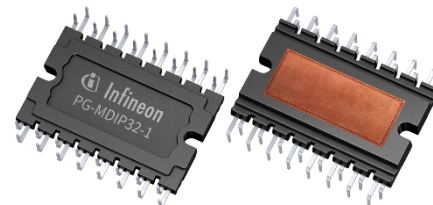


## CIPOS™ Prime

### AMM12S18LB1Z

#### Features

- 1200 V SiC MOSFET 6-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 six 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	
AMM12S18LB1Z	DIP 44x28DA	11 pcs / Tube	176 pcs	SP006043202



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# 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 $T_{J,max}$	$I_D$	$V_{GS} = 18\text{ V}, T_C = 25^\circ\text{C}$	85	A
		$V_{GS} = 18\text{ V}, T_C = 100^\circ\text{C}$	60	
Peak drain current, $t_p$ limited by $T_{J,max}$	$I_{DM}$	$V_{GS} = 18\text{ V}$	180	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	$P_D$		312	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	$g_{fs}$	$I_D = 37.4\text{ A}, V_{DS} = 00\text{ V}$		17.6		S

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	$R_{th(j-c)}$				0.48	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

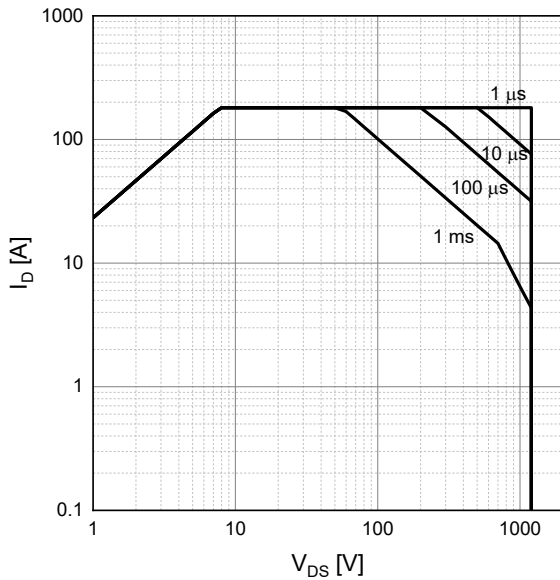
**Table 8** Characteristic values

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

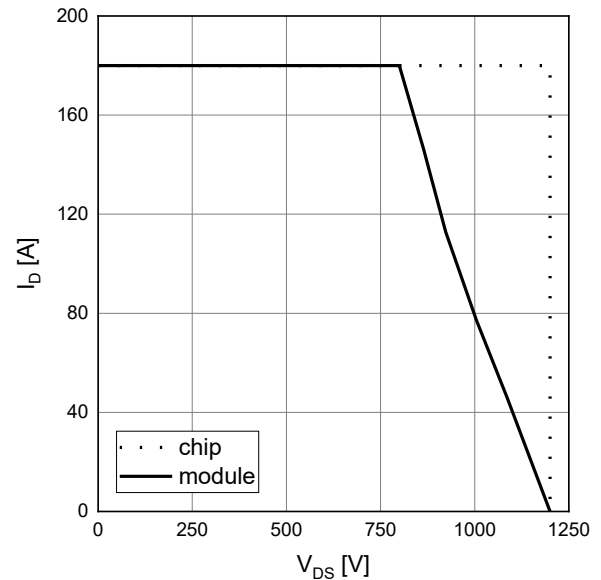
### Forward bias safe operating area (FBSOA)

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



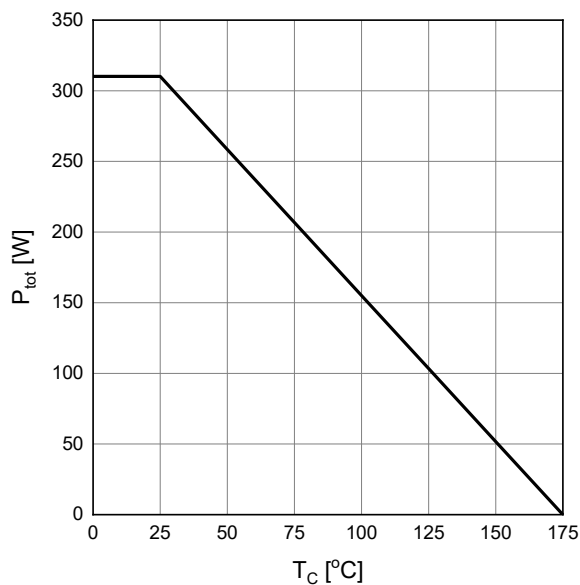
### Reverse bias safe operating area (RBSOA)

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



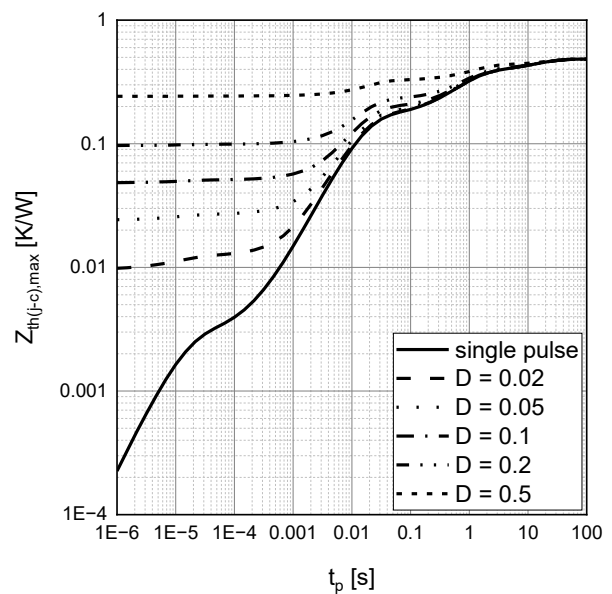
### Power dissipation

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



### Max. transient thermal impedance

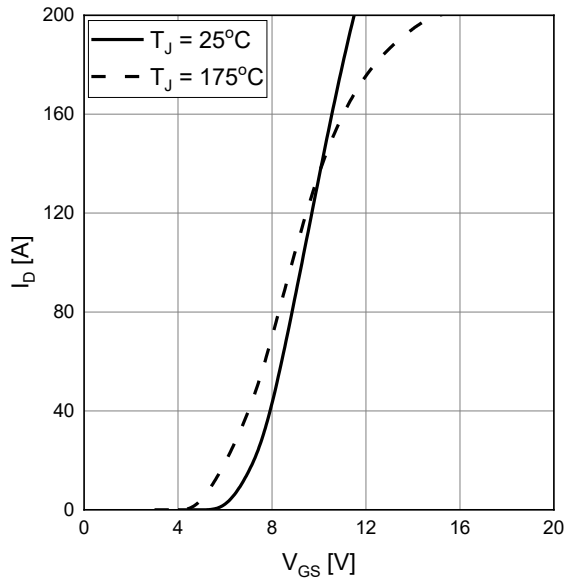
$$Z_{\text{th}(j-c),\text{max}} = f(t_p), D = t_p/T$$



Characteristics diagrams

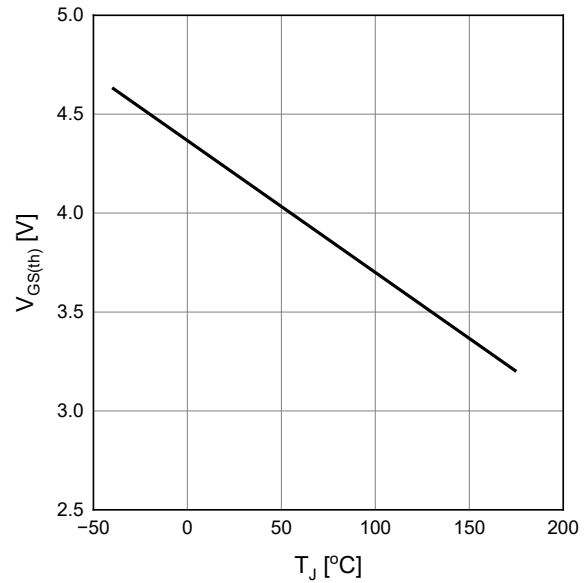
**Typical transfer characteristics**

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



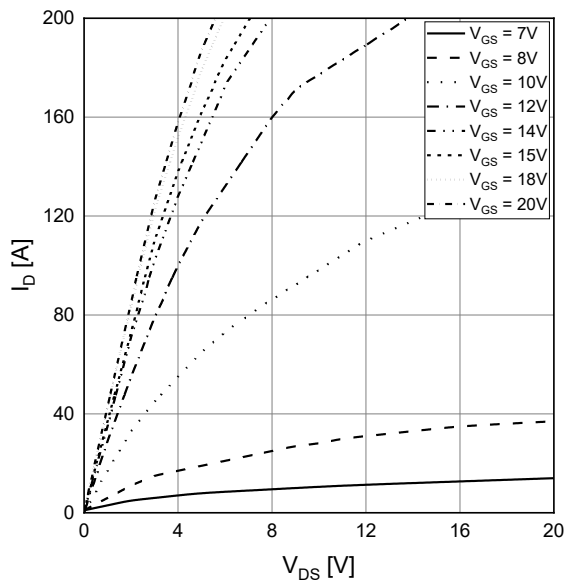
**Typical gate-source threshold voltage vs junction temperature**

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



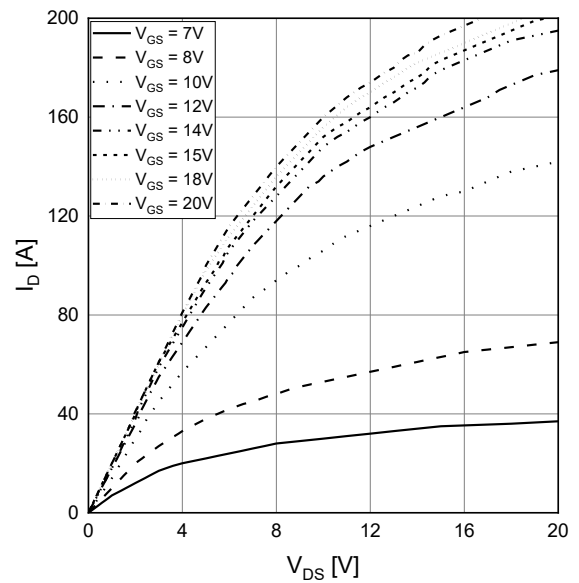
**Typical output characteristics**

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



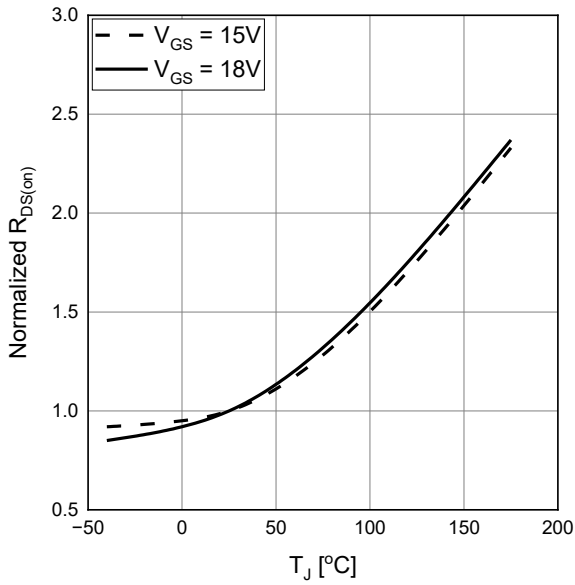
**Typical output characteristics**

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



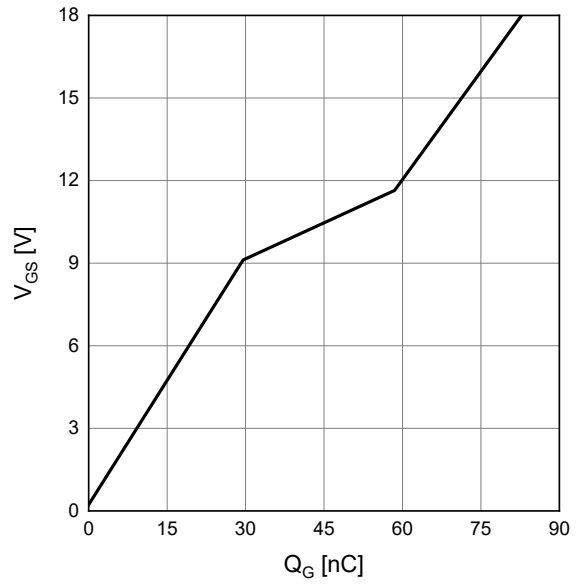
**Typical on-state resistance vs junction temperature**

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



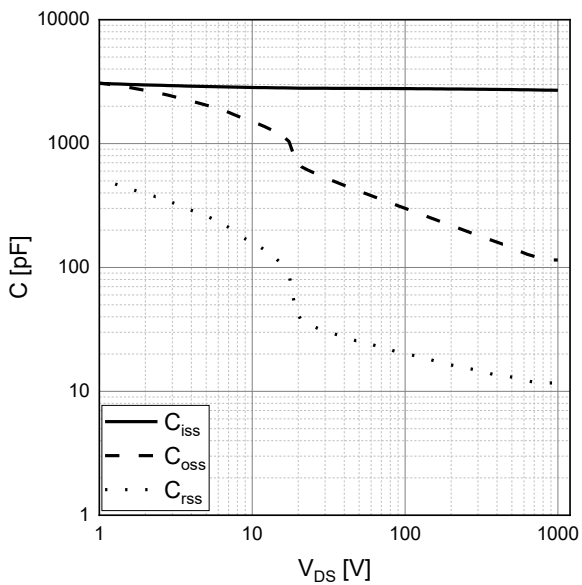
**Typical gate charge**

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



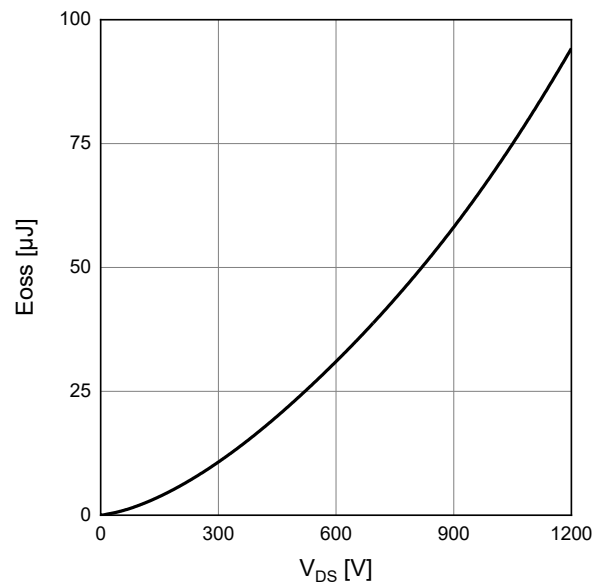
**Typical capacitance vs drain-source voltage**

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



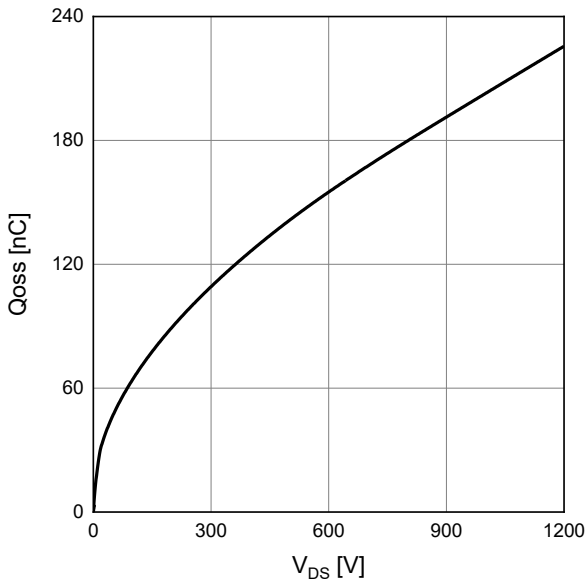
**Typical Coss stored energy**

$E = f(V_{DS})$



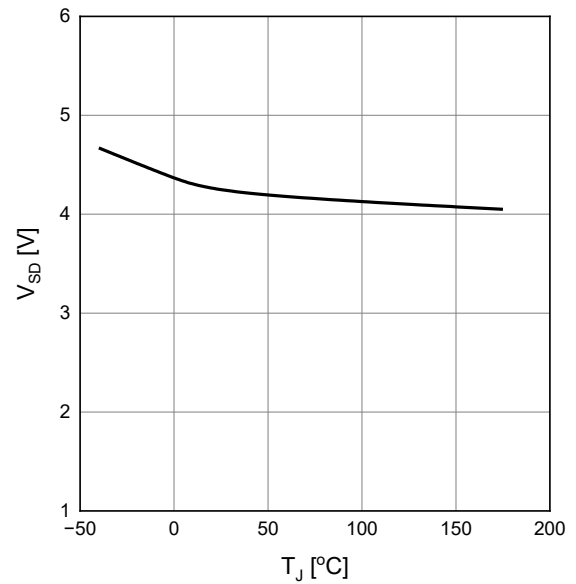
**Typical Coss stored charge**

$Q = f(V_{DS})$



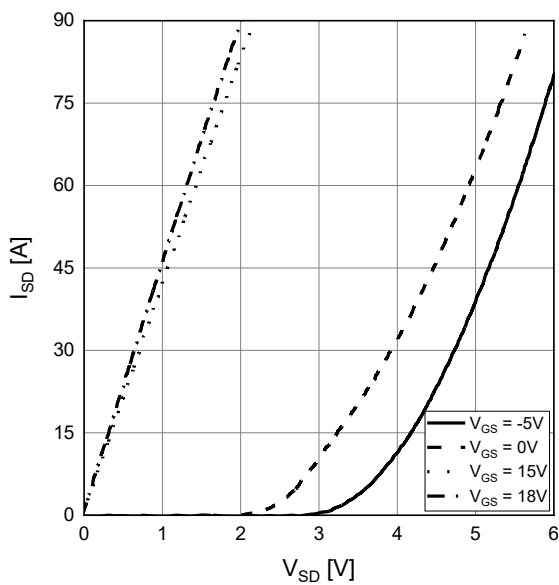
**Typical reverse drain voltage characteristics**

$V_{SD} = f(T_J), I_{SD} = 37.4 \text{ A}, V_{GS} = 0 \text{ V}$



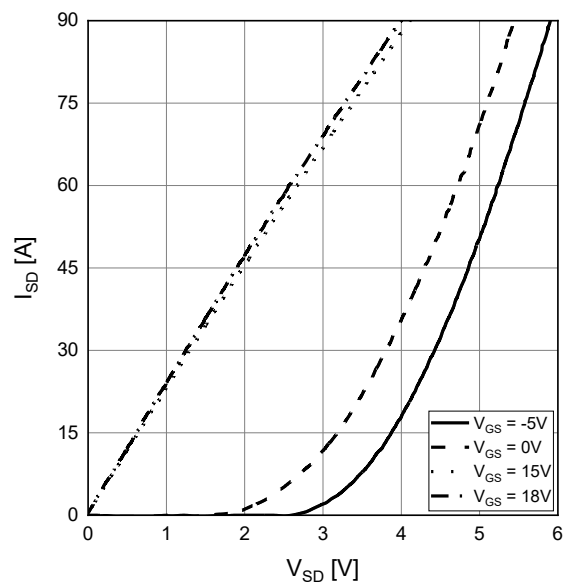
**Typical reverse drain current characteristics**

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



**Typical reverse drain current characteristics**

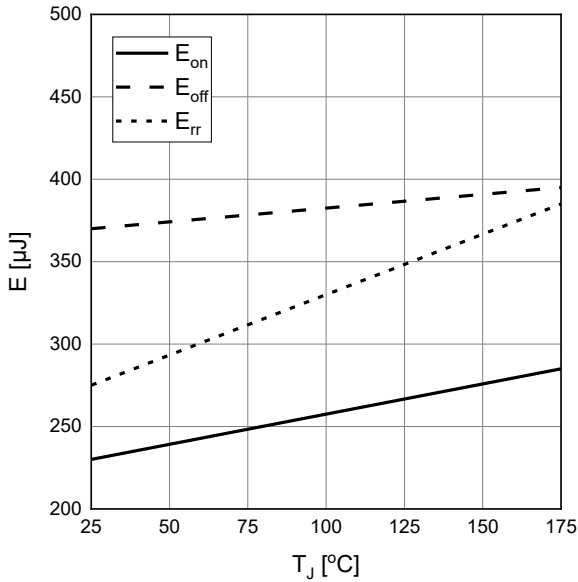
$I_{SD} = f(V_{SD}), T_J = 175^\circ\text{C}$



Characteristics diagrams

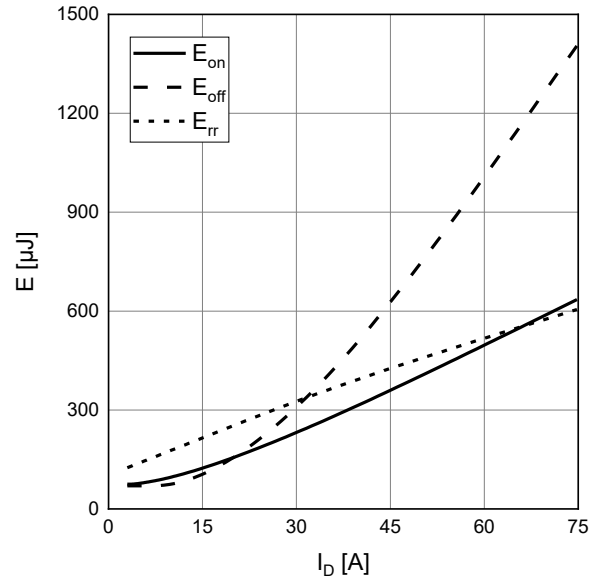
**Typical switching losses vs junction temperature**

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



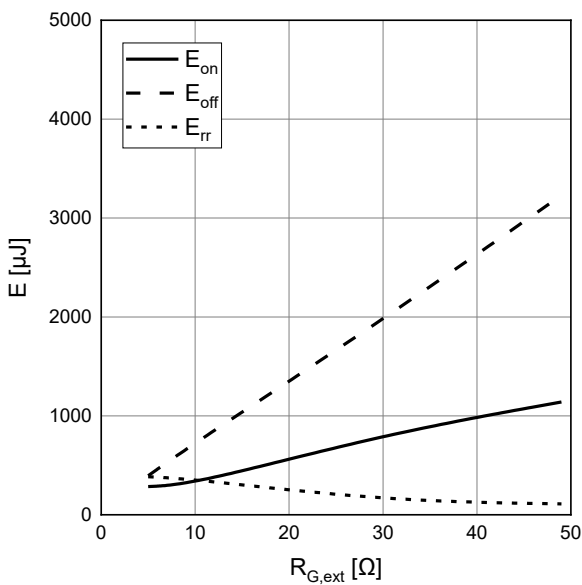
**Typical switching losses vs drain current**

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



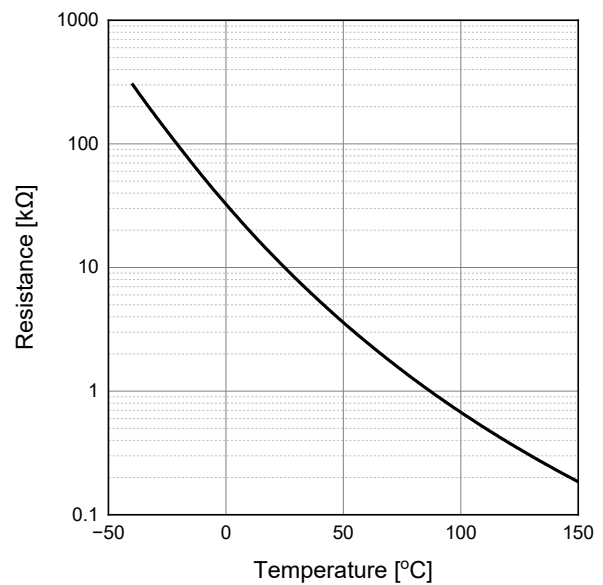
**Typical switching losses vs gate resistance**

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



**NTC thermistor characteristics**

$R = f(T_{NTC})$



## 6 Pin description

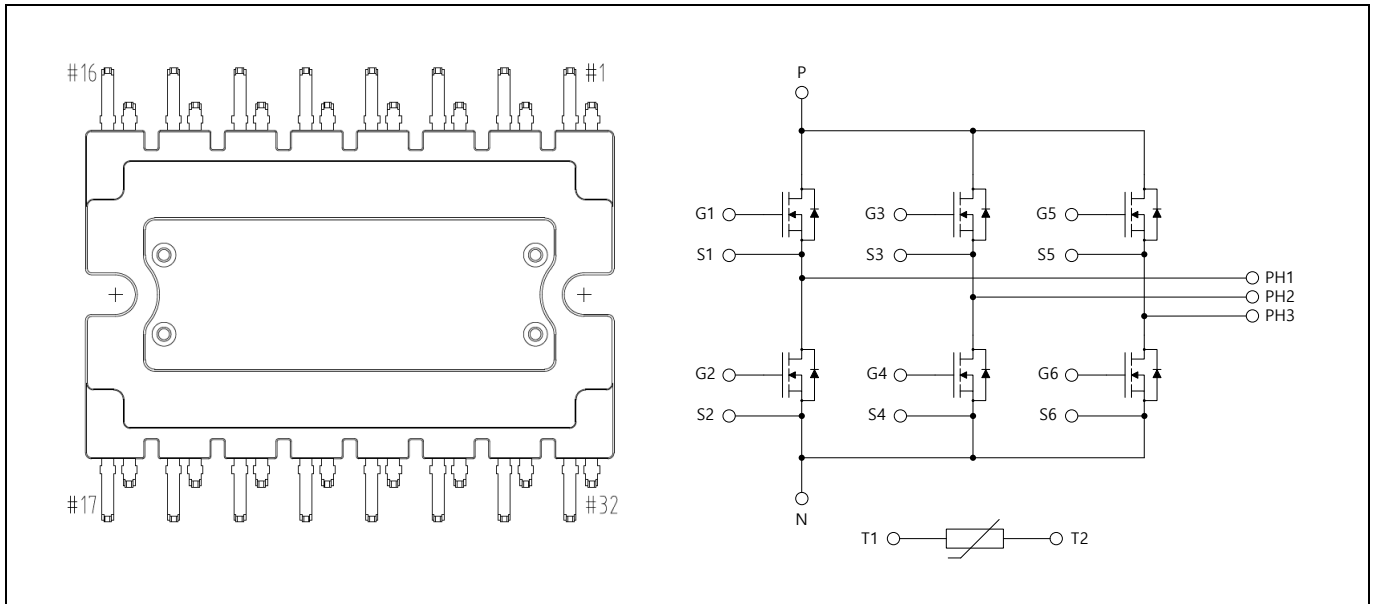


Figure 1 Pin-out (bottom view)

Table 9 Pin description

Pin number	Description	Pin number	Description
1	N	17	P
2	N	18	P
3	NC	19	G1
4	NC	20	S1
5	PH3	21	G2
6	PH3	22	S2
7	NC	23	G3
8	NC	24	S3
9	PH2	25	G4
10	PH2	26	S4
11	NC	27	G5
12	NC	28	S5
13	PH1	29	G6
14	PH1	30	S6
15	T2	31	NC
16	T1	32	NC

## 7 Package outline

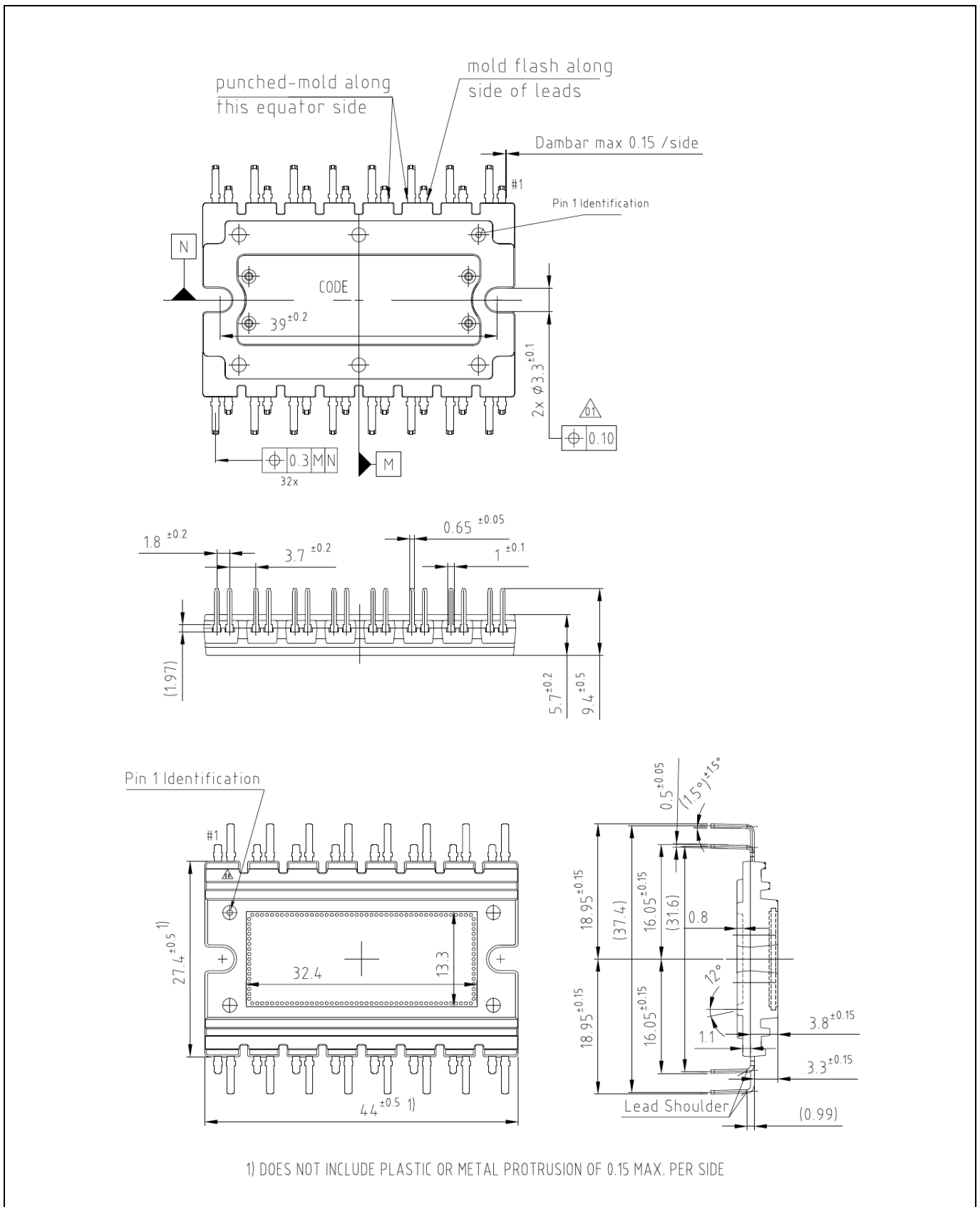


Figure 2 AMM12S18LB1Z



**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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**Email: [erratum@infineon.com](mailto:erratum@infineon.com)**

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