



AMDD040P067RH

Single P-channel Trench MOSFET -40V 6.7mΩ -90A

FEATURES

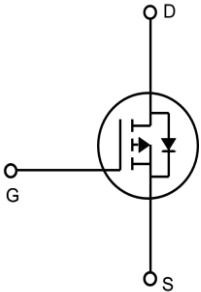
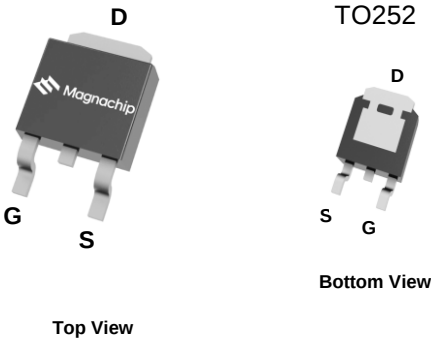
- Trench power MOSFET technology
- P-channel, logic level
- 100% Avalanche tested
- Maximum 175°C junction temperature
- AEC-Q101 qualified

APPLICATIONS

- DC/DC and AC/DC converters
- Switching applications

KEY PERFORMANCE PARAMETERS

V_{DS}	-40	V
$R_{DS(on), typ}$	0.0062	Ω
I_D (Package limited)	-90	A
Q_G	91	nC
Junction temperature, max	175	$^{\circ}C$



ORDERING INFORMATION

Type / Ordering Code	Package	Marking	Packing	RoHS Status
AMDD040P067RH	TO252	040P067	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}	-40	V
Gate-source Voltage		V_{GS}	± 18	V
Drain current	$T_C=25^{\circ}\text{C}$ (Package limited)	I_D	-90	A
	$T_C=25^{\circ}\text{C}$ (Silicon limited)		-105	A
	$T_C=100^{\circ}\text{C}$		-74	A
¹⁾ Pulsed drain current	$T_C=25^{\circ}\text{C}$	I_{DM}	-360	A
Total power dissipation	$T_C=25^{\circ}\text{C}$	P_{tot}	115	W
	$T_C=100^{\circ}\text{C}$		58	W
²⁾ Avalanche energy, single pulse		E_{AS}	153	mJ
Operating and storage temperature		T_j, T_{stg}	- 55 ~ 175	$^{\circ}\text{C}$

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	RATING	UNIT
Thermal resistance, junction - case	$R_{\theta JC}$	1.3	$^{\circ}\text{C/W}$
³⁾ Thermal resistance, junction - ambient	$R_{\theta JA}$	40	$^{\circ}\text{C/W}$

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$)**STATIC CHARACTERISTICS**

PARAMETER	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Drain-source breakdown voltage	$V_{(BR)DSS}$	-40	-	-	V	$V_{GS}=0\text{ V}$, $I_D=-250\text{ }\mu\text{A}$
Gate threshold voltage	$V_{GS(th)}$	-1.1	-1.8	-2.8		$V_{DS}=V_{GS}$, $I_D=-250\text{ }\mu\text{A}$
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	$V_{DS}=-40\text{ V}$, $V_{GS}=0\text{ V}$
Gate-source leakage current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 18\text{ V}$, $V_{DS}=0\text{ V}$
Drain-source on-state resistance	$R_{DS(on)}$	-	6.2	6.7	m Ω	$V_{GS}=-10\text{ V}$, $I_D=-45\text{ A}$
		-	8.4	15.4		$V_{GS}=-4.5\text{ V}$, $I_D=-27\text{ A}$
⁴⁾ Gate resistance	R_G	-	8.5	-	Ω	$f=1\text{ MHz}$
⁴⁾ Transconductance	g_{fs}	-	80	-	S	$V_{DS}=-10\text{ V}$, $I_D=-45\text{ A}$

⁴⁾ DYNAMIC CHARACTERISTICS

PARAMETER	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Input capacitance	C_{iss}	-	4,374	-	pF	$V_{GS}=0\text{ V}$, $V_{DS}=-20\text{ V}$, $f=1\text{ MHz}$
Output capacitance	C_{oss}	-	701	-		
Reverse transfer capacitance	C_{rss}	-	373	-		
Turn-on delay time	$t_{d(on)}$	-	17	-	ns	$V_{DD}=-20\text{ V}$, $V_{GS}=-10\text{ V}$, $I_D=-45\text{ A}$, $R_{G,ext}=3\Omega$
Rise time	t_r	-	9	-		
Turn-off delay time	$t_{d(off)}$	-	112	-		
Fall time	t_f	-	57	-		

⁴⁾ GATE CHARGE CHARACTERISTICS

PARAMETER	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
Gate to source charge	Q_{gs}	-	17	-	nC	$V_{DD}=-20\text{ V}$, $I_D=-45\text{ A}$, $V_{GS}=0\text{ to }-10\text{ V}$
Gate charge at threshold	$Q_{gs(th)}$	-	7	-		
Gate to drain charge	Q_{gd}	-	17	-		
Switching charge	Q_{sw}	-	26	-		
Gate charge total	Q_g	-	91	-		
Gate plateau voltage	$V_{plateau}$	-	-3.7	-	V	

SOURCE-DRAIN DIODE

PARAMETER	Symbol	Min.	Typ.	Max.	Unit	Conditions / Note
⁴⁾ Diode continuous forward current	I_S	-	-	-90	A	-
⁴⁾ Diode pulse current	$I_{S,pulse}$	-	-	-360		pulsed; $t_p \leq 10\text{ }\mu\text{s}$
Diode forward voltage	V_{SD}	-	-0.9	-1.2	V	$V_{GS}=0\text{ V}$, $I_F=-45\text{ A}$
⁴⁾ Reverse recovery time	t_{rr}	-	81	-	ns	$I_F=-45\text{ A}$, $dI_F/dt=100\text{ A}/\mu\text{s}$
⁴⁾ Reverse recovery charge	Q_{rr}	-	101	-	nC	

Notes

- Pulse width limited by T_{Jmax}
- Starting $T_J=25^\circ\text{C}$, $L=1\text{ mH}$, $I_{AS}=-16.5\text{ A}$, $V_{DD}=-20\text{ V}$, $V_{GS}=-10\text{ V}$
- 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)

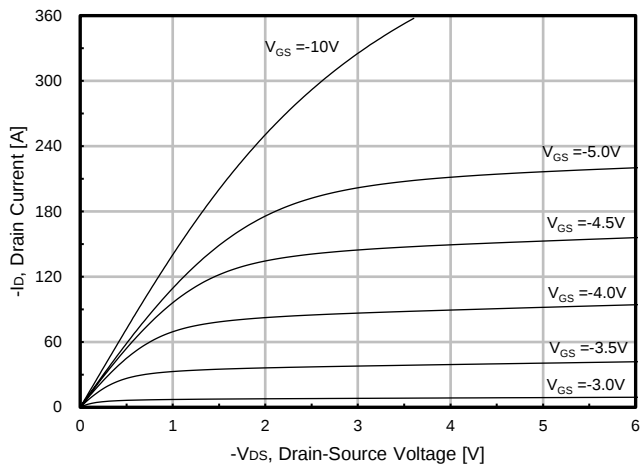


Fig. 1. Output Characteristics (25°C)

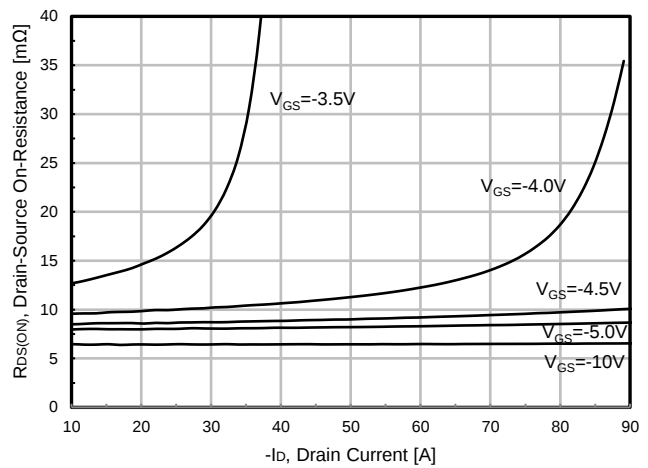


Fig. 2. Static On-Resistance Variation

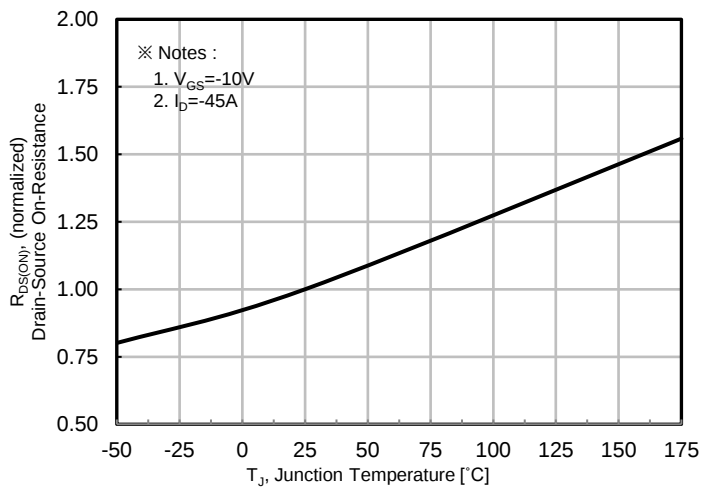


Fig. 3. On-Resistance vs. Junction Temperature

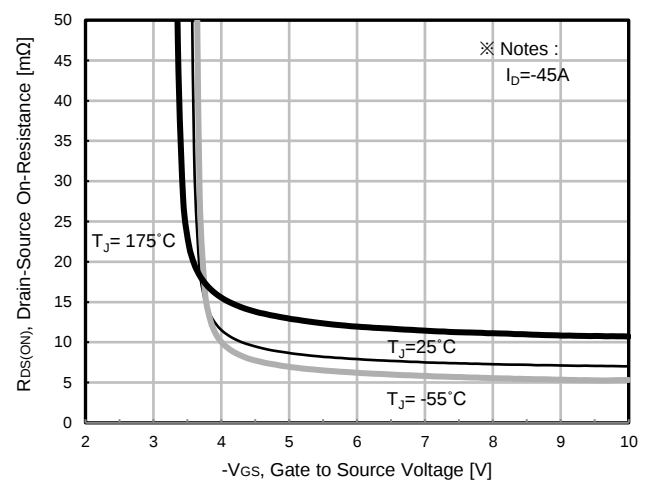


Fig. 4. On-Resistance vs. Gate to source Voltage

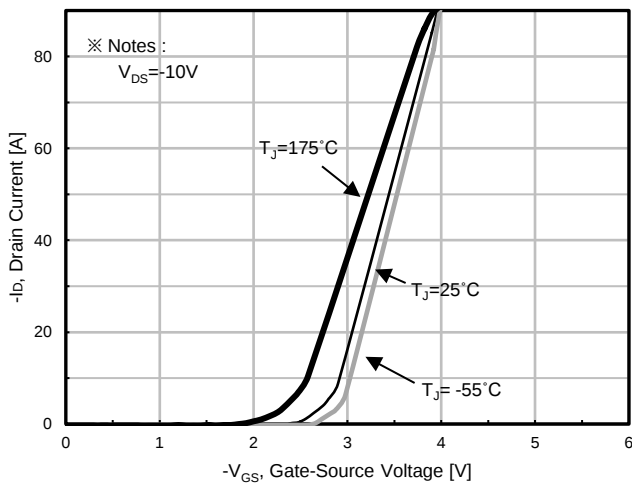


Fig. 5. Transfer Characteristics

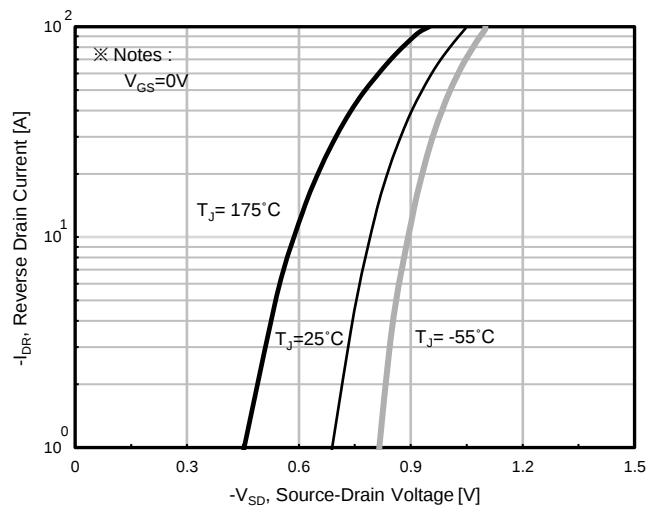
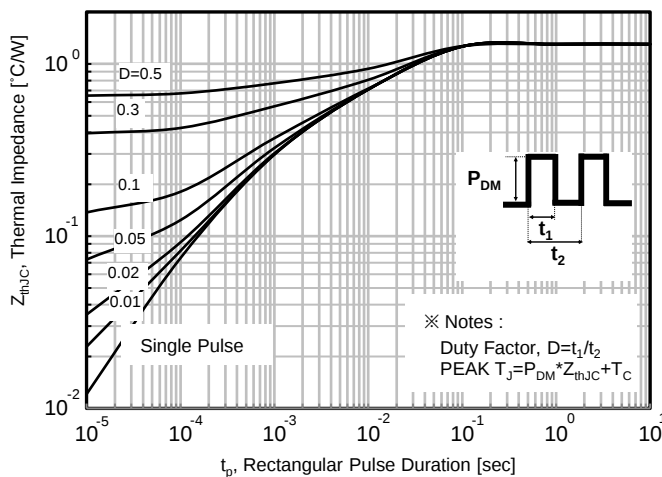
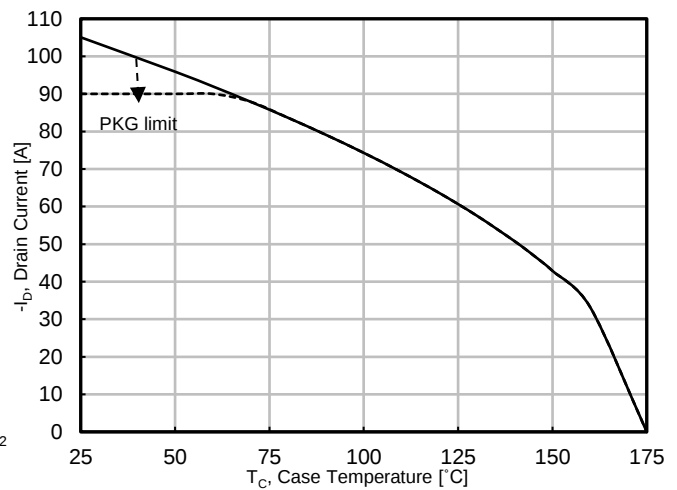
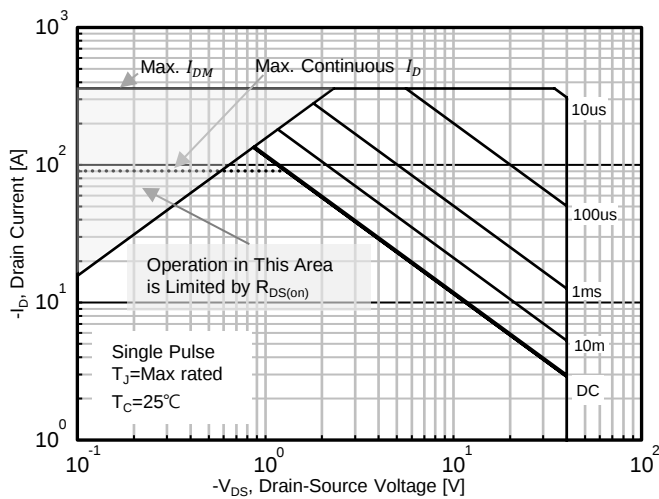
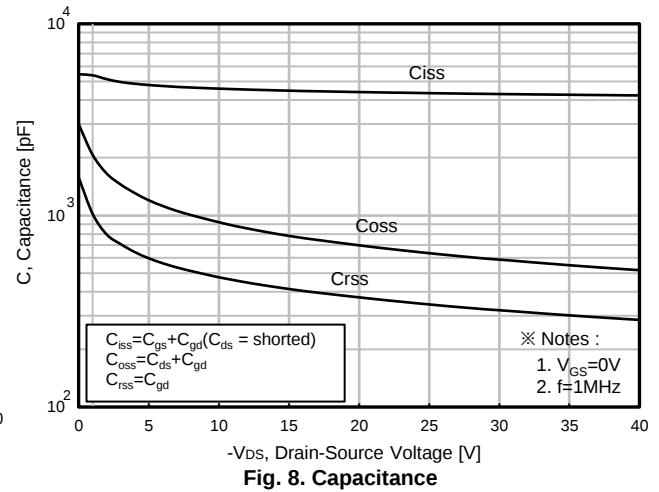
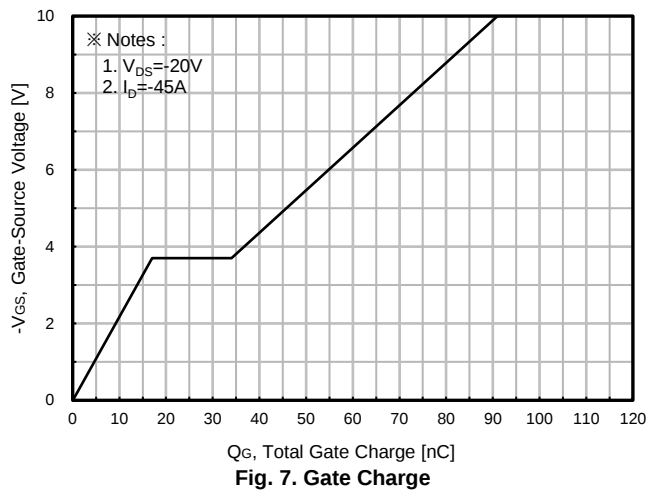


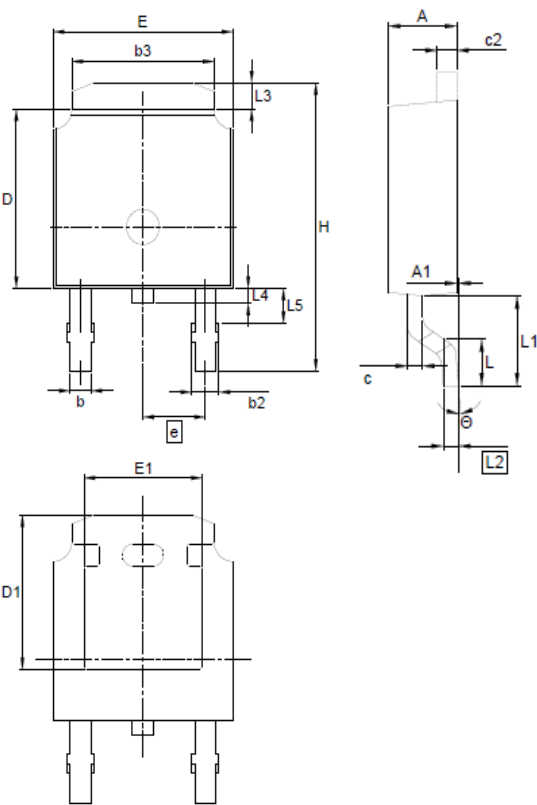
Fig. 6. Body Diode Forward Voltage Variation with Source Current and Temperature

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



Package information

T0252



Symbol	Dimension (mm)		
	Min	Nom	Max
A	2.18	–	2.39
A1	–	–	0.13
b	0.64	–	0.89
b2	0.76	–	1.14
b3	4.95	–	5.46
c	0.46	–	0.61
c2	0.46	–	0.89
D	5.97	6.10	6.22
D1	5.21	–	6.00
E	6.35	–	6.73
E1	4.32	–	5.20
e	2.286 BSC		
H	9.40	–	10.41
L	1.40	1.52	1.78
L1	2.74 REF		
L2	0.508 BSC		
L3	0.89	–	1.27
L4	0.42	–	1.02
L5	1.14	–	1.52
Θ	0°	–	10°

Notes

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

DISCLAIMER :

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