



AMDV040N042LVRH

Automotive MOSFET 40V 4.2mΩ 80A

FEATURES

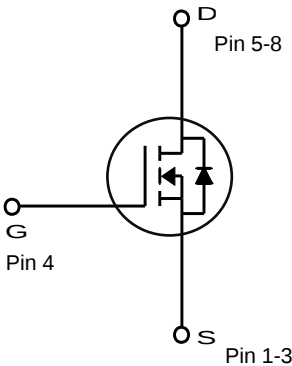
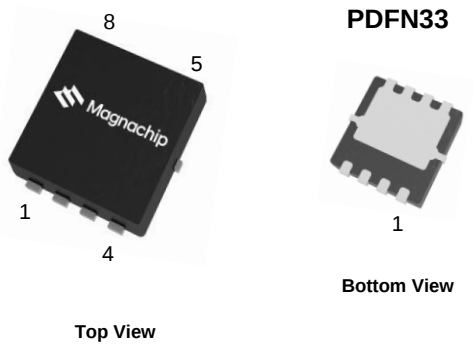
- Trench power MOSFET technology
- Single N-channel, Logic level
- Enhanced avalanche ruggedness
- 100% Avalanche tested
- Maximum 175°C junction temperature
- AEC-Q101 qualified and PPAP capable

APPLICATIONS

- Switching applications
- Motor drive systems

KEY PERFORMANCE PARAMETERS

V_{DS}	40	V
$R_{DS(on), typ.}$	0.0031	Ω
I_D	80	A
Q_G	22	nC
Junction temperature _{, max}	175	°C



RoHS Compliant
HALOGEN-FREE



ORDERING INFORMATION

Type / Ordering Code	Package	Marking	Packing	RoHS Status
AMDV040N042LVRH	PDFN33	040N042L	Tape & Reel	Halogen Free

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

ABSOLUTE MAXIMUM RATINGS, at T_C = 25°C, unless otherwise specified

PARAMETER		SYMBOL	RATING	UNIT
Drain-source Voltage		V _{DS}	40	V
Gate-source Voltage		V _{GS}	± 20	
Drain current	Tc=25°C (Silicon Limited)	I _D	87	A
	Tc=25°C (Package Limited)		80	
	Tc=100°C		62	
¹⁾ Pulsed drain current	Tc=25°C	I _{DM}	320	
Total power dissipation	Tc=25°C	P _{tot}	58	W
	Tc=100°C		29	
²⁾ Avalanche energy, single pulse		E _{AS}	50	mJ
Operating and storage temperature		T _j , T _{stg}	- 55 ~ 175	°C

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATING	UNIT
Thermal resistance, junction - case	R _{θJC}	2.6	K/W
³⁾ Thermal resistance, junction - ambient	R _{θJA}	60	

ELECTRICAL CHARACTERISTICS (T_J = 25°C)**STATIC CHARACTERISTICS**

PARAMETER	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Drain-source breakdown voltage	V _{(BR)DSS}	40	-	-	V	V _{GS} =0 V, I _D =250 μA
Gate threshold voltage	V _{GS(th)}	1.2	-	2.5	V	V _{DS} =V _{GS} , I _D =250 μA
Zero gate voltage drain current	I _{DSS}	-	-	1	μA	V _{DS} =40 V, V _{GS} =0 V
Gate-source leakage current	I _{GSS}	-	-	± 100	nA	V _{GS} =±20 V, V _{DS} =0 V
Drain-source on-state resistance	R _{DS(on)}	-	4.8	6.9	mΩ	V _{GS} =4.5 V, I _D =20 A
		-	3.1	4.2		V _{GS} =10 V, I _D =20 A
⁴⁾ Gate resistance	R _G	-	3.0	-	Ω	f=1 MHz
⁴⁾ Transconductance	g _{fs}	-	72	-	S	V _{DS} =10 V, I _D =40 A

⁴⁾ DYNAMIC CHARACTERISTICS

PARAMETER	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Input capacitance	C _{iss}	-	1452	-	pF	V _{GS} =0 V, V _{DS} =20 V, f=1 MHz
Output capacitance	C _{oss}	-	345	-		
Reverse transfer capacitance	C _{rss}	-	29	-		
Turn-on delay time	t _{d(on)}	-	10	-	ns	V _{DD} =20 V, V _{GS} =10 V, I _D =40 A, R _{G,ext} =3 Ω
Rise time	t _r	-	6	-		
Turn-off delay time	t _{d(off)}	-	36	-		
Fall time	t _f	-	7	-		

⁴⁾ GATE CHARGE CHARACTERISTICS

PARAMETER	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Gate to source charge	Q _{gs}	-	5	-	nC	V _{DD} =32 V, I _D =40 A, V _{GS} =0 to 10 V
Gate charge at threshold	Q _{gs(th)}	-	3	-		
Gate to drain charge	Q _{gd}	-	3	-		
Switching charge	Q _{sw}	-	6	-		
Gate charge total	Q _g	-	22	-		
Gate plateau voltage	V _{plateau}	-	3.6	-	V	

SOURCE-DRAIN DIODE

PARAMETER	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
⁴⁾ Diode continuous forward current	I _S	-	-	80	A	-
⁴⁾ Diode pulse current	I _{S,pulse}	-	-	320		pulsed; t _p ≤ 10 μs
Diode forward voltage	V _{SD}	-	0.8	1.1	V	V _{GS} =0 V, I _F =20 A
⁴⁾ Reverse recovery time	t _{rr}	-	39	-	ns	I _F =40 A, dI _F /dt=100 A/μs
⁴⁾ Reverse recovery charge	Q _{rr}	-	41	-	nC	I _F =40 A, dI _F /dt=100 A/μs

Notes

- Pulse width limited by T_{Jmax}
- Starting T_J=25°C, L=1mH, I_{AS}=10A, V_{DD}=36V, V_{GS}=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)

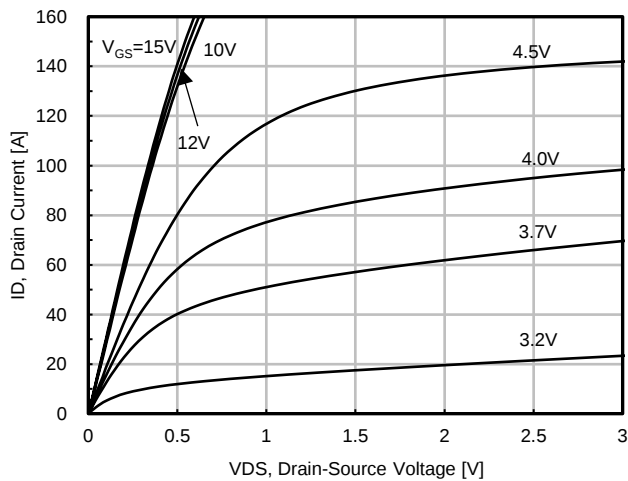


Fig. 1. Typ. Output Characteristics

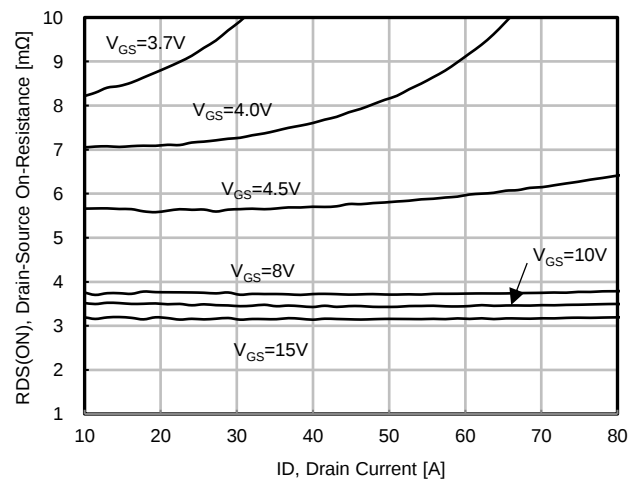


Fig. 2. Typ. Drain to Source On-Resistance

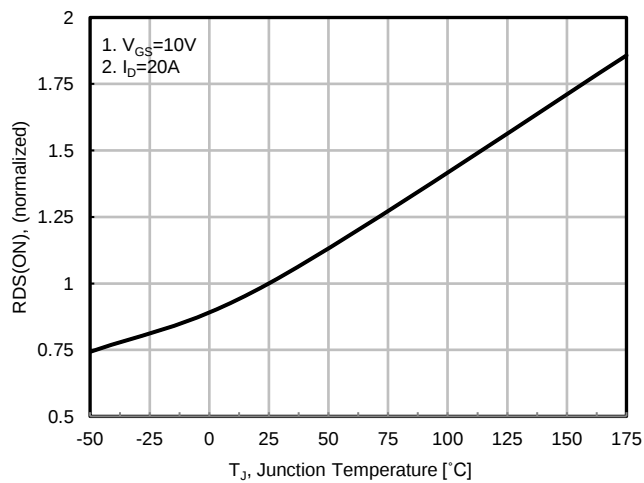


Fig. 3. On-Resistance vs. Junction Temperature

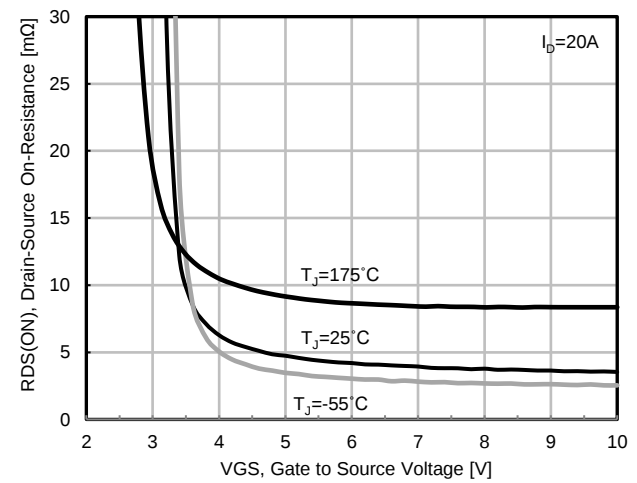


Fig. 4. On-Resistance vs. Gate to source Voltage

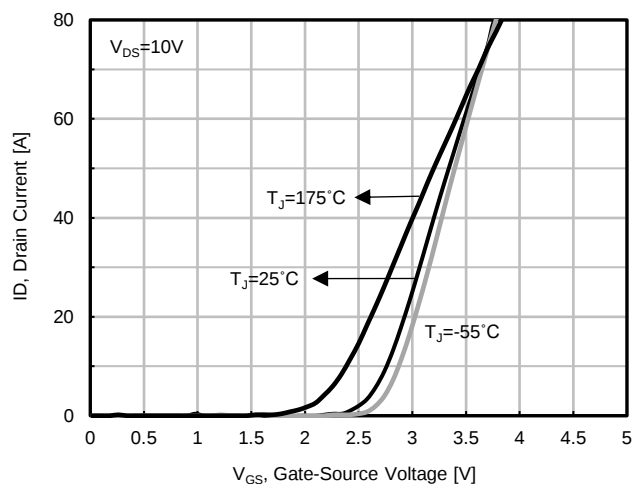


Fig. 5. Typ. Transfer Characteristics

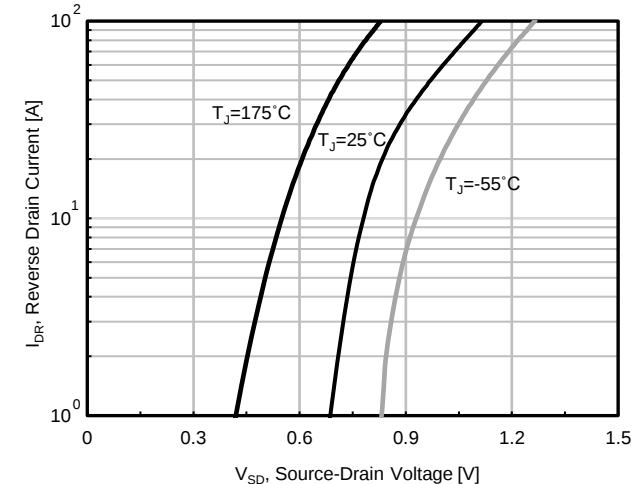
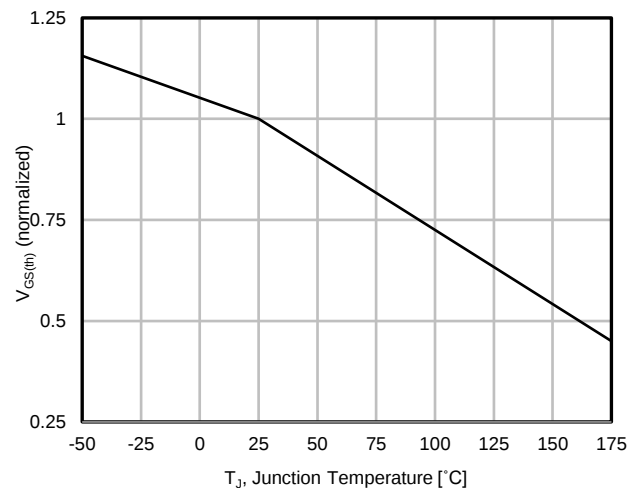
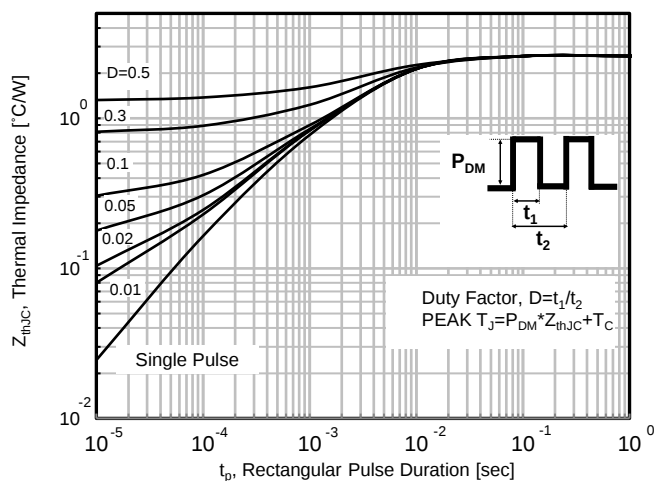
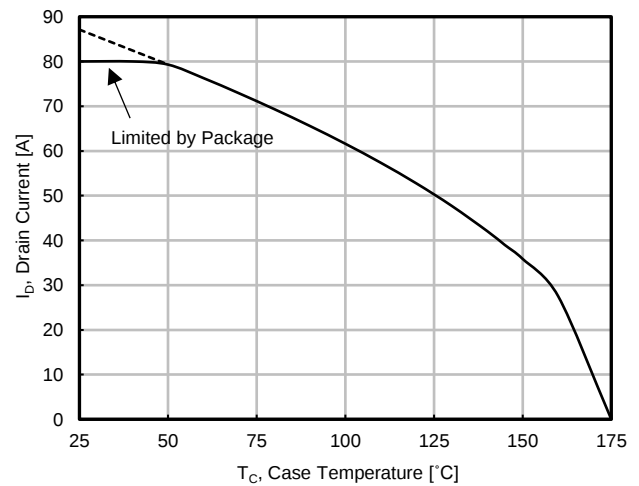
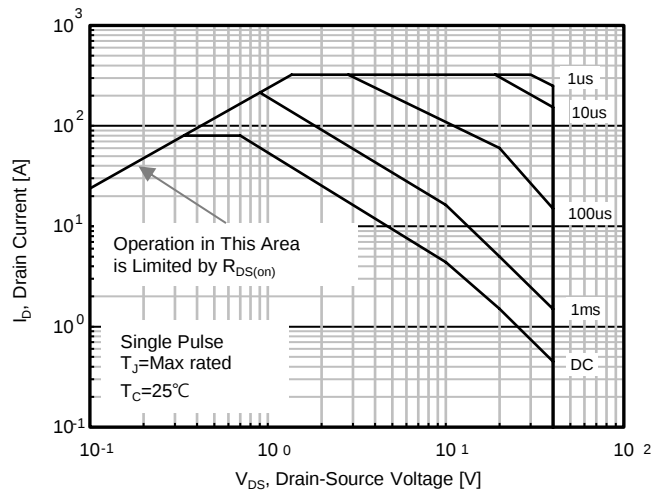
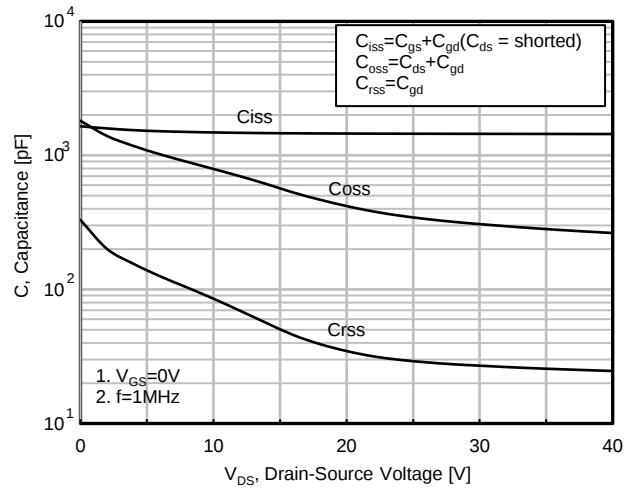
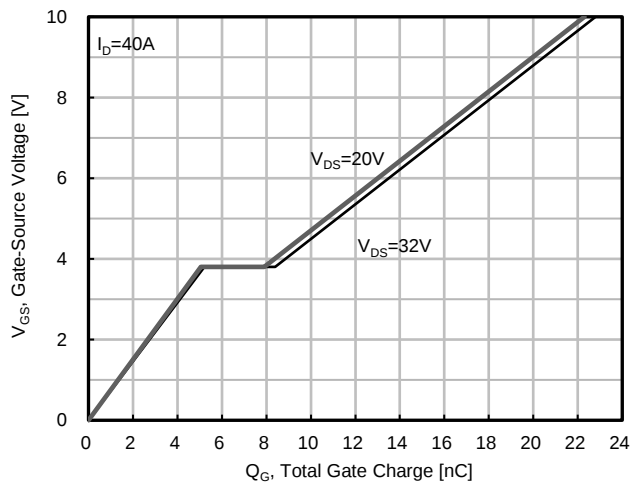


Fig. 6. Forward Characteristics of Reverse Diode

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



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

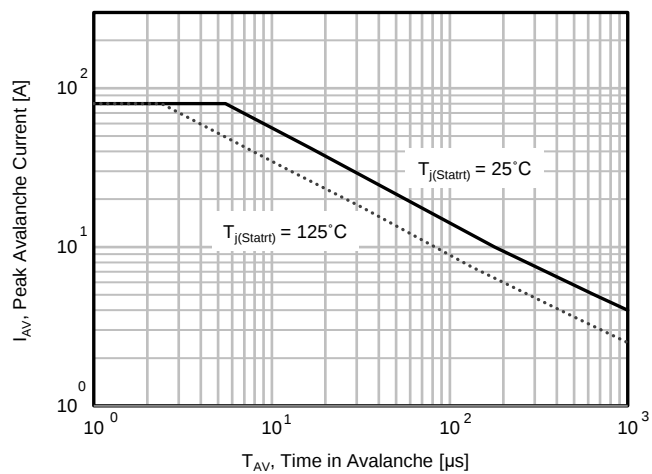
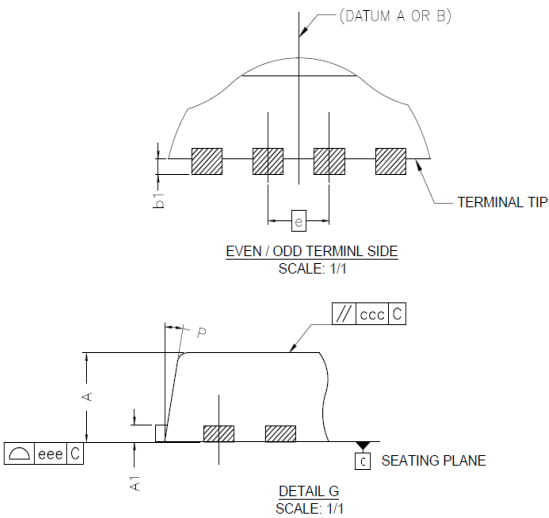
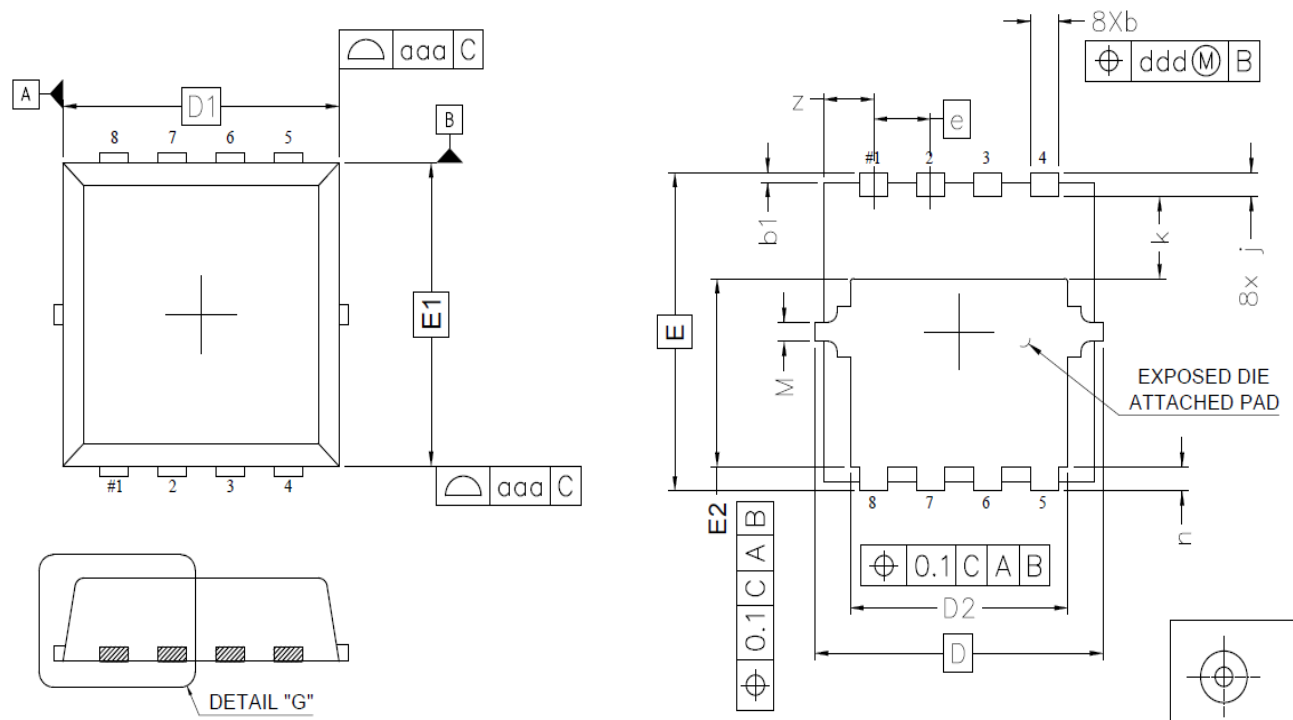


Fig. 13. Avalanche Characteristics

Package Outlines

PDFN33



SYMBOL	MIN	MAX	SYMBOL	MIN	MAX
A	0.80	0.90	M	0.20	
A1	0.12	0.22	P	9°	11°
b	0.22	0.42	z	0.58	
b1	0.05	0.15	aaa	0.10	
D	3.30 BSC		ccc	0.10	
D1	3.10 BSC		ddd	0.05	
D2	2.29	2.69	eee	0.05	
E	3.30 BSC				
E1	3.10 BSC				
E2	1.85	2.05			
e	0.65 BSC				
j	0.15	0.35			
k	0.75	0.95			
n	0.15	0.35			

Notes

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

DISCLAIMER :

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