

## MOSFET

### 600V CoolMOS™ CM8 Power Transistor

Built on Infineon's world-class super-junction MOSFET platform with an integrated fast body diode, making it suitable for a wide range of applications. It enables highest power density at lowest possible system cost with superior reliability. It is enhancing Infineon's WBG offering and the successor of the 600 V CoolMOS™ 7 MOSFET family.

### Features

- Best-In-Class SJ Mosfet Performance
- Address broad hard and soft switching applications with outstanding commutation ruggedness
- Integrated fast body diode and ESD protection
- .XT interconnection technology for best-in-class thermal performance

### Benefits

- Provides the best price performance ratio with Best-In-Class SJ Mosfet Performance
- Ease of use and shorter design in cycle
- Enable multiple topologies
- 14-42% lower  $R_{th}$  for improved thermal performance

### Potential applications

- Datacenter, AI server, Telecom Power Supply
- Micro and Residential Hybrid Inverter
- Portable and Residential Energy Storage, UPS
- EV Charging, Light electric vehicles, Electric Forklift
- High Voltage Solid State Power Distribution
- Home & Professional Tools
- Charger, Adapters, TV and Console SMPS

### Product validation

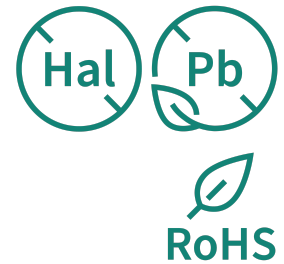
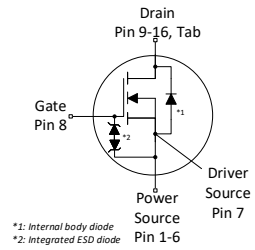
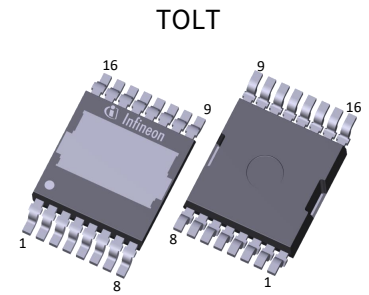
Qualified according to relevant JEDEC tests.

*Please note: For MOSFET paralleling the use of ferrite beads on the gate or separate totem poles is generally recommended.*

**Table 1 Key performance parameters**

Parameter	Value	Unit
$V_{DS} @ T_{j,max}$	650	V
$R_{DS(on),max}$	180	mΩ
$Q_{g,typ}$	17	nC
$I_{D,pulse}$	48	A
$E_{oss} @ 400 V$	2.4	μJ
Body diode $di_F/dt$	1300	A/μs
ESD class (HBM)	2	

Part number	Package	Marking	Related links
IPLT60R180CM8	PG-HDSOP-16	60R180C8	see Appendix A





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## 1 Maximum ratings

at  $T_j = 25^\circ\text{C}$ , unless otherwise specified

**Table 2 Maximum ratings**

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Continuous drain current <sup>1)</sup>	$I_D$	-	-	18	A	$T_C = 25^\circ\text{C}$
Continuous drain current	$I_D$	-	-	11	A	$T_C = 100^\circ\text{C}$
Pulsed drain current <sup>2)</sup>	$I_{D,pulse}$	-	-	48	A	$T_C = 25^\circ\text{C}$
Avalanche energy, single pulse	$E_{AS}$	-	-	28	mJ	$I_D = 2.7\text{ A}; V_{DD} = 50\text{ V};$ see table 10
Avalanche energy, repetitive	$E_{AR}$	-	-	0.14		
Avalanche current, single pulse	$I_{AS}$	-	-	2.7	A	-
MOSFET dv/dt ruggedness	dv/dt	-	-	120	V/ns	$V_{DS} = 0\dots 400\text{ V}$
Gate source voltage (static)	$V_{GS}$	-20	-	20	V	static;
Gate source voltage (dynamic)	$V_{GS}$	-30	-	30	V	AC ( $f > 1\text{ Hz}$ )
Power dissipation	$P_{tot}$	-	-	119	W	$T_C = 25^\circ\text{C}$
Storage temperature	$T_{stg}$	-55	-	150	$^\circ\text{C}$	-
Operating junction temperature	$T_j$					
Extended operating junction temperature	$T_j$	150	-	175	$^\circ\text{C}$	$\leq 50\text{ h}$ in the application lifetime
Mounting torque	-	-	-	-	Ncm	-
Continuous diode forward current	$I_S$	-	-	18	A	$T_C = 25^\circ\text{C}$
Diode pulse current <sup>2)</sup>	$I_{S,pulse}$			48		
Reverse diode dv/dt <sup>3)</sup>	dv/dt	-	-	70	V/ns	$V_{DS} = 0\dots 400\text{ V}, I_{SD} \leq 18\text{ A}, T_j = 25^\circ\text{C}$ see table 8
Maximum diode commutation speed	$di_F/dt$			1300		
Insulation withstand voltage	$V_{ISO}$	-	-	n.a.	V	$V_{rms}, T_C = 25^\circ\text{C}, t = 1\text{ min}$

<sup>1)</sup> Limited by  $T_{j,max}$ .

<sup>2)</sup> Pulse width  $t_p$  limited by  $T_{j,max}$ .

<sup>3)</sup> Identical low side and high side switch with identical  $R_G$ .

## 2 Thermal characteristics

**Table 3 Thermal characteristics**

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case	$R_{thJC}$	-	-	1.05	K/W	-
Thermal resistance, junction - ambient	$R_{thJA}$	-	-	62	K/W	device on PCB, minimal footprint
Thermal resistance, junction - ambient for SMD version	$R_{thJA}$	-	45	55	K/W	Device on 40 mm*40 mm*1.5 mm epoxy PCB FR4 with 6 cm <sup>2</sup> (one layer, 70 μm thickness) copper area for drain connection and cooling. PCB is vertical without air stream cooling.
Soldering temperature, wave- & reflow soldering allowed	$T_{sold}$	-	-	260	°C	reflow MSL1

### 3 Electrical characteristics

at  $T_j = 25^\circ\text{C}$ , unless otherwise specified

**Table 4 Static characteristics**

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Drain-source breakdown voltage	$V_{(BR)DSS}$	600	-	-	V	$V_{GS} = 0\text{ V}, I_D = 1\text{ mA}$
Gate threshold voltage	$V_{(GS)th}$	3.7	4.2	4.7	V	$V_{DS} = V_{GS}, I_D = 0.14\text{ mA}$
Zero gate voltage drain current	$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS} = 600\text{ V}, V_{GS} = 0\text{ V}, T_j = 25^\circ\text{C}$
			20.8	-		$V_{DS} = 600\text{ V}, V_{GS} = 0\text{ V}, T_j = 150^\circ\text{C}$
Gate-source leakage current	$I_{GSS}$	-	-	1.6	$\mu\text{A}$	$V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$
Drain-source on-state resistance	$R_{DS(on)}$	-	0.150	0.180	$\Omega$	$V_{GS} = 10\text{ V}, I_D = 5.6\text{ A}, T_j = 25^\circ\text{C}$
			0.331	-		$V_{GS} = 10\text{ V}, I_D = 5.6\text{ A}, T_j = 150^\circ\text{C}$
Gate resistance	$R_G$	-	12	-	$\Omega$	$f = 1\text{ MHz}$

**Table 5 Dynamic characteristics**

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Input capacitance	$C_{iss}$	-	743	-	$\text{pF}$	$V_{GS} = 0\text{ V}, V_{DS} = 400\text{ V}, f = 250\text{ kHz}$
Output capacitance	$C_{oss}$	-	11	-		
Effective output capacitance, energy related <sup>4)</sup>	$C_{o(er)}$	-	30	-	$\text{pF}$	$V_{GS} = 0\text{ V}, V_{DS} = 0\dots 400\text{ V}$
Effective output capacitance, time related <sup>5)</sup>	$C_{o(tr)}$	-	301	-	$\text{pF}$	$I_D = \text{constant}, V_{GS} = 0\text{ V}, V_{DS} = 0\dots 400\text{ V}$
Turn-on delay time	$t_{d(on)}$	-	17	-	$\text{ns}$	$V_{DD} = 400\text{ V}, V_{GS} = 13\text{ V}, I_D = 2.8\text{ A}, R_G = 10.0\ \Omega$ ; see table 9
Rise time	$t_r$		6			
Turn-off delay time	$t_{d(off)}$		88			
Fall time	$t_f$		13			

<sup>4)</sup>  $C_{o(er)}$  is a fixed capacitance that gives the same stored energy as  $C_{oss}$  while  $V_{DS}$  is rising from 0 to 400 V

<sup>5)</sup>  $C_{o(tr)}$  is a fixed capacitance that gives the same charging time as  $C_{oss}$  while  $V_{DS}$  is rising from 0 to 400V

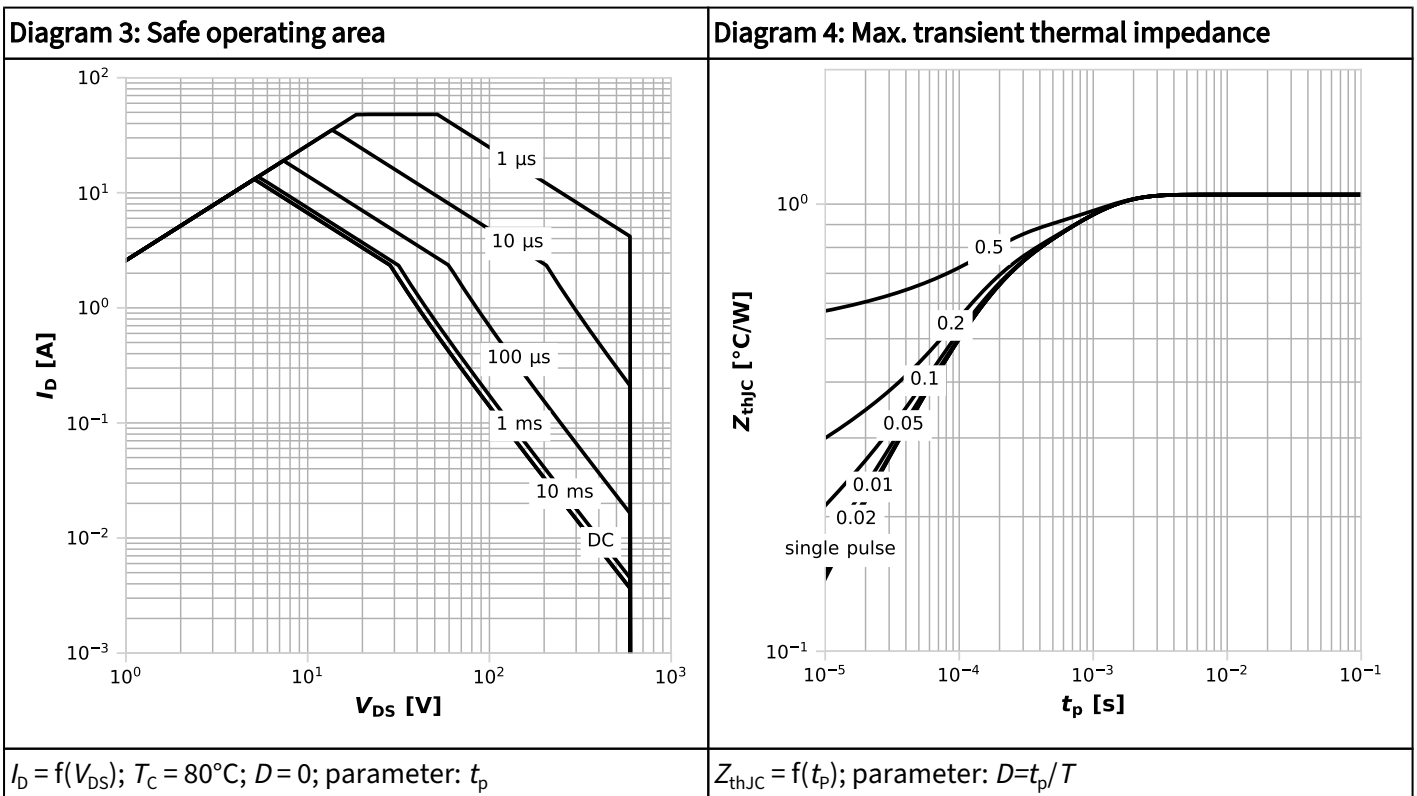
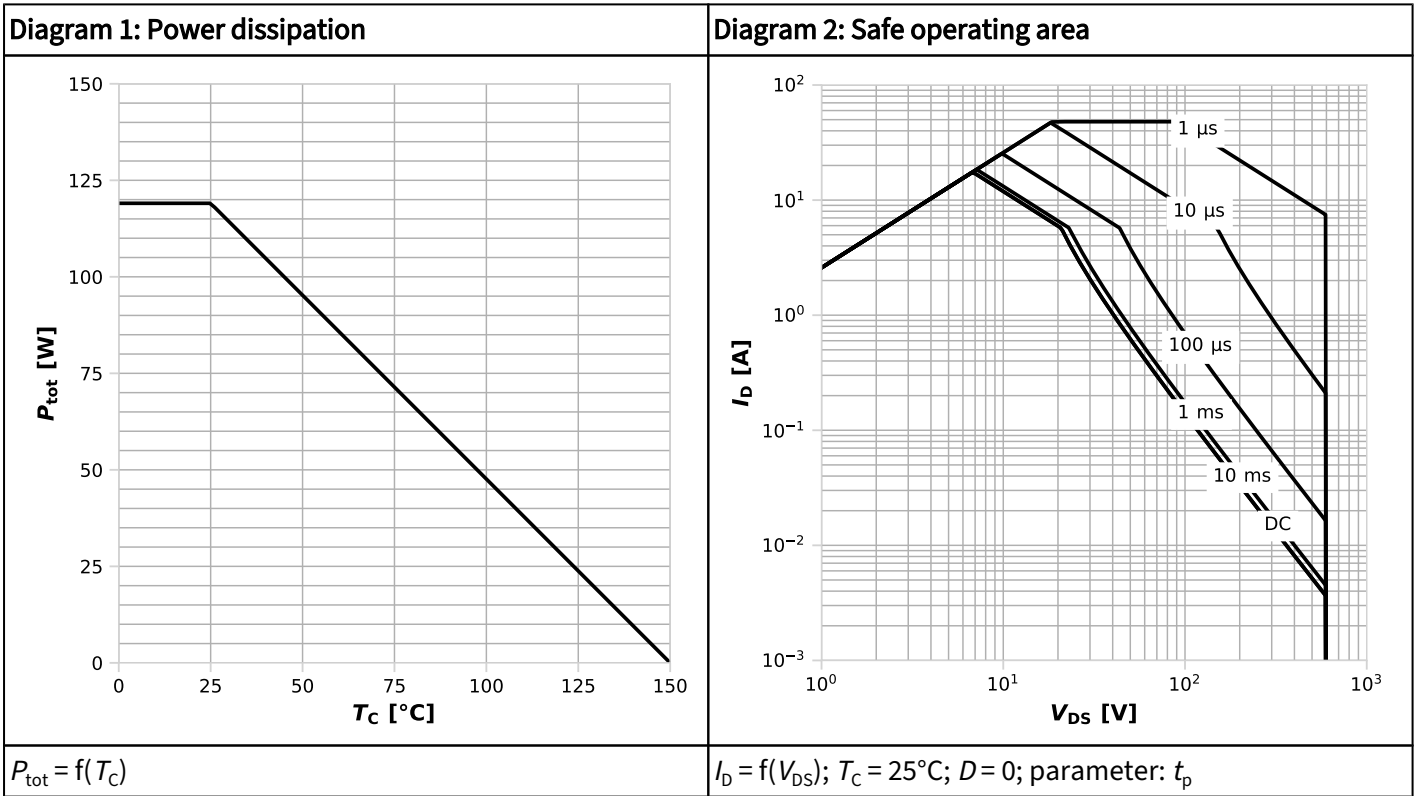
**Table 6 Gate charge characteristics**

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Gate to source charge	$Q_{gs}$	-	5	-	$\text{nC}$	$V_{DD} = 400\text{ V}, I_D = 2.8\text{ A}, V_{GS} = 0\text{ to }10\text{ V}$
Gate to drain charge	$Q_{gd}$		7			
Gate charge total	$Q_g$		17			
Gate plateau voltage	$V_{plateau}$		6.1			

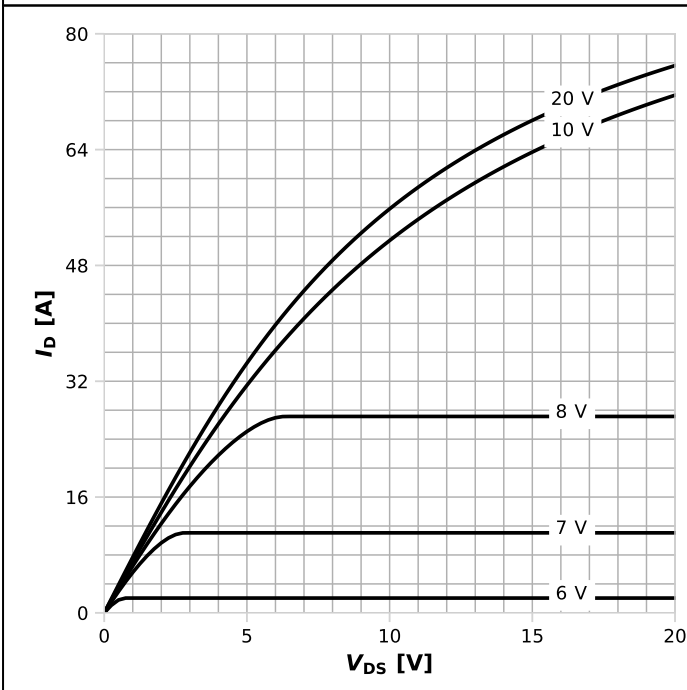
**Table 7 Reverse diode characteristics**

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Diode forward voltage	$V_{SD}$	-	0.9	-	V	$V_{GS} = 0\text{ V}$ , $I_F = 2.8\text{ A}$ , $T_j = 25^\circ\text{C}$
Reverse recovery time	$t_{rr}$	-	62	77	ns	$V_R = 400\text{ V}$ , $I_F = 2.8\text{ A}$ , $di_F/dt = 100\text{ A}/\mu\text{s}$ ; see table 8
Reverse recovery charge	$Q_{rr}$		0.18	0.27	$\mu\text{C}$	
Peak reverse recovery current	$I_{rrm}$		6.0	-	A	

## 4 Electrical characteristics diagrams

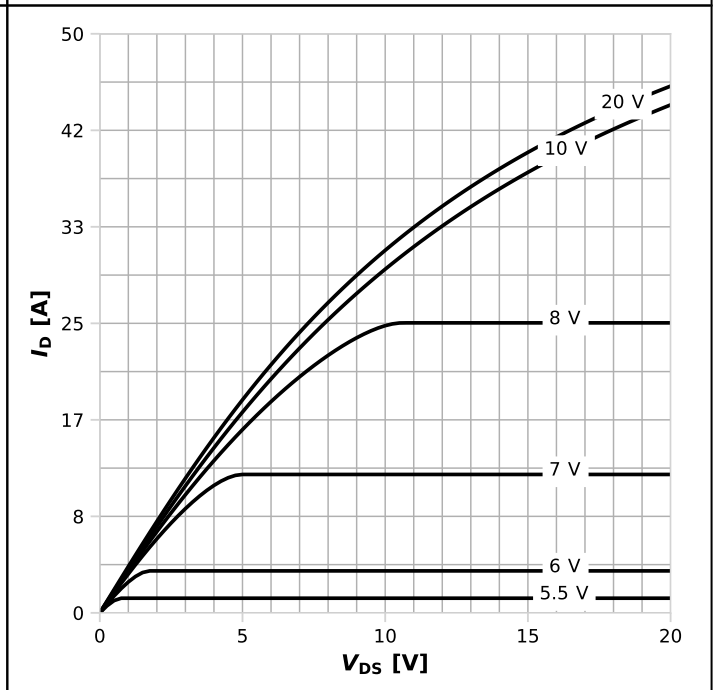


**Diagram 5: Typ. output characteristics**



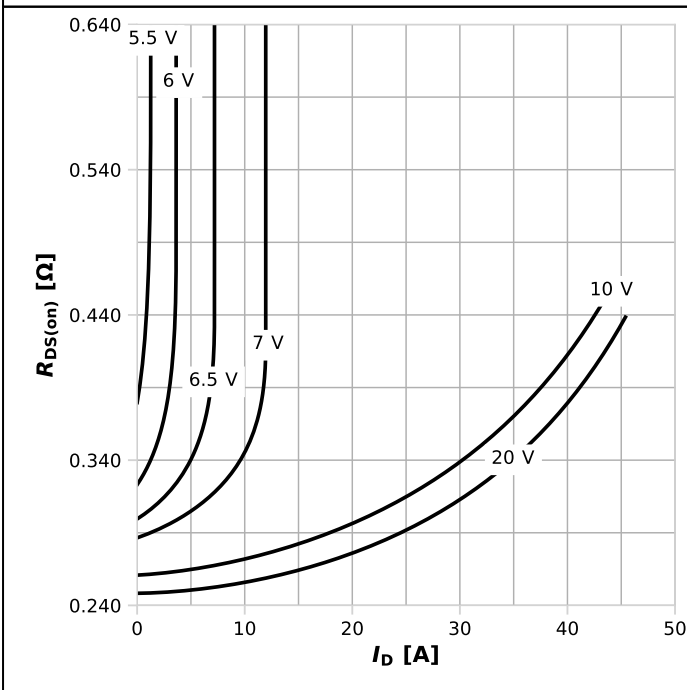
$I_D = f(V_{DS}); T_j = 25^\circ\text{C}; \text{parameter: } V_{GS}$

**Diagram 6: Typ. output characteristics**



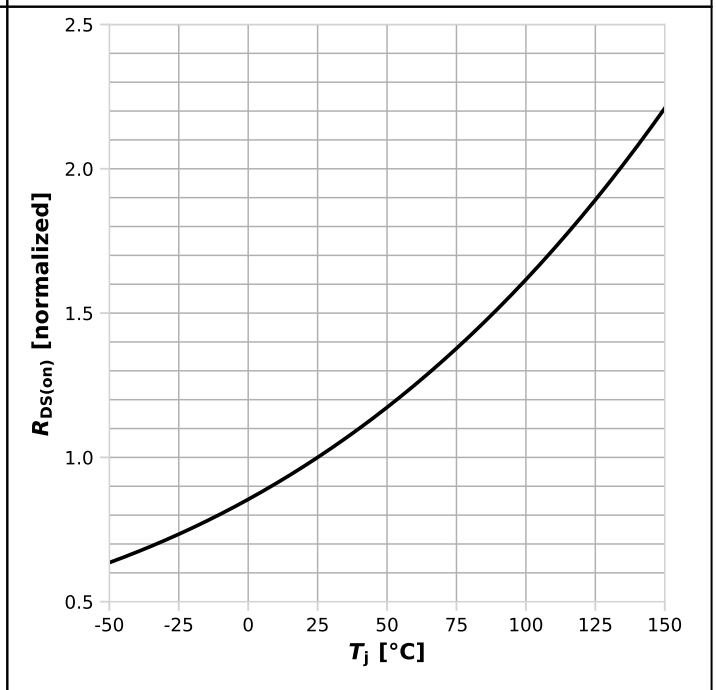
$I_D = f(V_{DS}); T_j = 125^\circ\text{C}; \text{parameter: } V_{GS}$

**Diagram 7: Typ. drain-source on-state resistance**



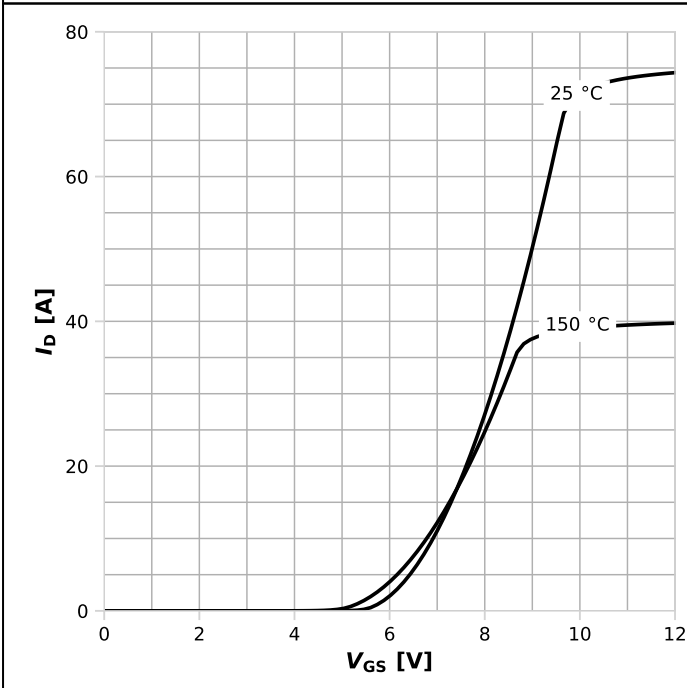
$R_{DS(on)} = f(I_D); T_j = 125^\circ\text{C}; \text{parameter: } V_{GS}$

**Diagram 8: Drain-source on-state resistance**



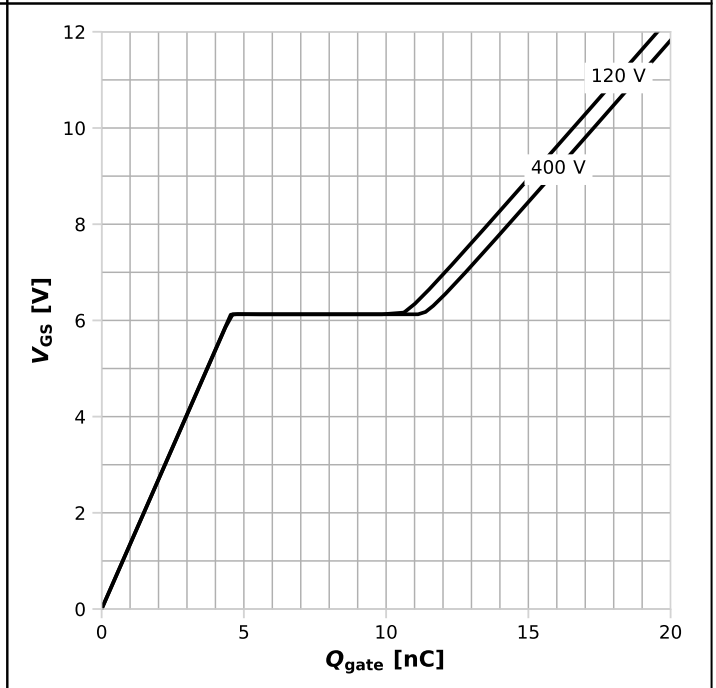
$R_{DS(on)} = f(T_j); I_D = 5.6 \text{ A}; V_{GS} = 10 \text{ V}$

**Diagram 9: Typ. transfer characteristics**



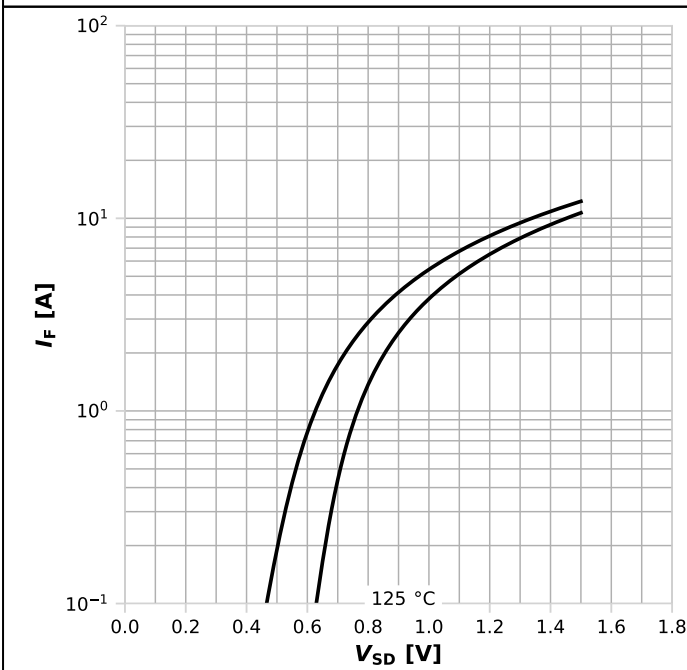
$I_D = f(V_{GS}); V_{DS} = 20 \text{ V}; \text{parameter: } T_j$

**Diagram 10: Typ. gate charge**



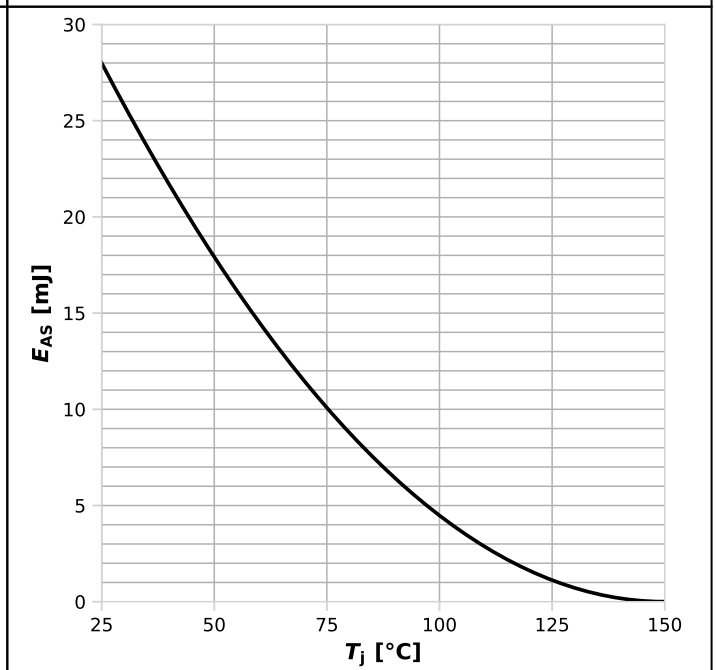
$V_{GS} = f(Q_{\text{gate}}); I_D = 2.8 \text{ A pulsed}; \text{parameter: } V_{DD}$

**Diagram 11: Forward characteristics of reverse diode**



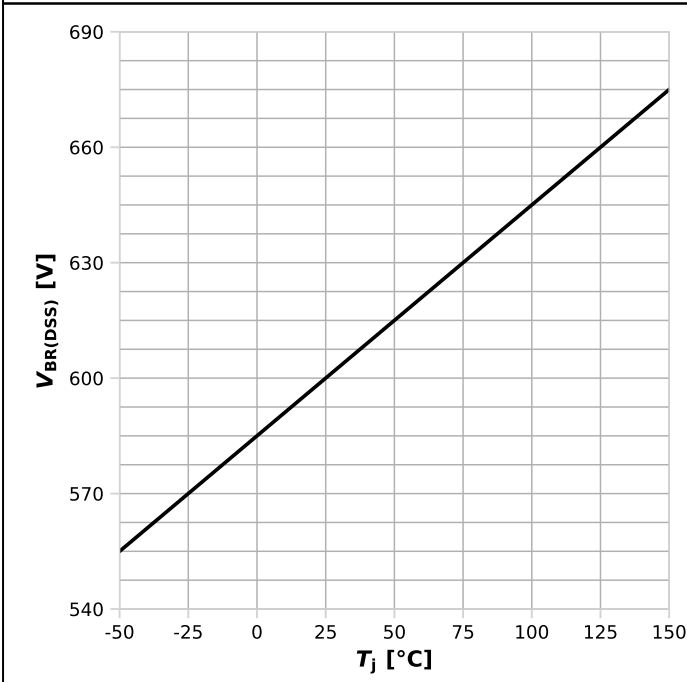
$I_F = f(V_{SD}); \text{parameter: } T_j$

**Diagram 12: Avalanche energy**



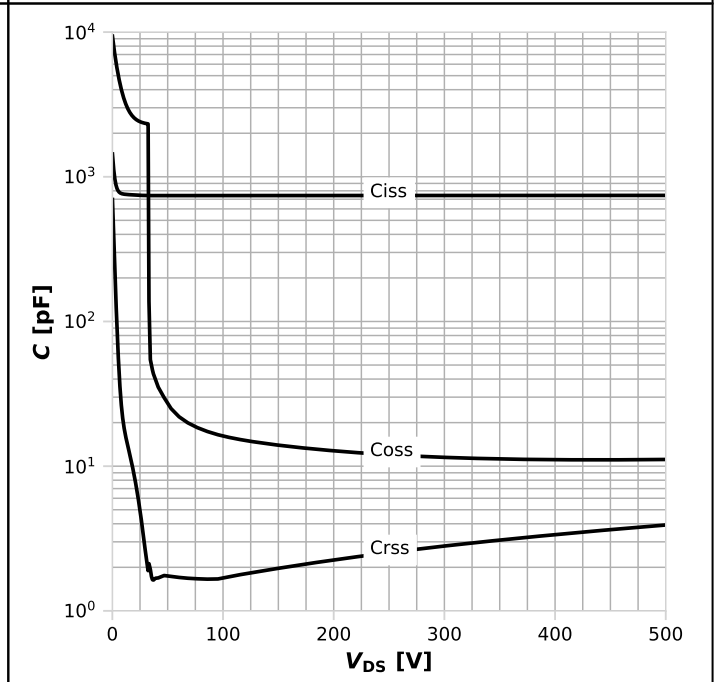
$E_{AS} = f(T_j); I_D = 2.7 \text{ A}; V_{DD} = 50 \text{ V}$

**Diagram 13: Drain-source breakdown voltage**



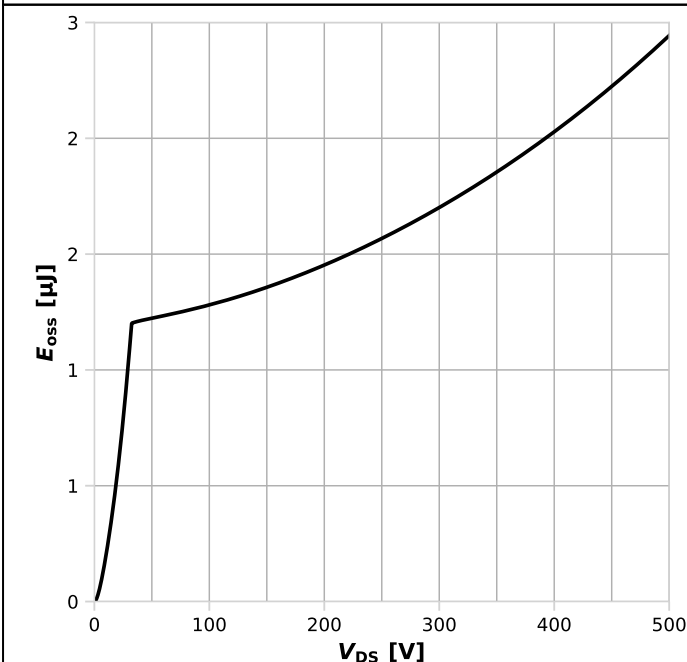
$V_{BR(DSS)} = f(T_j); I_D = 1 \text{ mA}$

**Diagram 14: Typ. capacitances**



$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 250 \text{ kHz}$

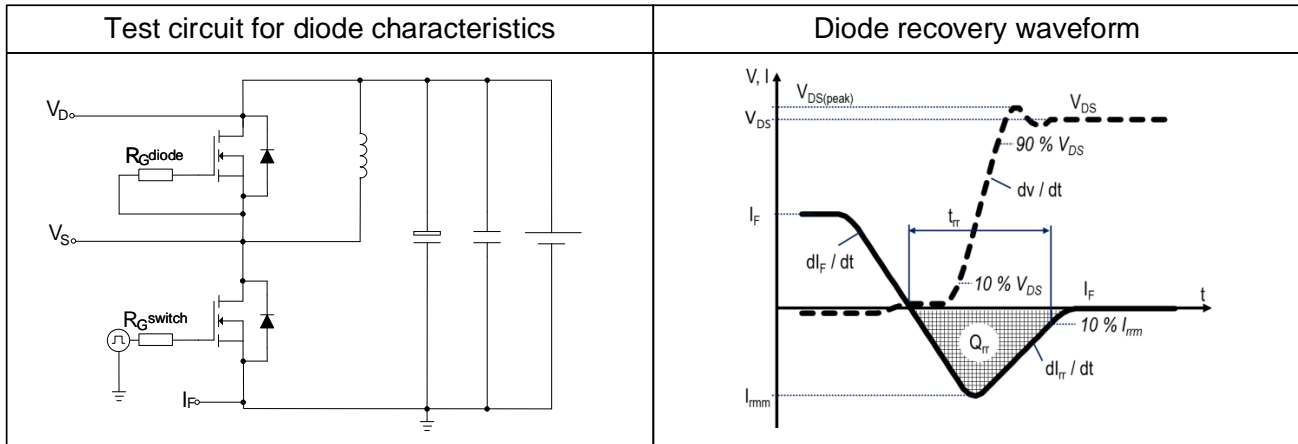
**Diagram 15: Typ. Coss stored energy**



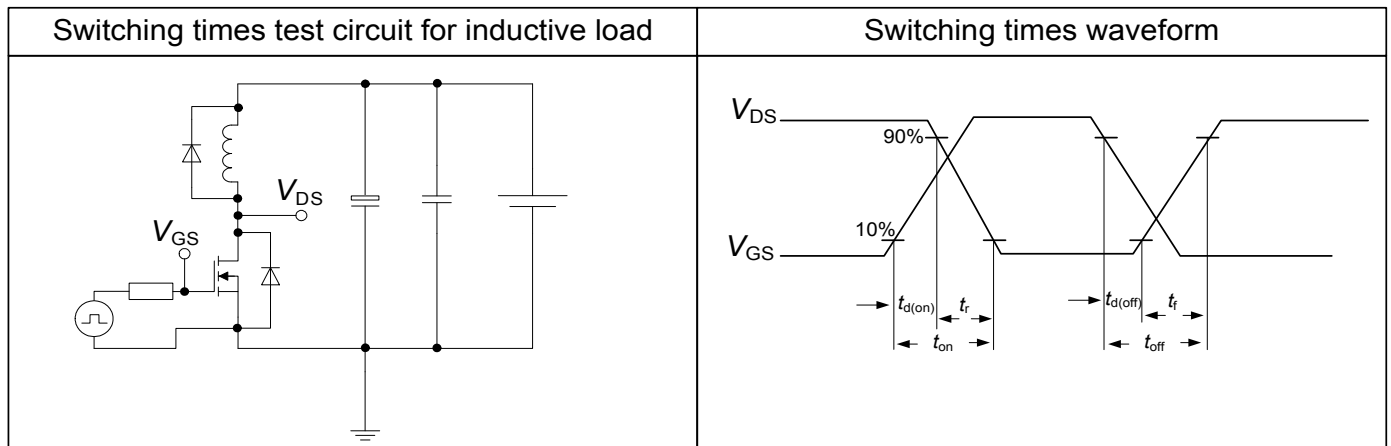
$E_{oss} = f(V_{DS})$

## 5 Test circuits

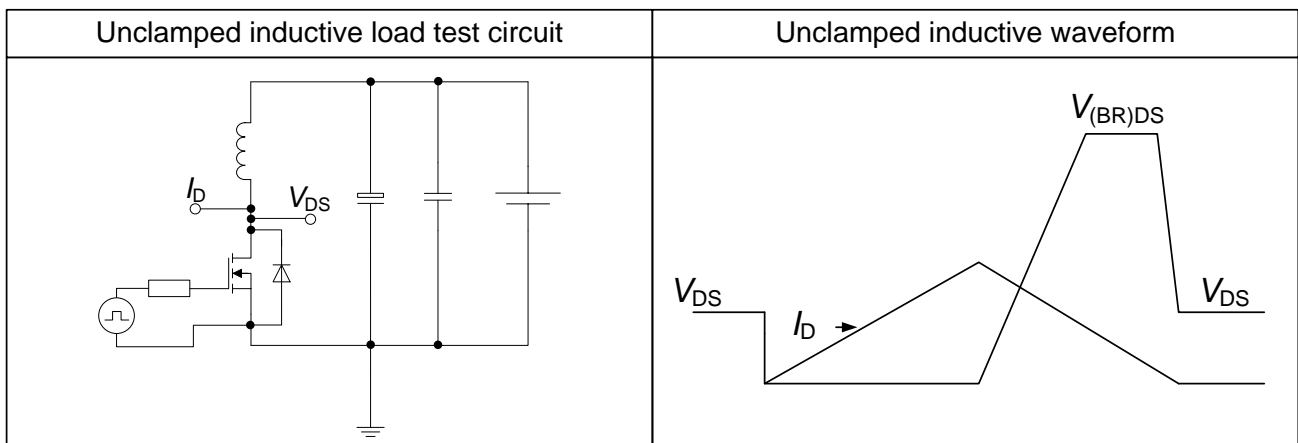
**Table 8 Diode characteristics**



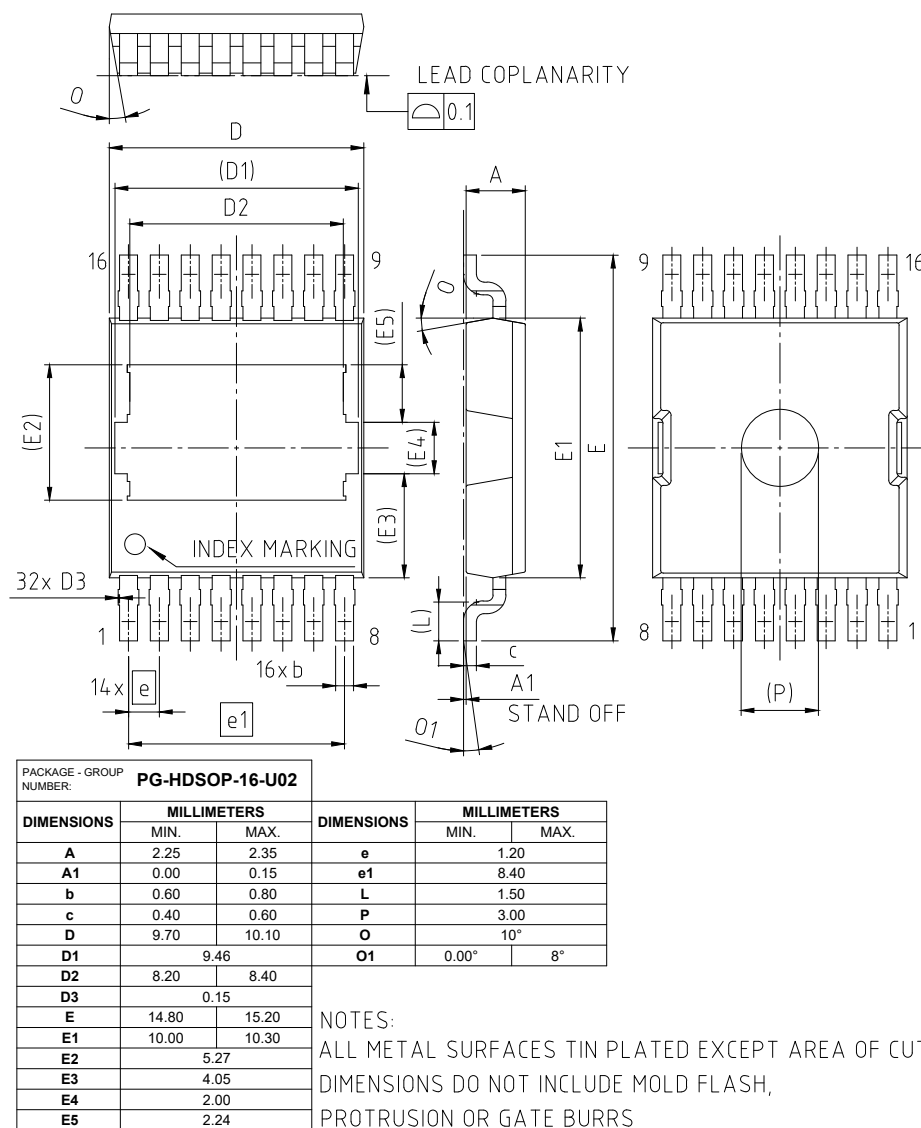
**Table 9 Switching times (ss)**



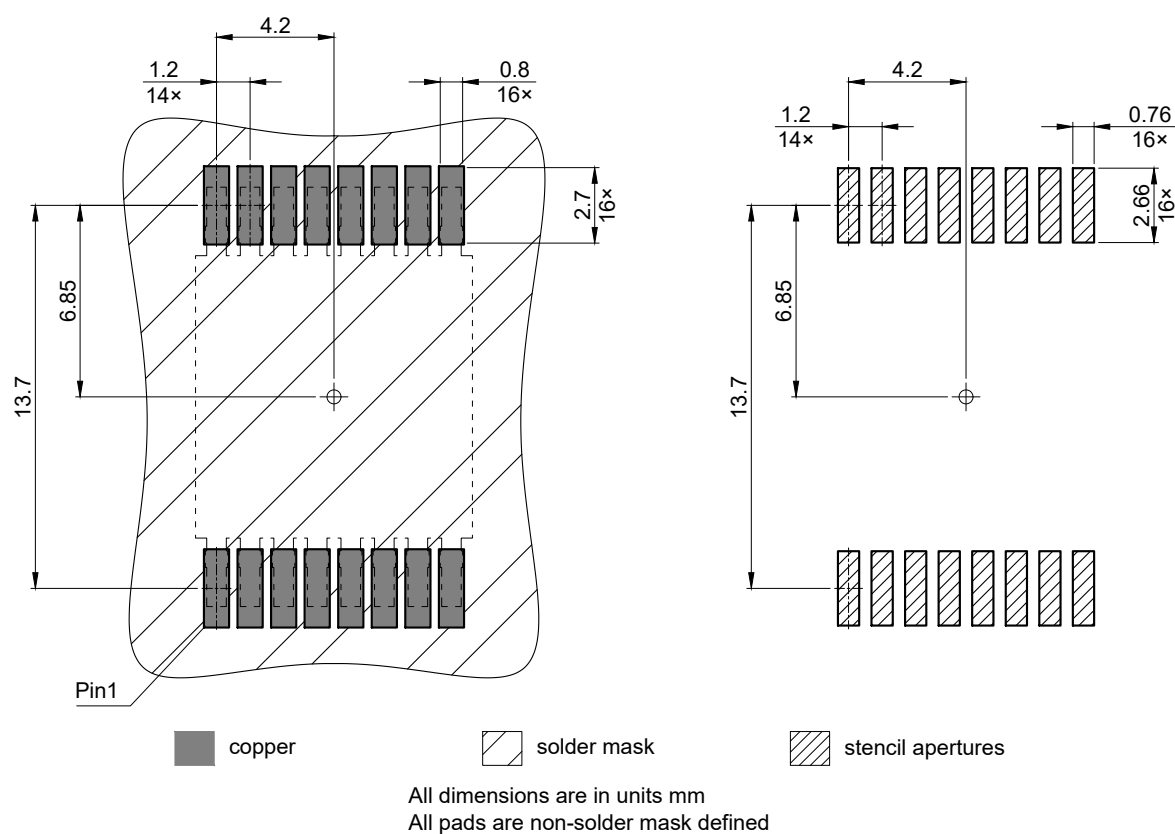
**Table 10 Unclamped inductive load (ss)**



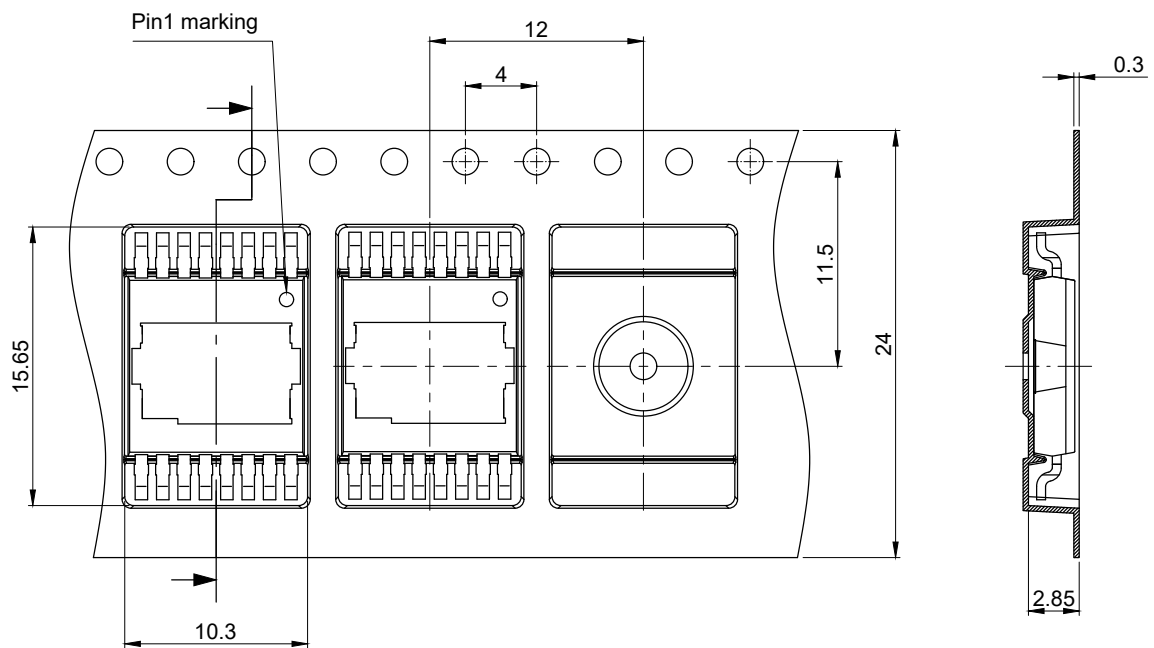
## 6 Package outlines



**Figure 1 Outline PG-HDSOP-16, dimensions in mm**



**Figure 2 Footprint drawing PG-HDSOP-16, dimensions in mm**



All dimensions are in units mm

The drawing is in compliance with ISO 128-30, Projection Method 1 [ ]

**Figure 3** Packaging variant PG-HDSOP-16, dimensions in mm

## 7 Appendix A

Table 11 Related links

- [IFX CoolMOS CM8 Webpage](#)
- [IFX CoolMOS CM8 application note](#)
- [IFX CoolMOS CM8 simulation model](#)
- [IFX Design tools](#)



**Revision history**

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IPLT60R180CM8

**Revision 2025-11-18, Rev. 2.0**

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Previous revisions

Revision	Date	Subjects (major changes since last revision)
2.0	2025-11-18	Release of final version

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