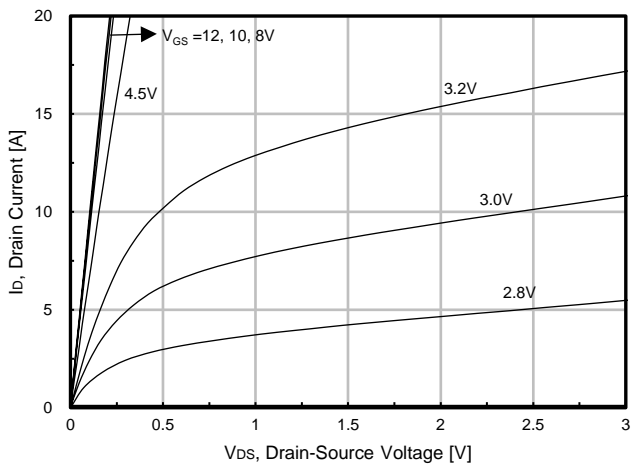
## SOURCE-DRAIN DIODE

PARAMETER	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
<sup>4)</sup> Diode continuous forward current	I <sub>S</sub>	-	-	31	A	-
<sup>4)</sup> Diode pulse current	I <sub>S,pulse</sub>	-	-	124	A	pulsed; t <sub>p</sub> ≤ 10 μs
Diode forward voltage	V <sub>SD</sub>	-	0.83	1.1	V	V <sub>GS</sub> =0 V, I <sub>F</sub> =10 A
<sup>4)</sup> Reverse recovery time	t <sub>rr</sub>	-	25.4	-	ns	I <sub>F</sub> =10 A, d <sub>I</sub> /dt=100 A/μs
<sup>4)</sup> Reverse recovery charge	Q <sub>rr</sub>	-	18.2	-	nC	I <sub>F</sub> =10 A, d <sub>I</sub> /dt=100 A/μs

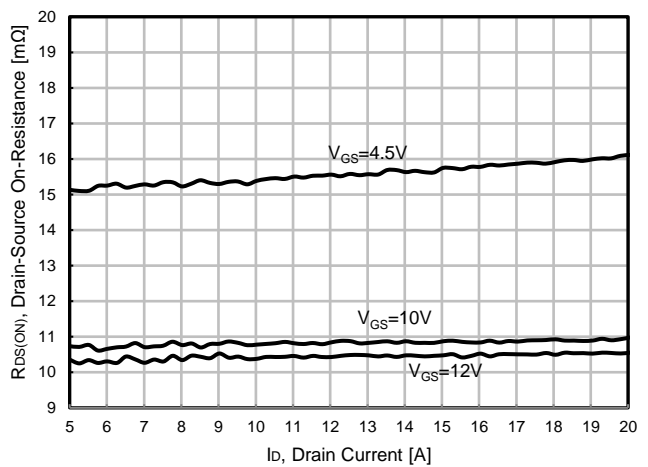
## Notes

- Pulse width limited by T<sub>Jmax</sub>
- Starting T<sub>J</sub>=25°C, L=0.1mH, I<sub>AS</sub>=11.4A, V<sub>DD</sub>=30V, V<sub>GS</sub>=10V
- Surface mounted FR-4 board by JEDEC (jesd51-7)
- The parameter is not subject to production testing - guaranteed by design.

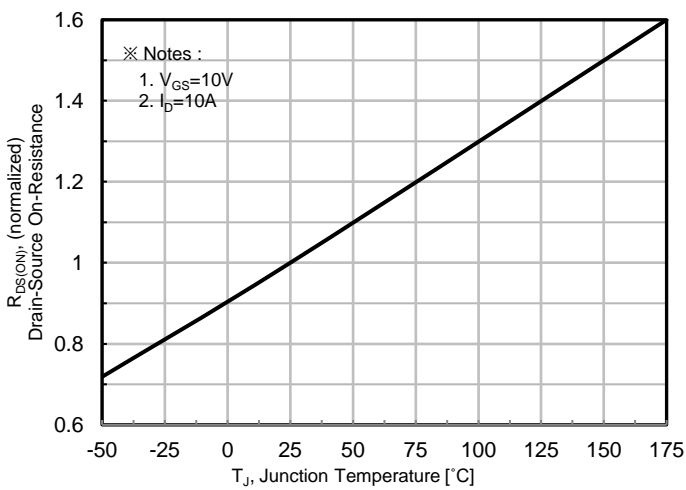
**ELECTRICAL CHARACTERISTICS DIAGRAMS (25 °C, unless otherwise noted)**



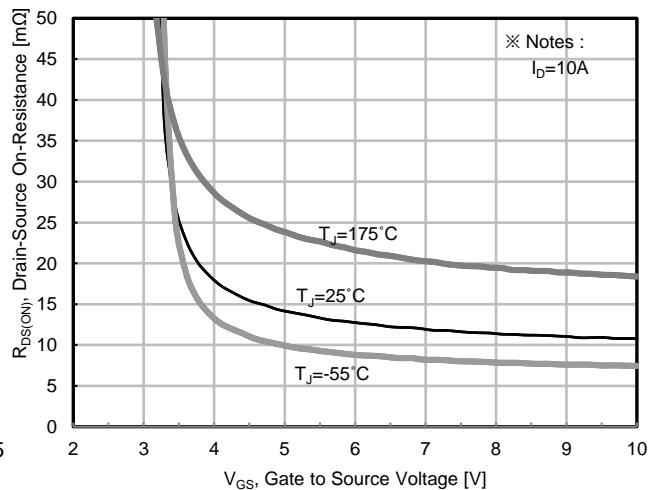
**Fig. 1. Output Characteristics (25°C)**



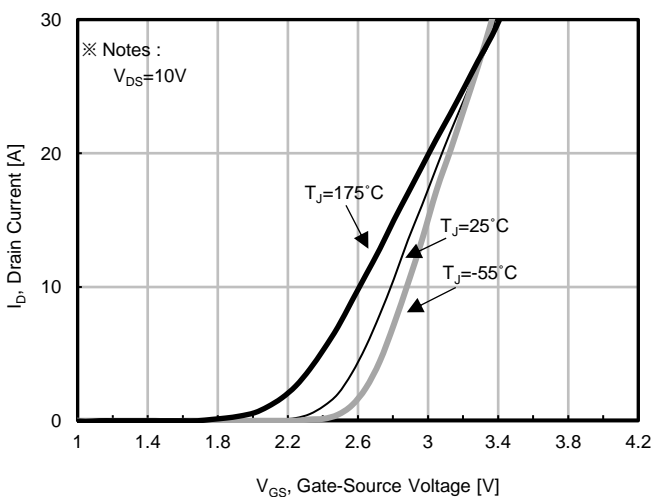
**Fig. 2. Static On-Resistance Variation**



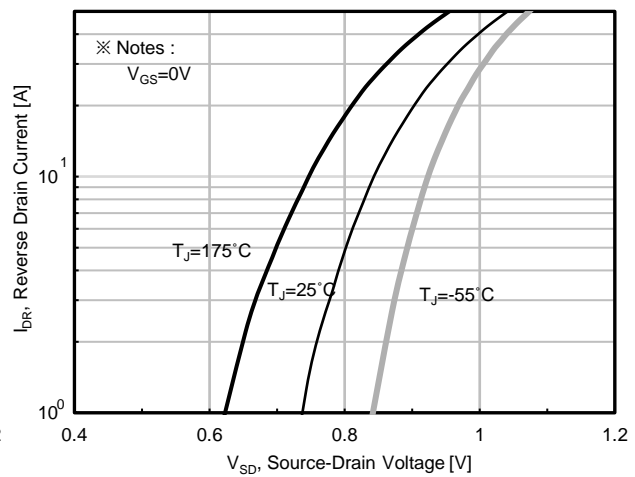
**Fig. 3. On-Resistance vs. Junction Temperature**



**Fig. 4. On-Resistance vs. Gate to source Voltage**

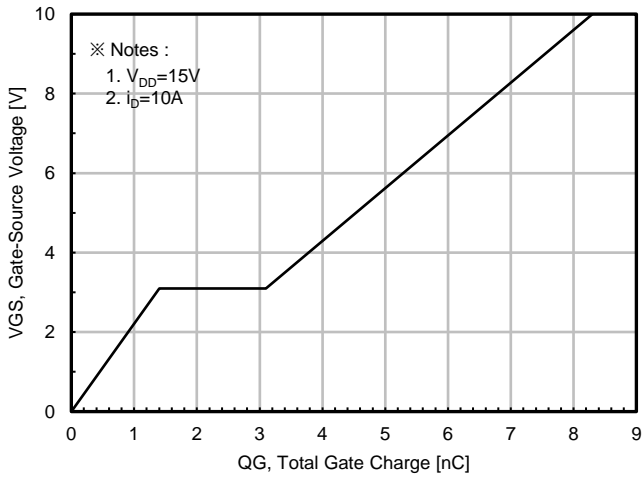


**Fig. 5. Transfer Characteristics**

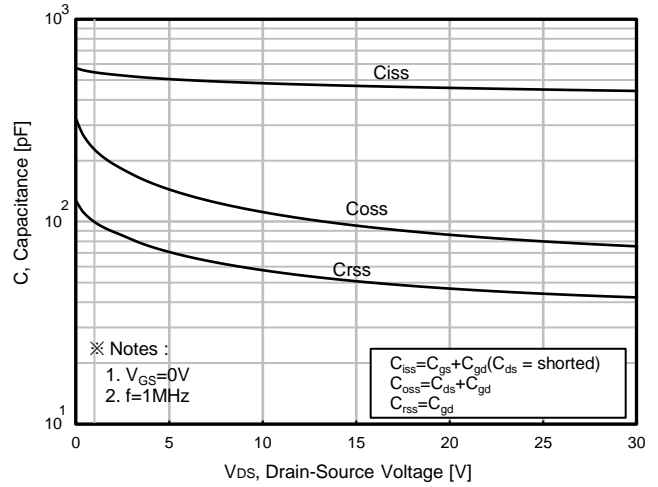


**Fig. 6. Body Diode Forward Voltage Variation with Source Current and Temperature**

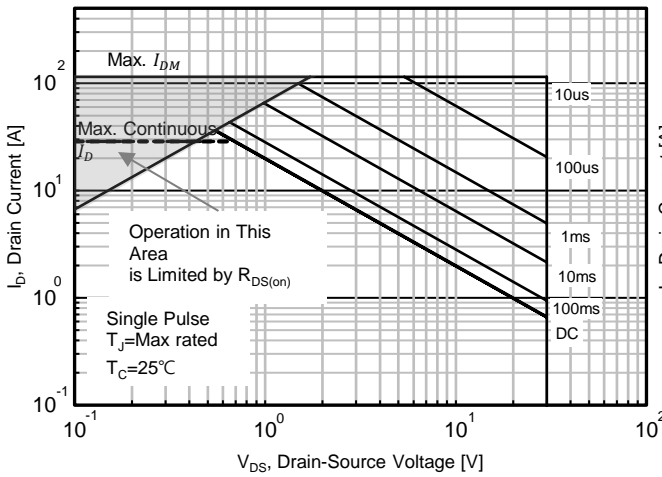
**ELECTRICAL CHARACTERISTICS DIAGRAMS (25 °C, unless otherwise noted)**



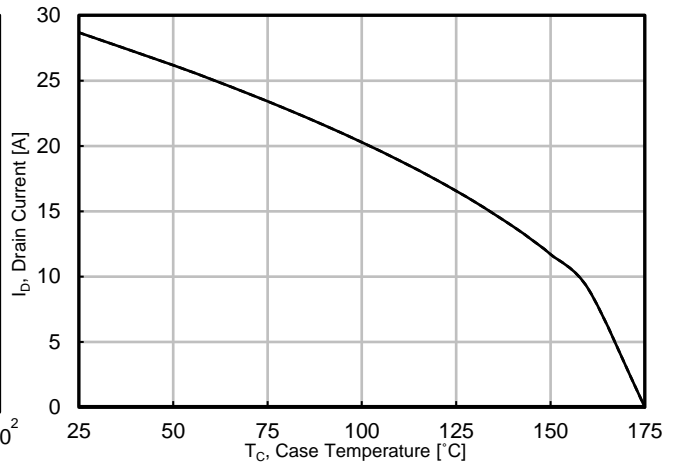
**Fig. 7. Gate Charge**



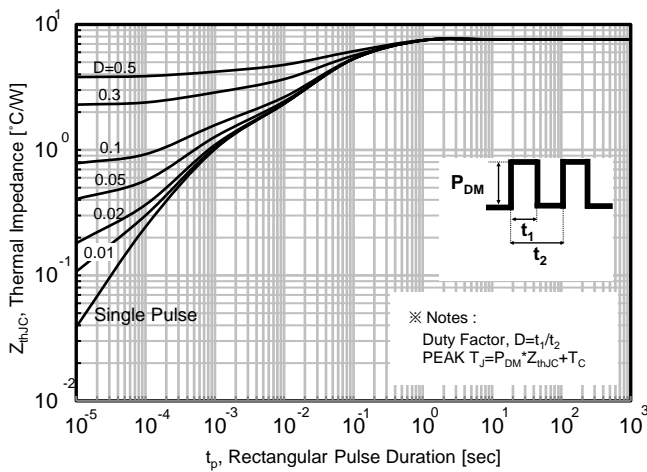
**Fig. 8. Capacitance**



**Fig. 9. Safe Operating Area, Junction-to-Ambient**



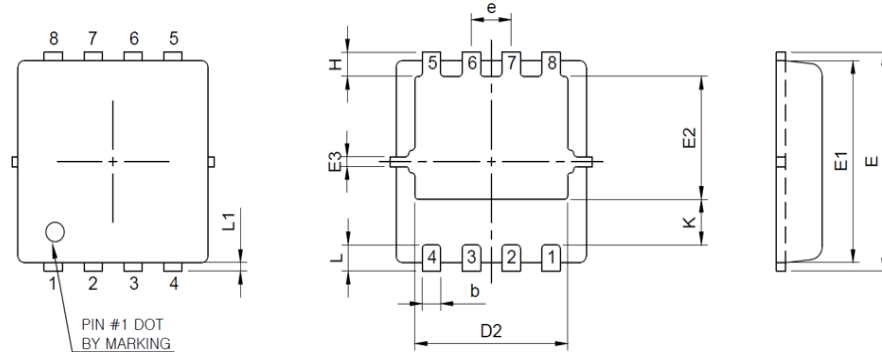
**Fig. 10. Maximum Drain vs. Case Temperature**



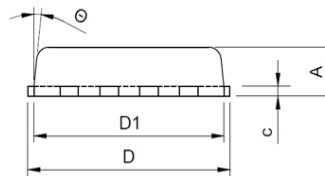
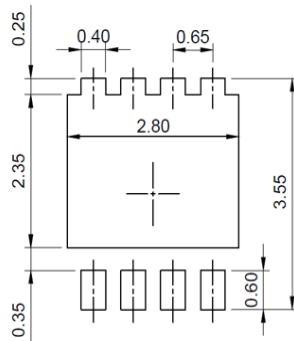
**Fig.11 Transient Thermal Response Curve(Rthjc)**

# Package information

PDFN33



Land Pattern  
(Only for Reference)




SYMBOL	DIMENSION [mm]	
	MIN	MAX
A	0.80	0.90
b	0.23	0.40
c	0.12	0.25
D	3.30 BSC	
D1	2.95	3.20
D2	2.28	2.73
E	3.30 BSC	
E1	2.95	3.20
E2	1.90	2.35
E3	0.20	
e	0.65 BSC	
k	0.60	0.95
L	0.15	0.56
L1	0.05	0.20
H	0.15	0.51
Θ	0°	12°

## Notes

Package body size, length and width do not include mold flash, protrusions and gate burrs.

**DISCLAIMER :**

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