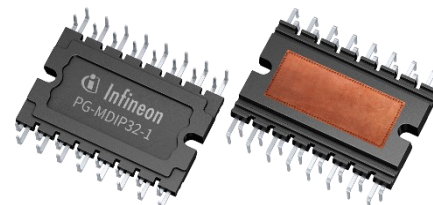


# CIPOS™ Prime

## AMF12S18LB2Z

### Features

- 1200 V SiC MOSFET 4-pack
- 18 mΩ of typical  $R_{DS(on)}$  at  $V_{GS} = 18\text{ V}$ ,  $T_J = 25^\circ\text{C}$
- Maximum operating  $T_J = 175^\circ\text{C}$
- Very low switching losses
- Robust against parasitic turn on, 0 V turn-off gate voltage can be applied
- Robust body diode for hard commutation
- High performance AlN DCB substrate
- Integrated NTC thermistor



### Potential applications

- On-board charger
- DC-DC converter
- EV charging
- Power conversion AC-DC, DC-AC

### Product validation

Qualified for automotive applications

Product validation according to AEC-Q101 / 200 and AQG 324

### Description

The CIPOS™ Prime product offers an integrated solution for high frequency power conversion applications. The power module includes four SiC MOSFETs and a NTC and enables high power density. Infineon's SiC technology provides excellent switching performance, wide range of gate-source voltage, and benchmark gate threshold voltage. The DCB substrate enables optimal thermal performance and package is designed to ensure a high creepage distance.

**Table 1** Product Information

Base Part Number	Package Type	Standard Pack		Sales Product Number
		Form	MOQ	
AMF12S18LB2Z	DIP 44x28DA	11 pcs / Tube	176 pcs	SP006061250



**Table of contents**

Features ..... 1

Potential applications ..... 1

Product validation ..... 1

Description ..... 1

Table of contents ..... 2

1 MOSFET ..... 3

2 MOSFET body diode ..... 5

3 Package ..... 6

4 Thermistor ..... 7

5 Characteristics diagrams ..... 8

6 Pin description ..... 13

7 Package outline ..... 14

Revision history ..... 15

## 1 MOSFET

**Table 2 Maximum ratings**

Description	Symbol	Condition	Values	Unit
Drain-source voltage	$V_{DS}$	$T_J \geq 25^\circ\text{C}$	1200	V
Continuous drain current for $R_{th(j-c)}$ , limited by $T_{J,max}$	$I_D$	$V_{GS} = 18\text{ V}, T_C = 25^\circ\text{C}$	83	A
		$V_{GS} = 18\text{ V}, T_C = 100^\circ\text{C}$	59	
Peak drain current, $t_p$ limited by $T_{J,max}$	$I_{DM}$	$V_{GS} = 18\text{ V}$	177	A
Gate-source voltage, max. transient voltage	$V_{GS}$	$t_p \leq 0.5\ \mu\text{s}, D < 0.01$	-10 ~ 23	V
Gate-source voltage, max. static voltage	$V_{GS}$		-5 ~ 20	V
Power dissipation per switch	$P_D$		300	W
Operating junction temperature	$T_J$		-40 ~ 175	$^\circ\text{C}$

**Table 3 Recommended values**

Description	Symbol	Condition	Values	Unit
Turn-on gate-source voltage	$V_{GS(on)}$		15 ~ 18	V
Turn-off gate-source voltage	$V_{GS(off)}$		-3 ~ 0	V

**Table 4 Electrical characteristics**

( $T_J = 25^\circ\text{C}$  if not stated otherwise)

Description	Symbol	Condition	Values			Unit
			Min.	Typ.	Max.	
Drain-source on-state resistance	$R_{DS(on)}$	$I_D = 37.4\text{ A}, V_{GS} = 18\text{ V}$		18	26.4	m $\Omega$
		$I_D = 37.4\text{ A}, V_{GS} = 18\text{ V}, T_J = 175^\circ\text{C}$		43		
		$I_D = 37.4\text{ A}, V_{GS} = 15\text{ V}$		22		
Gate-source threshold voltage	$V_{GS(th)}$	$I_D = 11.8\text{ mA}, V_{DS} = V_{GS}$	3.5	4.2	5.1	V
		$I_D = 11.8\text{ mA}, V_{DS} = V_{GS}, T_J = 175^\circ\text{C}$		3.2		
Zero gate-voltage drain current	$I_{DSS}$	$V_{DS} = 1200\text{ V}, V_{GS} = 0\text{ V}$			350	$\mu\text{A}$
		$V_{DS} = 1200\text{ V}, V_{GS} = 0\text{ V}, T_J = 175^\circ\text{C}$		6		
Gate leakage current	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = 23\text{ V}$			120	nA
		$V_{DS} = 0\text{ V}, V_{GS} = -10\text{ V}$			-120	
Forward transconductance	$g_{fs}$	$I_D = 37.4\text{ A}, V_{DS} = 20\text{ V}$		17.6		S

**CIPOS™ Prime**  
**AMF12S18LB2Z**  
**MOSFET**



Description	Symbol	Condition	Values			Unit
			Min.	Typ.	Max.	
Internal gate resistance	$R_{G,int}$	$f = 1 \text{ MHz}, V_{AC} = 25 \text{ mV}$		4.8		$\Omega$
Input capacitance	$C_{iss}$	$V_{DS} = 800 \text{ V}, V_{GS} = 0 \text{ V}, f = 100 \text{ kHz}, V_{AC} = 25 \text{ mV}$		2704		pF
Output capacitance	$C_{oss}$			118		
Reverse transfer capacitance	$C_{rss}$			12		
$C_{oss}$ stored energy	$E_{oss}$			48		
Total gate charge	$Q_G$	$V_{DS} = 800 \text{ V}, I_D = 37.4 \text{ A}, V_{GS} = 0 \text{ to } 18 \text{ V}$		83		nC
Plateau gate charge	$Q_{GS(pl)}$			30		
Gate-to-drain charge	$Q_{GD}$			19		
Turn-on energy	$E_{on}$	$V_{DS} = 800 \text{ V}, I_D = 37.4 \text{ A}, V_{GS} = 0 \text{ to } 18 \text{ V}, R_G = 5 \Omega$		230		$\mu\text{J}$
		$V_{DS} = 800 \text{ V}, I_D = 37.4 \text{ A}, V_{GS} = 0 \text{ to } 18 \text{ V}, R_G = 5 \Omega, T_J = 175^\circ\text{C}$		285		
Turn-off energy	$E_{off}$	$V_{DS} = 800 \text{ V}, I_D = 37.4 \text{ A}, V_{GS} = 0 \text{ to } 18 \text{ V}, R_G = 5 \Omega$		370		$\mu\text{J}$
		$V_{DS} = 800 \text{ V}, I_D = 37.4 \text{ A}, V_{GS} = 0 \text{ to } 18 \text{ V}, R_G = 5 \Omega, T_J = 175^\circ\text{C}$		395		

## 2 MOSFET body diode

**Table 5** Maximum ratings

Description	Symbol	Condition	Values	Unit
Drain-source voltage	$V_{DSS}$	$T_J \geq 25^\circ\text{C}$	1200	V
Peak reverse drain current, $t_p$ limited by $T_{J,max}$	$I_{SM}$	$V_{GS} = 0\text{ V}$	86	A

**Table 6** Electrical characteristics

( $T_J = 25^\circ\text{C}$  if not stated otherwise)

Description	Symbol	Condition	Values			Unit
			Min.	Typ.	Max.	
Drain-source reverse voltage	$V_{SD}$	$I_{SD} = 37.4\text{ A}, V_{GS} = 0\text{ V}$		4.2	5.5	V
		$I_{SD} = 37.4\text{ A}, V_{GS} = 0\text{ V}, T_J = 175^\circ\text{C}$		4.05		
MOSFET reverse recovery charge	$Q_{rr}$	$V_{DS} = 800\text{ V}, I_{SD} = 37.4\text{ A}, V_{GS} = 0\text{ V}, di/dt = 1000\text{ A}/\mu\text{s}, Q_{rr}$ includes $Q_C$		0.51		$\mu\text{C}$
		$V_{DS} = 800\text{ V}, I_{SD} = 37.4\text{ A}, V_{GS} = 0\text{ V}, di/dt = 1000\text{ A}/\mu\text{s}, Q_{rr}$ includes $Q_C, T_J = 175^\circ\text{C}$		0.87		
MOSFET peak reverse recovery current	$I_{rrm}$	$V_{DS} = 800\text{ V}, I_{SD} = 37.4\text{ A}, V_{GS} = 0\text{ V}, di/dt = 1000\text{ A}/\mu\text{s}, Q_{rr}$ includes $Q_C$		28.2		A
		$V_{DS} = 800\text{ V}, I_{SD} = 37.4\text{ A}, V_{GS} = 0\text{ V}, di/dt = 1000\text{ A}/\mu\text{s}, Q_{rr}$ includes $Q_C, T_J = 175^\circ\text{C}$		39.4		
MOSFET reverse recovery energy	$E_{rr}$	$V_{DS} = 800\text{ V}, I_{SD} = 37.4\text{ A}, V_{GS} = 0\text{ V}, di/dt = 1000\text{ A}/\mu\text{s}, Q_{rr}$ includes $Q_C$		110		$\mu\text{J}$
		$V_{DS} = 800\text{ V}, I_{SD} = 37.4\text{ A}, V_{GS} = 0\text{ V}, di/dt = 1000\text{ A}/\mu\text{s}, Q_{rr}$ includes $Q_C, T_J = 175^\circ\text{C}$		140		

Package

### 3 Package

**Table 7** Characteristics and ratings

Description	Symbol	Condition	Values			Unit
			Min.	Typ.	Max.	
Storage temperature	$T_{stg}$		-40		125	°C
Thermal resistance, junction-case per switch	$R_{th(j-c)}$				0.62	K/W
Isolation voltage	$V_{ISO}$	1 min., RMS, f = 50 Hz	3.5			kV
Clearance distance		Pin to pin	2.4			mm
		Pin to flat heatsink	3.3			
Creepage distance		Pin to pin	5.5			
		Pin to DCB	12.12			
Comparative tracking index	CTI		600			V
Mounting torque		M3 SEMS screw	0.39	0.68	0.98	Nm
DCB flatness			0		120	μm
Weight				13.8		g

## 4 Thermistor

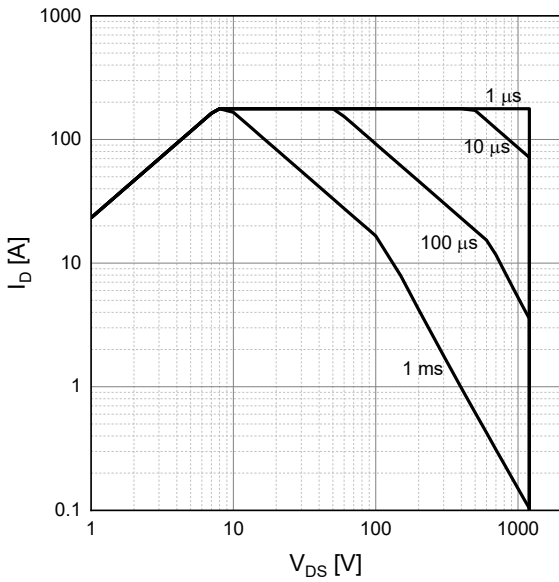
**Table 8** Characteristic values

Description	Symbol	Condition	Values			Unit
			Min.	Typ.	Max.	
Resistance	$R_{25}$	$T = 25^{\circ}\text{C}$		10		$\text{k}\Omega$
Tolerance			-2		2	%
Resistance	$R_{100}$	$T = 100^{\circ}\text{C}$		674.4		$\Omega$
Tolerance			-4.75		4.75	%
B-constant	B(25/50)	$T = 25^{\circ}\text{C}$ to $50^{\circ}\text{C}$		3946		K
	B(25/85)	$T = 25^{\circ}\text{C}$ to $85^{\circ}\text{C}$		3988		
	B(25/100)	$T = 25^{\circ}\text{C}$ to $100^{\circ}\text{C}$		4000		
Operating temperature range	$T_{\text{NTC}}$		-40		150	$^{\circ}\text{C}$

## 5 Characteristics diagrams

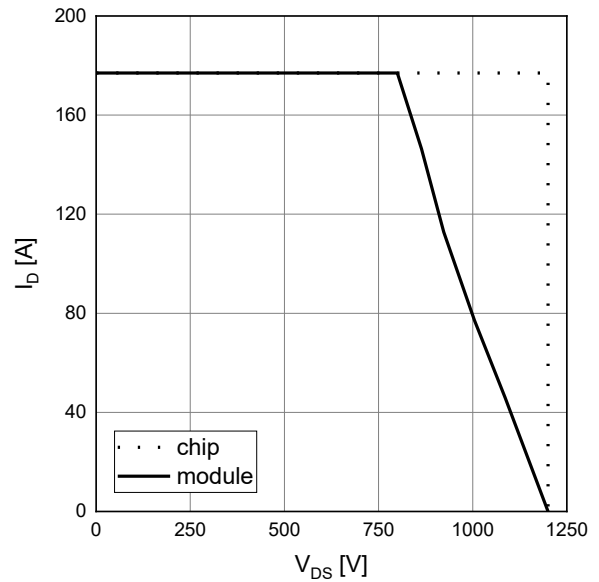
### Forward bias safe operating area (FBSOA)

$I_D = f(V_{DS})$ ,  $T_C = 25^\circ\text{C}$ ,  $D = 0$ , parameter:  $t_p$



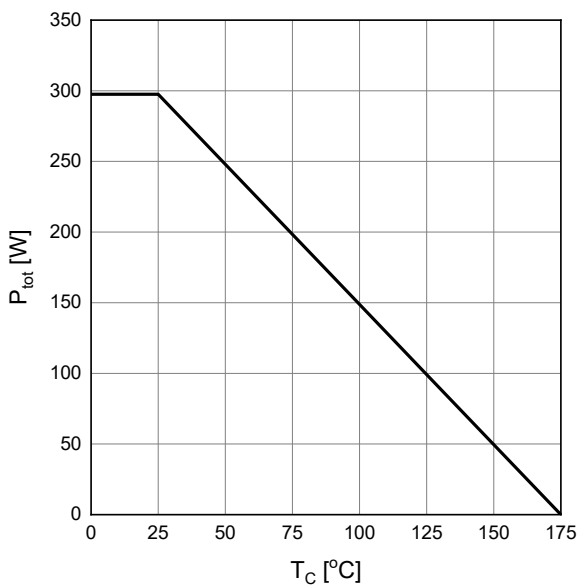
### Reverse bias safe operating area (RBSOA)

$I_D = f(V_{DS})$ ,  $V_{GS} = 0/18\ \text{V}$ ,  $T_J \leq 175^\circ\text{C}$ ,  $T_C = 25^\circ\text{C}$



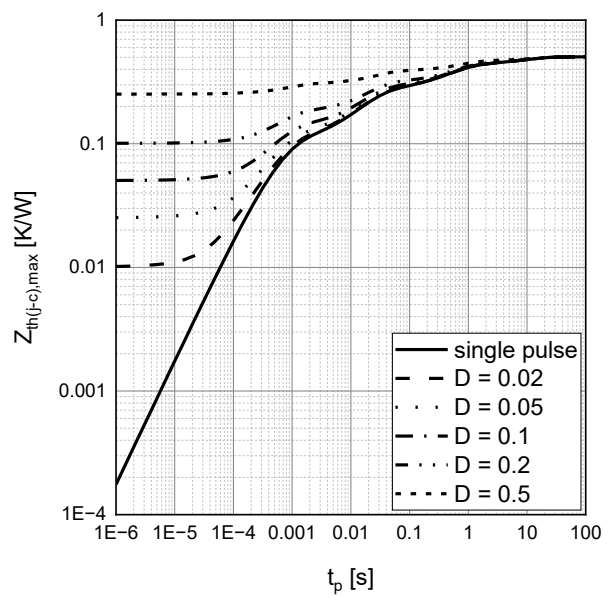
### Power dissipation

$P_{\text{tot}} = f(T_C)$



### Max. transient thermal impedance

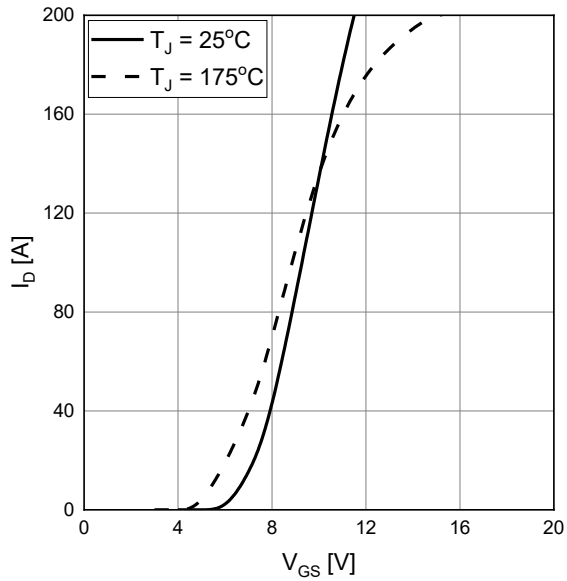
$Z_{\text{th}(j-c),\text{max}} = f(t_p)$ ,  $D = t_p/T$



Characteristics diagrams

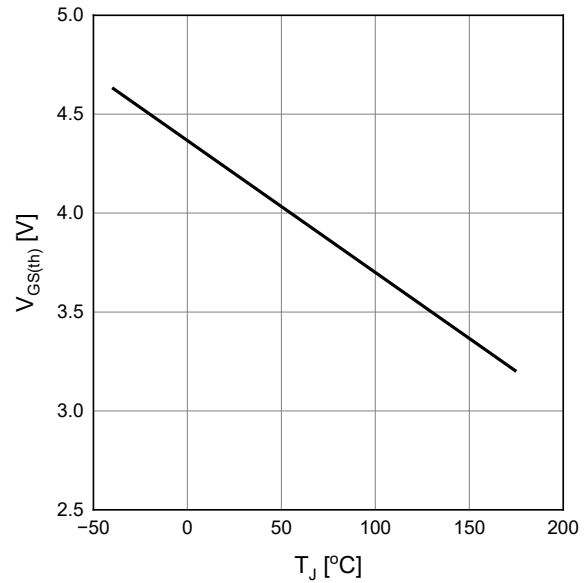
**Typical transfer characteristics**

$I_{DS} = f(V_{GS}), V_{DS} = 20\text{ V}$



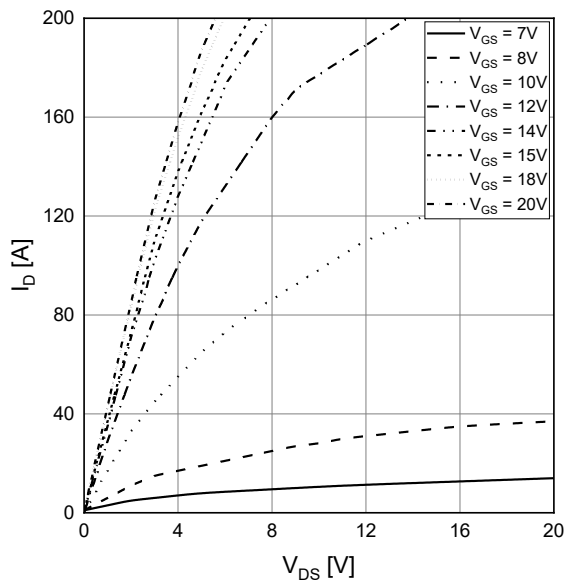
**Typical gate-source threshold voltage vs junction temperature**

$V_{GS(th)} = f(T_J), I_D = 11.8\text{ mA}$



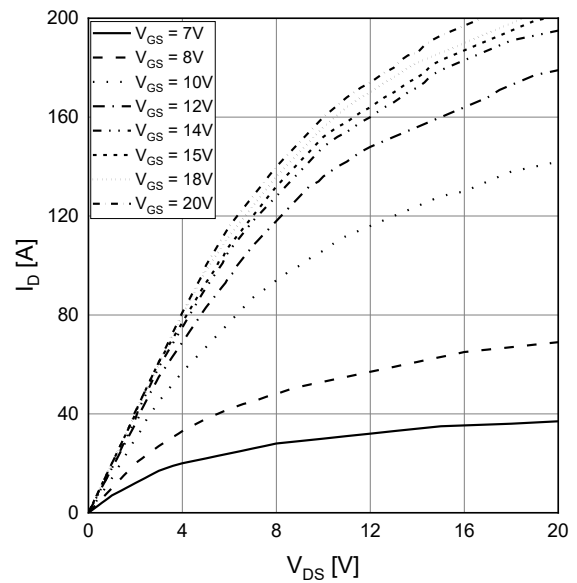
**Typical output characteristics**

$I_D = f(V_{DS}), T_J = 25^\circ\text{C}$



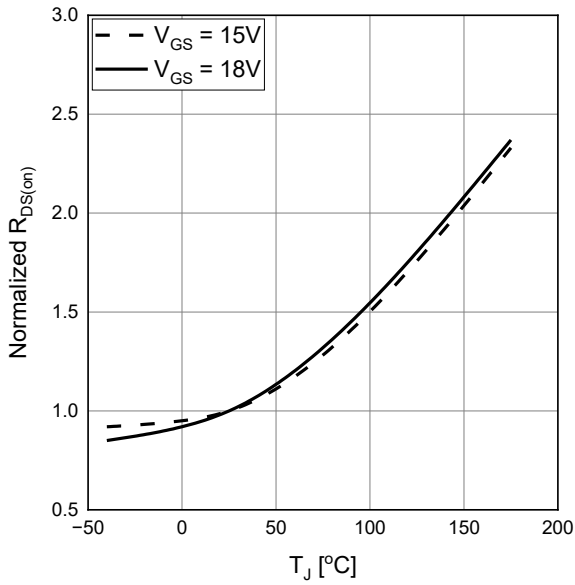
**Typical output characteristics**

$I_D = f(V_{DS}), T_J = 175^\circ\text{C}$



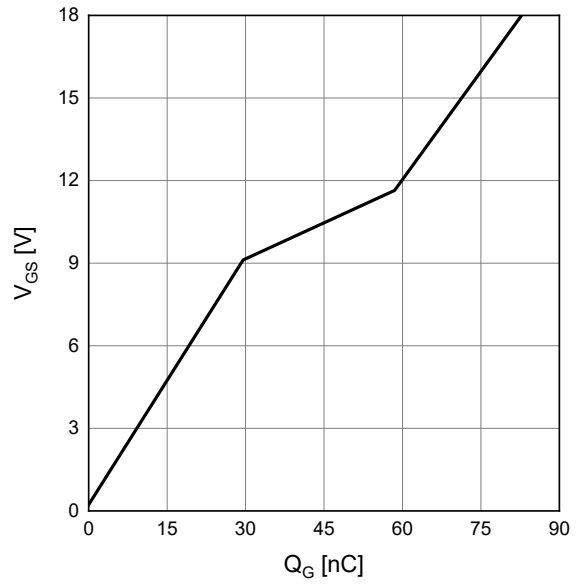
**Typical on-state resistance vs junction temperature**

$R_{DS(on)} = f(T_J), I_D = 37.4 \text{ A}$



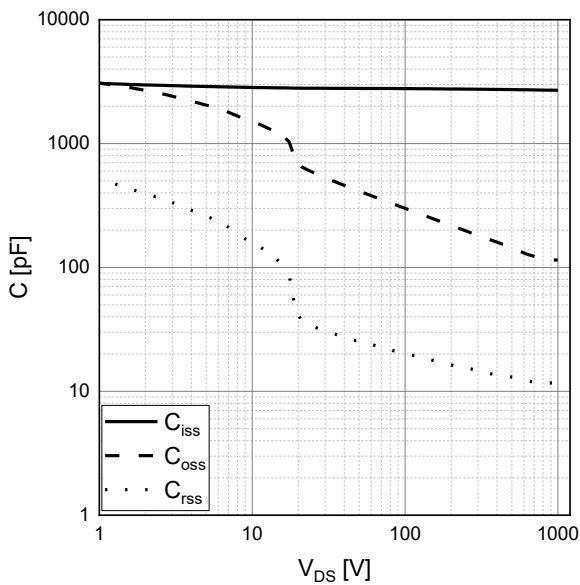
**Typical gate charge**

$V_{GS} = f(Q_G), I_D = 37.4 \text{ A}, V_{DS} = 800 \text{ V}$



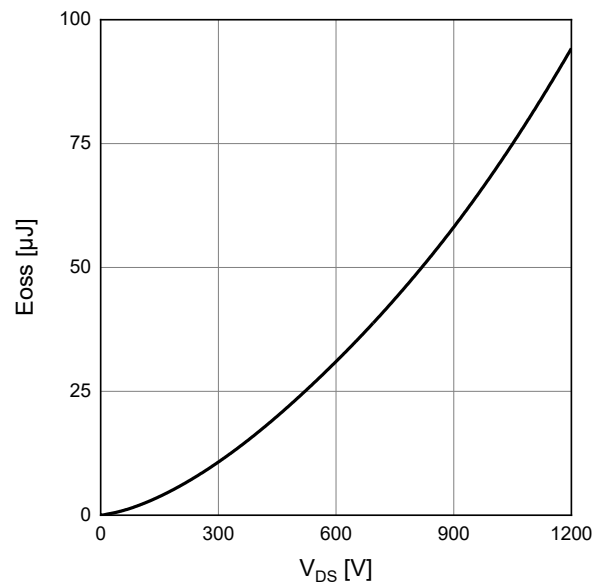
**Typical capacitance vs drain-source voltage**

$C = f(V_{DS}), f = 100 \text{ kHz}, V_{GS} = 0 \text{ V}$



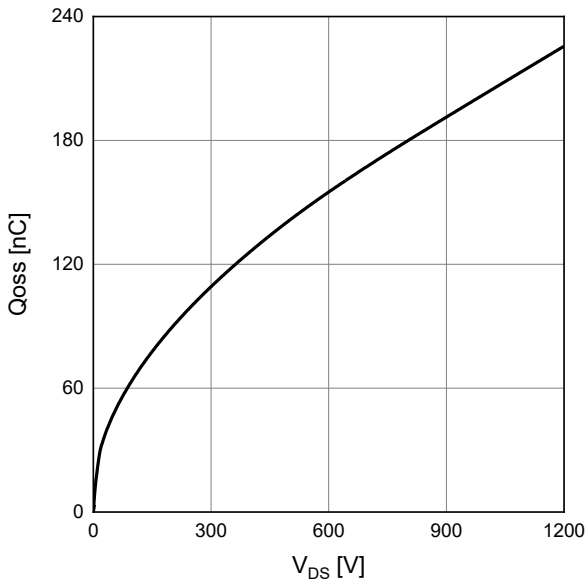
**Typical Coss stored energy**

$E = f(V_{DS})$



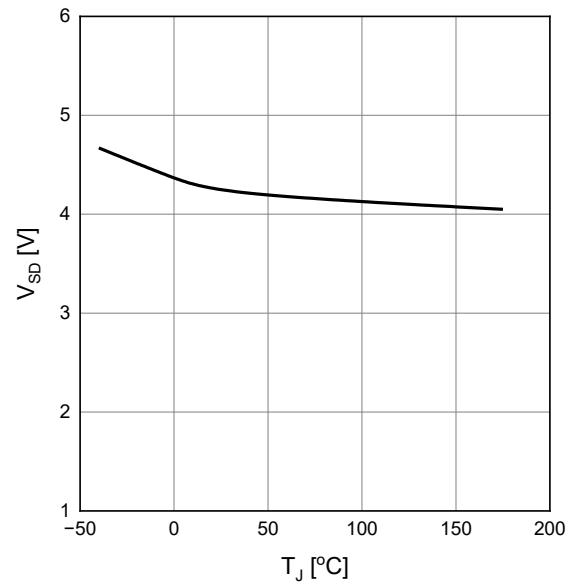
**Typical Coss stored charge**

$Q = f(V_{DS})$



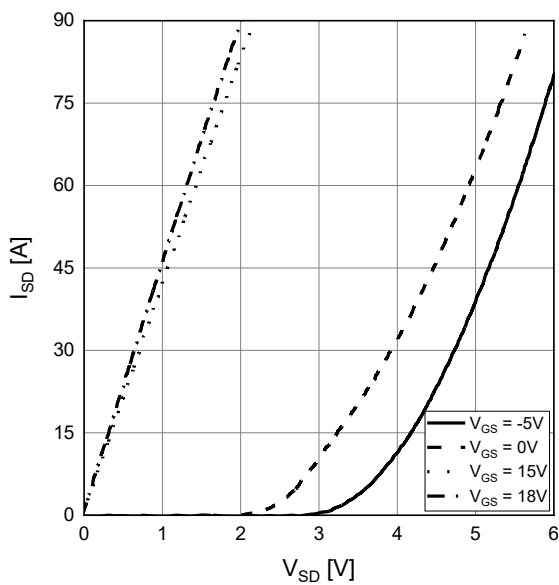
**Typical reverse drain voltage characteristics**

$V_{SD} = f(T_J), I_{SD} = 27.3 \text{ A}, V_{GS} = 0 \text{ V}$



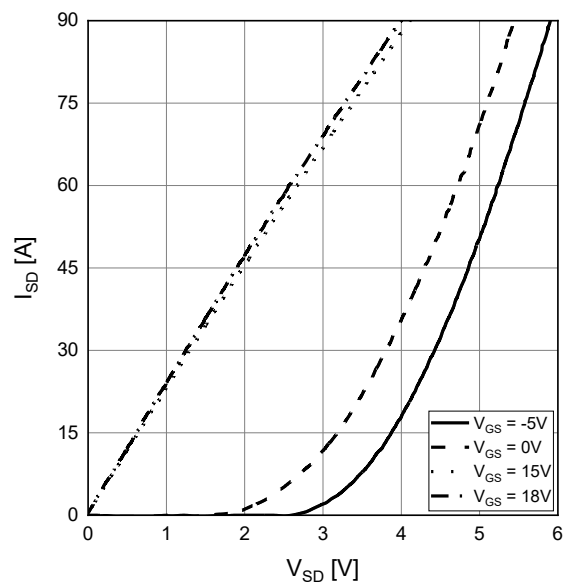
**Typical reverse drain current characteristics**

$I_{SD} = f(V_{SD}), T_J = 25^\circ\text{C}$



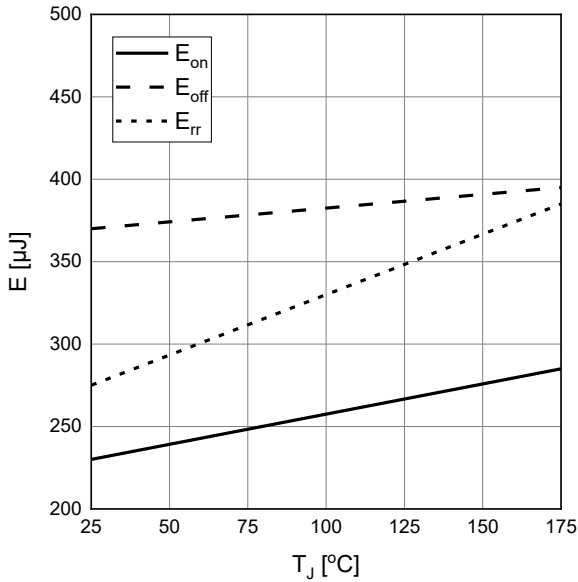
**Typical reverse drain current characteristics**

$I_{SD} = f(V_{SD}), T_J = 175^\circ\text{C}$



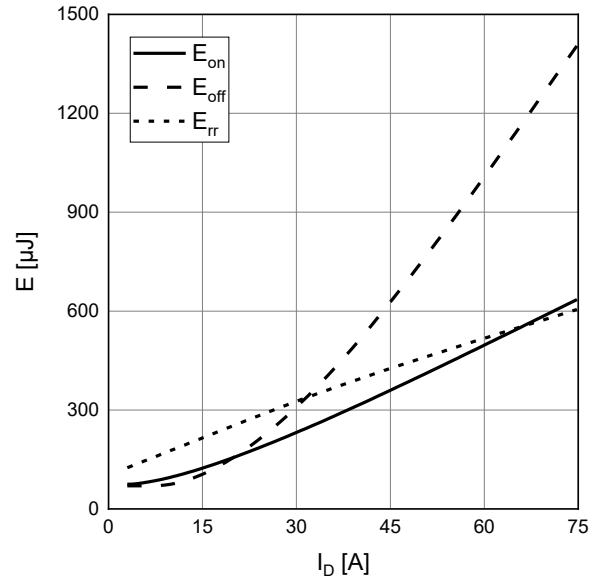
**Typical switching losses vs junction temperature**

$E = f(T_J), V_{GS} = 0/18\text{ V}, I_D = 37.4\text{ A}, R_{G,ext} = 5\ \Omega, V_{DS} = 800\text{ V}$



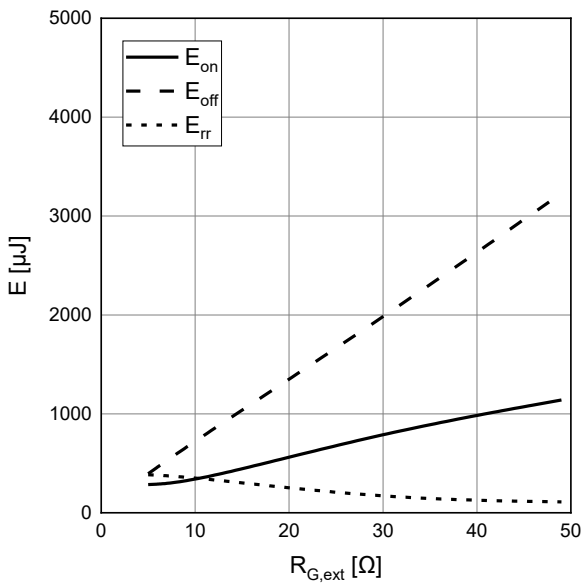
**Typical switching losses vs drain current**

$E = f(I_D), V_{GS} = 0/18\text{ V}, T_J = 175^\circ\text{C}, R_{G,ext} = 5\ \Omega, V_{DS} = 800\text{ V}$



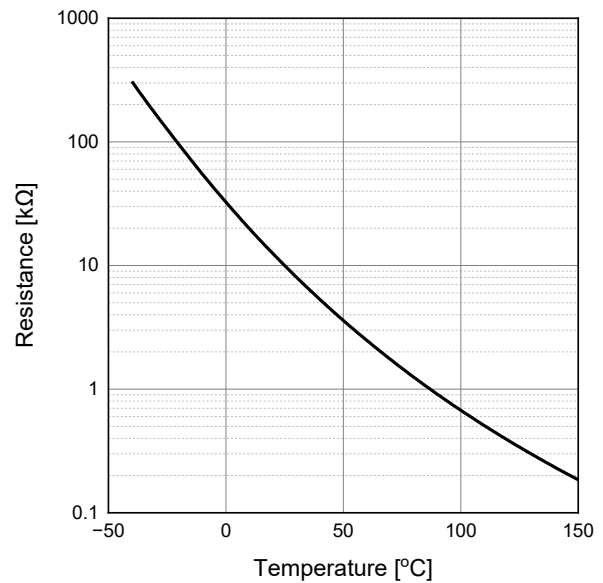
**Typical switching losses vs gate resistance**

$E = f(R_{G,ext}), V_{GS} = 0/18\text{ V}, T_J = 175^\circ\text{C}, I_D = 37.4\text{ A}, V_{DS} = 800\text{ V}$



**NTC thermistor characteristics**

$R = f(T_{NTC})$



## 6 Pin description

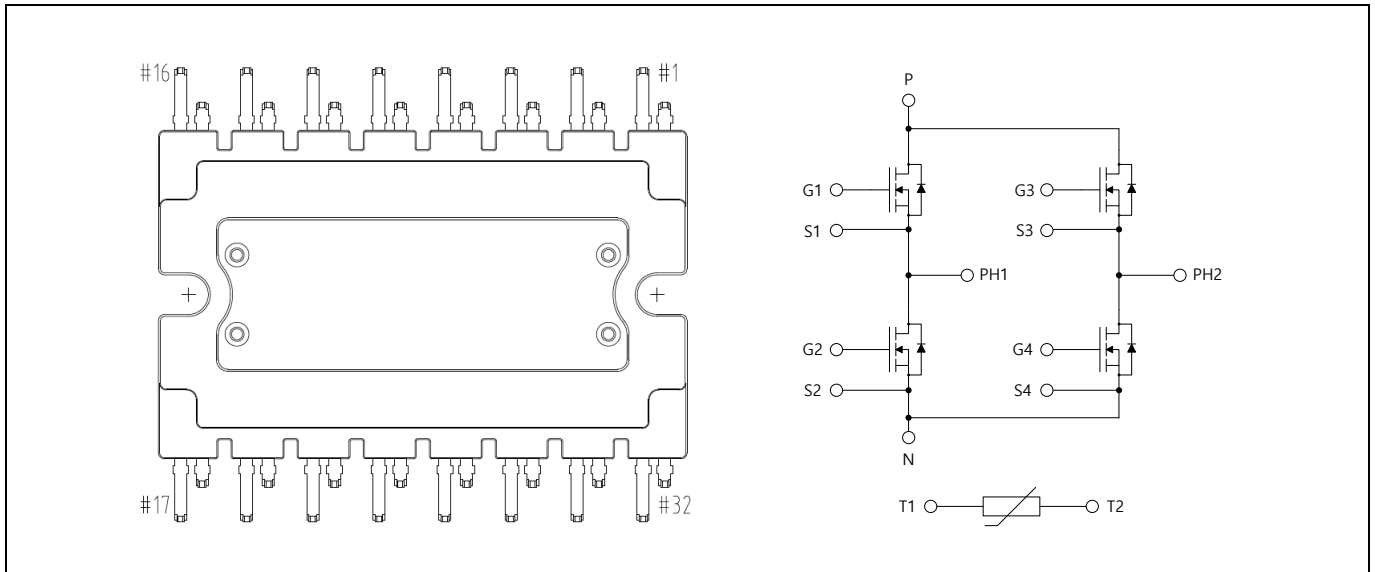


Figure 1 Pin-out (bottom view)

Table 9 Pin description

Pin number	Description	Pin number	Description
1	N	17	NC
2	N	18	NC
3	NC	19	G3
4	NC	20	S3
5	PH1	21	G4
6	PH1	22	S4
7	NC	23	NC
8	NC	24	NC
9	PH2	25	NC
10	PH2	26	NC
11	NC	27	S1
12	NC	28	G1
13	T2	29	S2
14	T1	30	G2
15	P	31	NC
16	P	32	NC

## 7 Package outline

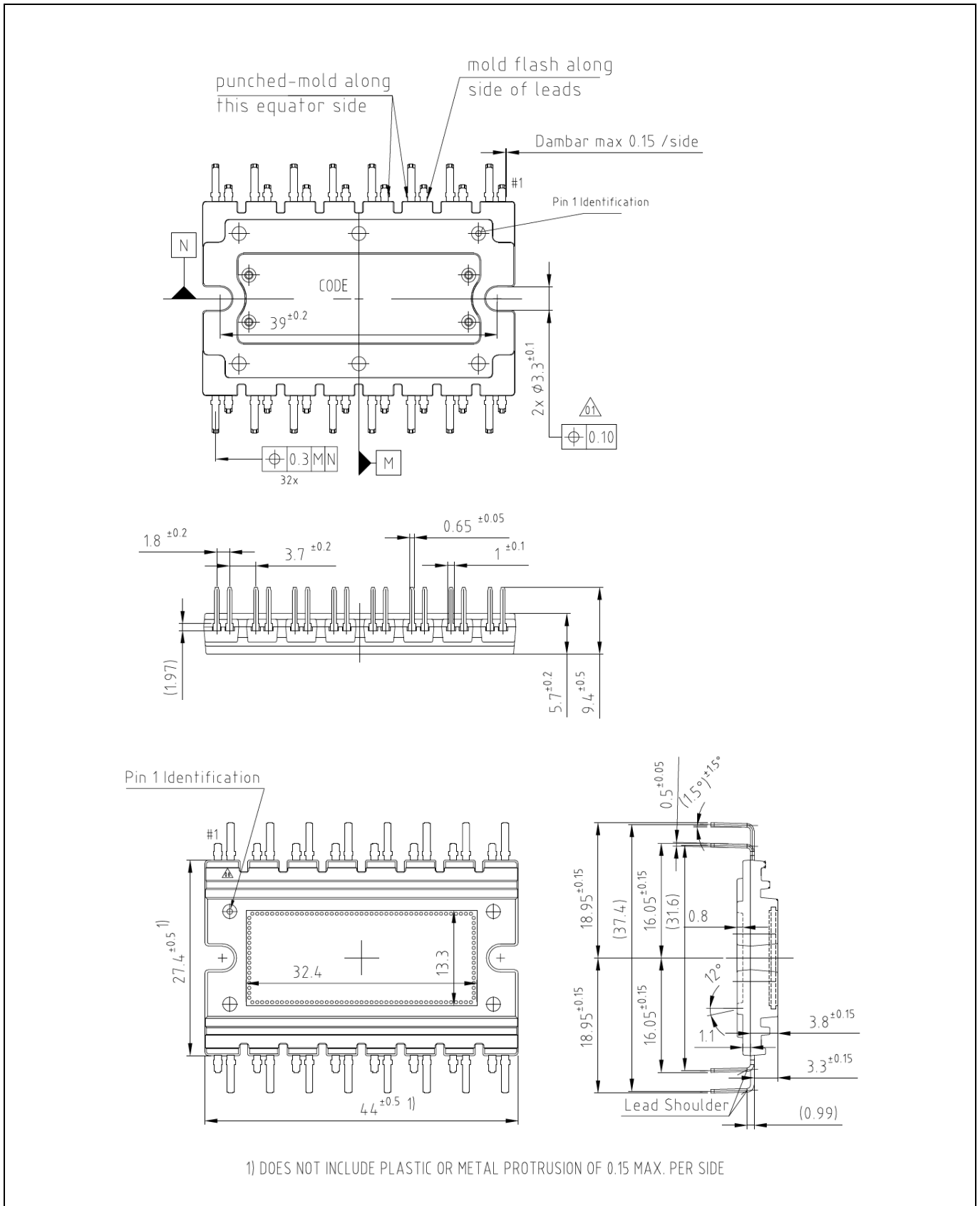


Figure 2 AMF12S18LB2Z



**Revision history**

<b>Document version</b>	<b>Date of release</b>	<b>Description of changes</b>
2.0	2026-01-30	Initial release

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