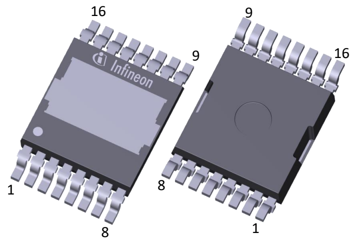
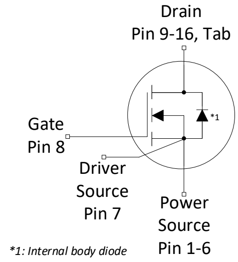
MOSFET

TOLT



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
$R_{DS(on),max}$	99	mΩ
$Q_{g,typ}$	31	nC
$I_{D,pulse}$	87	A
E_{oss} @ 400 V	4.2	µJ
Body diode di_F/dt	1300	A/µs
ESD class (HBM)	2	

Part number	Package	Marking	Related links
IPLT60R099CM8	PG-HDSOP-16	60R099C8	see Appendix A

Table of contents

1 Maximum ratings

at T_j = 25°C, unless otherwise specified

Table 2 Maximum ratings

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Continuous drain current [1]	I_D	-	-	30	A	T_C = 25°C
Continuous drain current	I_D	-	-	18	A	T_C = 100°C
Pulsed drain current [2]	$I_{D,pulse}$	-	-	87	A	T_C = 25°C
Avalanche energy, single pulse	E_{AS}	-	-	51	mJ	I_D = 2.7 A; V_{DD} = 50 V; see table 10
Avalanche energy, repetitive	E_{AR}			0.26		
Avalanche current, single pulse	I_{AS}	-	-	2.7	A	-
MOSFET dv/dt ruggedness	dv/dt	-	-	120	V/ns	V_{DS} = 0...400 V
Gate source voltage (static)	V_{GS}	-20	-	20	V	static;
Gate source voltage (dynamic)	V_{GS}	-30	-	30	V	AC (f > 1 Hz)
Power dissipation	P_{tot}	-	-	186	W	T_C = 25°C
Storage temperature	T_{stg}	-55	-	150	°C	-
Operating junction temperature	T_j					
Extended operating junction temperature	T_j	150	-	175	°C	≤ 50 h in the application lifetime
Mounting torque	-	-	-	-	Ncm	-
Continuous diode forward current	I_S	-	-	30	A	T_C = 25°C
Diode pulse current [2]	$I_{S,pulse}$			87		
Reverse diode dv/dt [3]	dv/dt	-	-	70	V/ns	V_{DS} = 0...400 V, I_{SD} ≤ 30 A, T_j = 25°C see table 8
Maximum diode commutation speed	di_F/dt			1300	A/µs	
Insulation withstand voltage	V_{ISO}	-	-	n.a.	V	V_{rms}, T_C = 25°C, t = 1 min

[1] Limited by $T_{j,max}$.
[2] Pulse width t_p limited by $T_{j,max}$
[3] 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}	-	-	0.67	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 cm² (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°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 V, I_D = 1 mA
Gate threshold voltage	$V_{(GS)th}$	3.7	4.2	4.7	V	V_{DS} = V_{GS}, I_D = 0.26 mA
Zero gate voltage drain current	I_{DSS}	-	-	1	µA	V_{DS} = 600 V, V_{GS} = 0 V, T_j = 25°C
			35.5	-		V_{DS} = 600 V, V_{GS} = 0 V, T_j = 150 °C
Gate-source leakage current	I_{GSS}	-	-	2	µA	V_{GS} = 20 V, V_{DS} = 0 V
Drain-source on-state resistance	$R_{DS(on)}$	-	0.083	0.099	Ω	V_{GS} = 10 V, I_D = 10.1 A, T_j = 25°C
			0.183	-		V_{GS} = 10 V, I_D = 10.1 A, T_j = 150°C
Gate resistance	R_G	-	8.9	-	Ω	f = 1 MHz

Table 5 Dynamic characteristics

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Input capacitance	C_{iss}	-	1330	-	pF	V_{GS} = 0 V, V_{DS} = 400 V, f = 250 kHz
Output capacitance	C_{oss}		18			
Effective output capacitance, energy related [4)]	$C_{o(er)}$	-	53	-	pF	V_{GS} = 0 V, V_{DS} = 0...400 V
Effective output capacitance, time related [5)]	$C_{o(tr)}$	-	533	-	pF	I_D = constant, V_{GS} = 0 V, V_{DS} = 0...400 V
Turn-on delay time	$t_{d(on)}$	-	16	-	ns	V_{DD} = 400 V, V_{GS}=13 V, I_D = 5.1 A, R_G = 5.3 Ω; see table 9
Rise time	t_r		6			
Turn-off delay time	$t_{d(off)}$		90			
Fall time	t_f		10			

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

5) $C_{o(tr)}$ 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

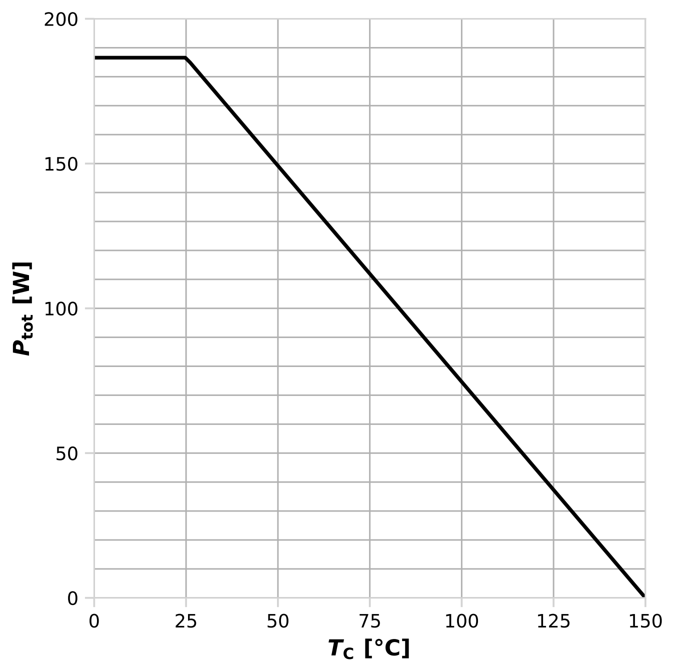
Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}	-	8	-	nC	V_{DD} = 400 V, I_D = 5.1 A, V_{GS} = 0 to 10 V
Gate to drain charge	Q_{gd}		11		nC	
Gate charge total	Q_g		31		nC	
Gate plateau voltage	$V_{plateau}$		6.0		V	

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 V, I_F = 5.1 A, T_j = 25°C
Reverse recovery time	t_{rr}	-	77	97	ns	V_R = 400 V, I_F = 5.1 A, di_F/dt = 100 A/µs; see table 8
Reverse recovery charge	Q_{rr}		0.30	0.45	µC	
Peak reverse recovery current	I_{rrm}		7.8	-	A	

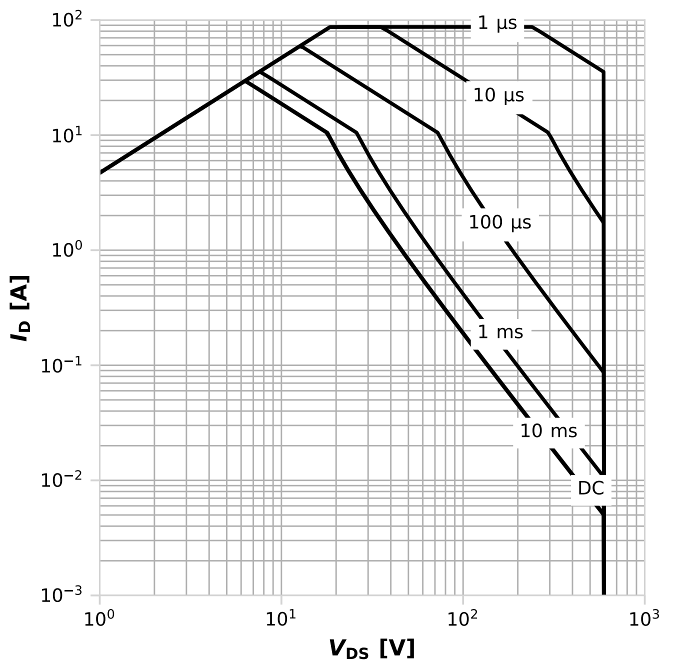
4 Electrical characteristics diagrams

Diagram 1: Power dissipation



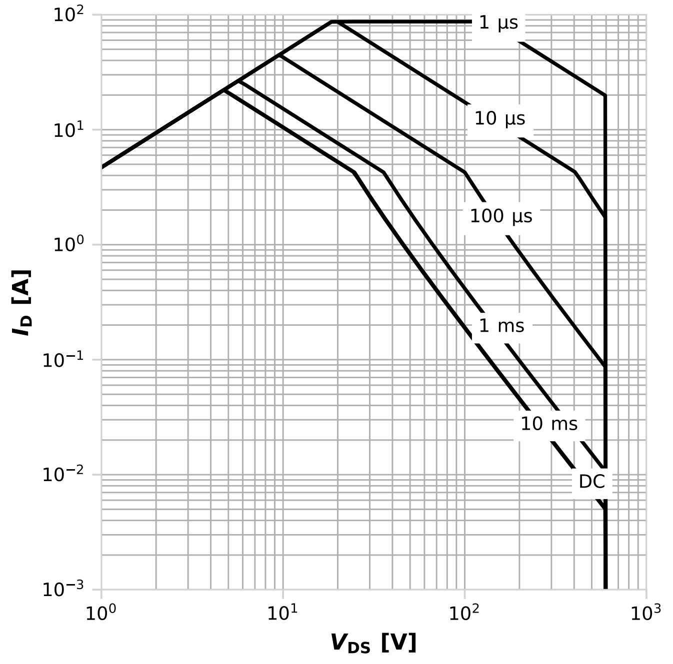
$P_{tot} = f(T_C)$

Diagram 2: Safe operating area



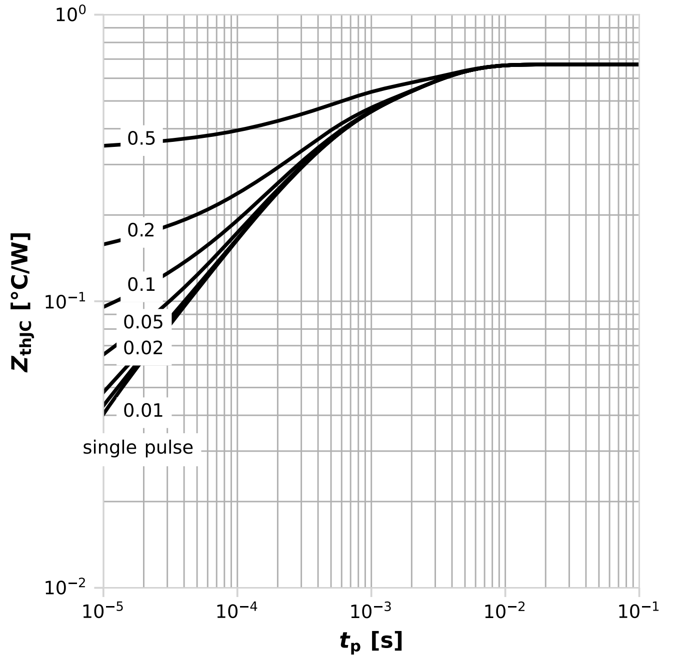
$I_D = f(V_{DS})$; $T_C = 25°C$; $D = 0$; parameter: t_p

Diagram 3: Safe operating area



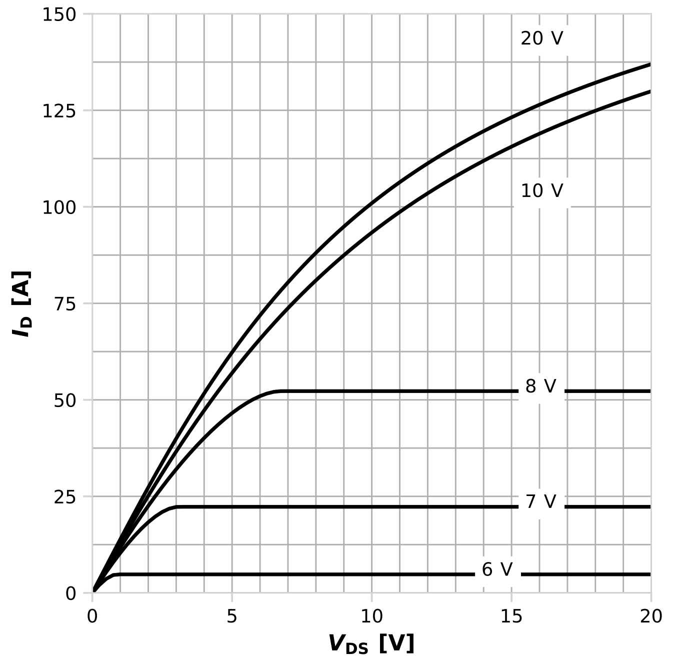
$I_D = f(V_{DS})$; $T_C = 80°C$; $D = 0$; parameter: t_p

Diagram 4: Max. transient thermal impedance



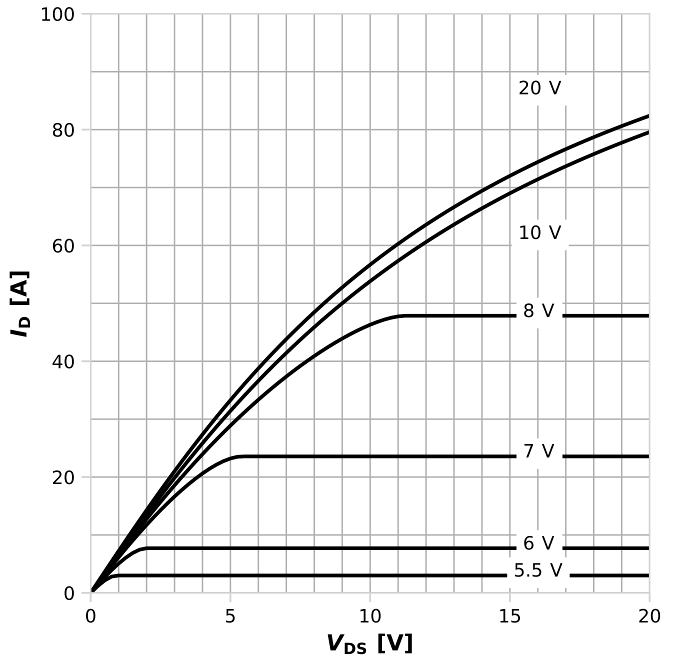
$Z_{thJC} = f(t_P)$; parameter: $D = t_p / T$

Diagram 5: Typ. output characteristics



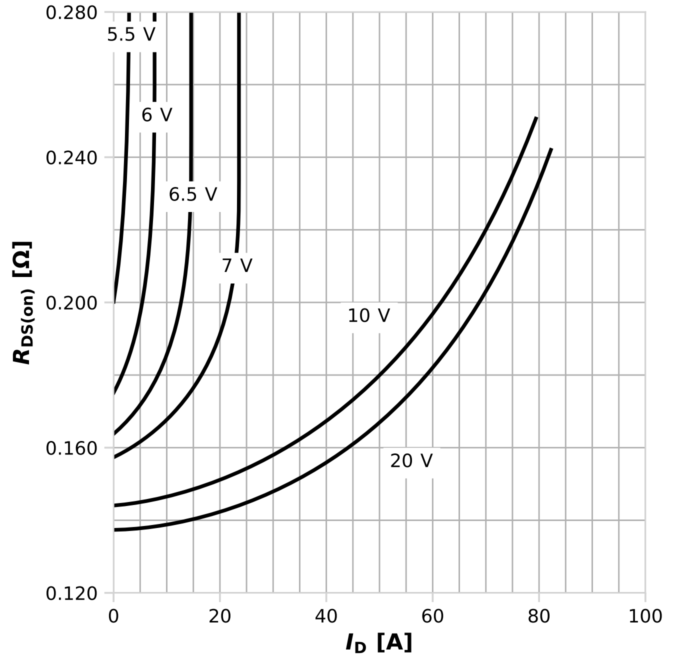
$I_D = f(V_{DS})$; $T_j = 25°C$; parameter: V_{GS}

Diagram 6: Typ. output characteristics



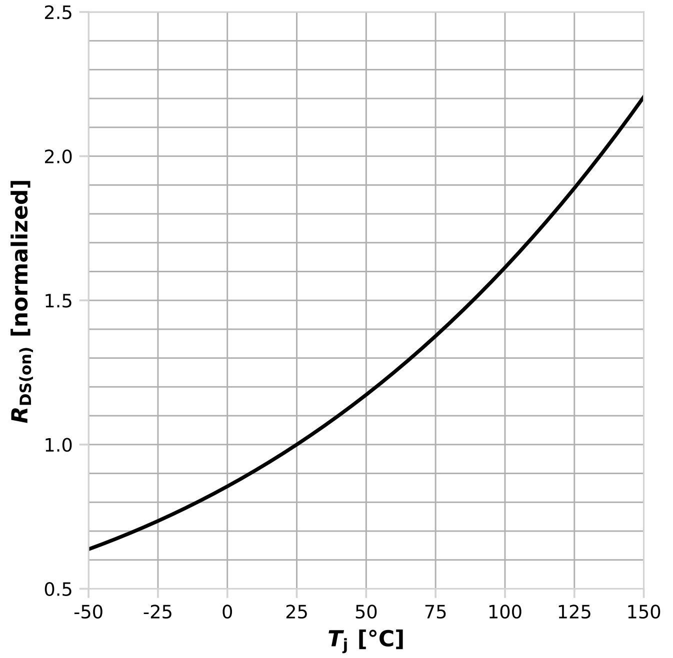
$I_D = f(V_{DS})$; $T_j = 125°C$; parameter: V_{GS}

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



$R_{DS(on)} = f(I_D)$; $T_j = 125°C$; parameter: V_{GS}

Diagram 8: Drain-source on-state resistance



$R_{DS(on)} = f(T_j)$; $I_D = 10.1$ A; $V_{GS} = 10$ V

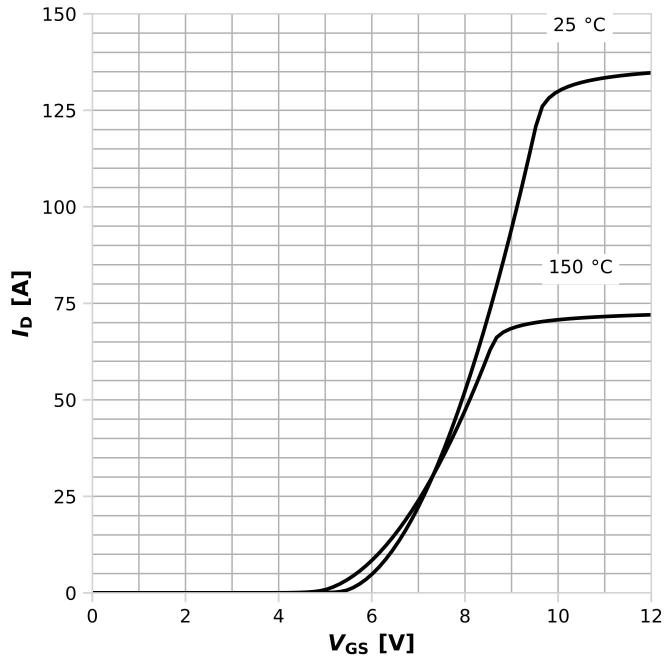
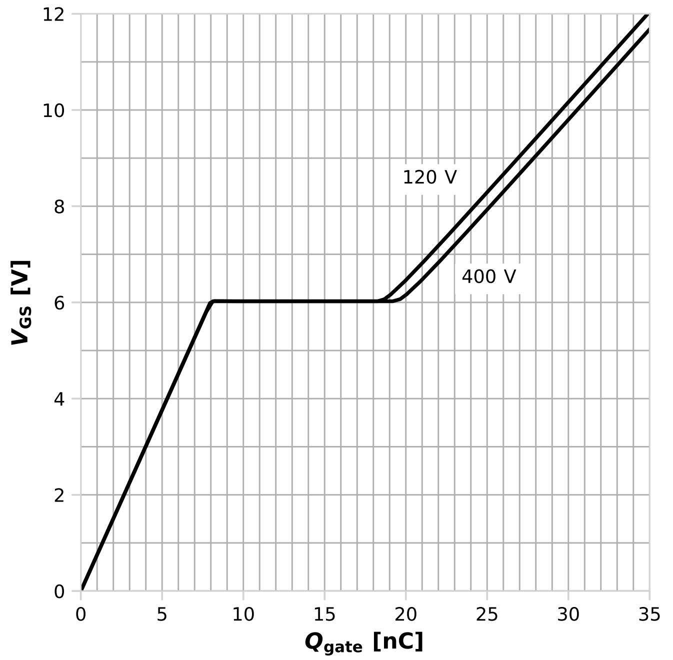
Diagram 9: Typ. transfer characteristics	Diagram 10: Typ. gate charge
	
$I_D = f(V_{GS})$; $V_{DS} = 20$ V; parameter: T_j	$V_{GS} = f(Q_{gate})$; $I_D = 5.1$ A pulsed; parameter: V_{DD}

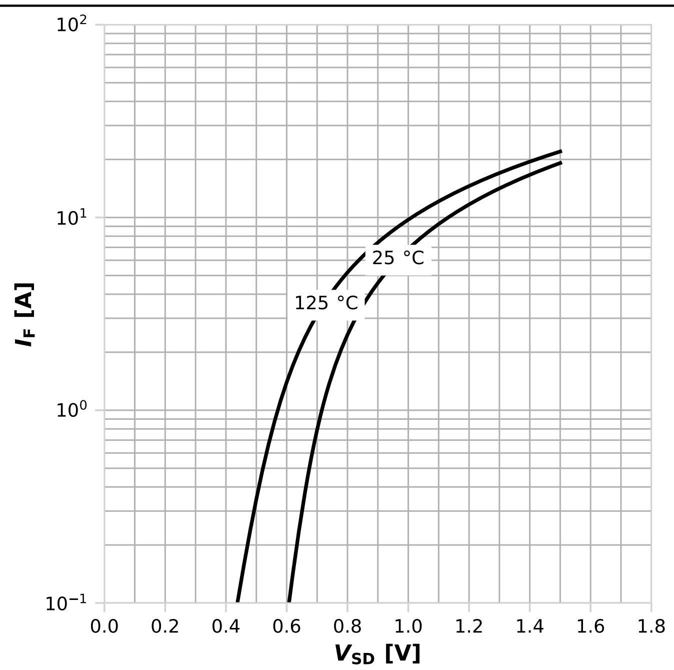
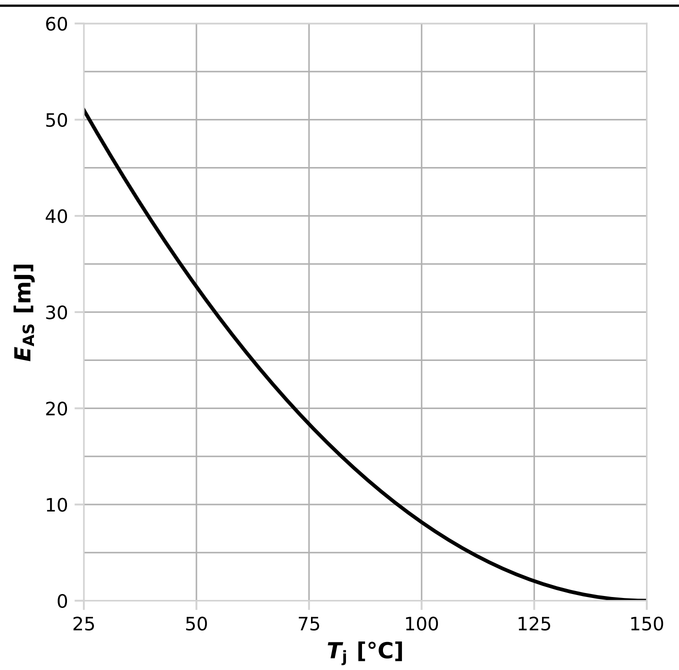
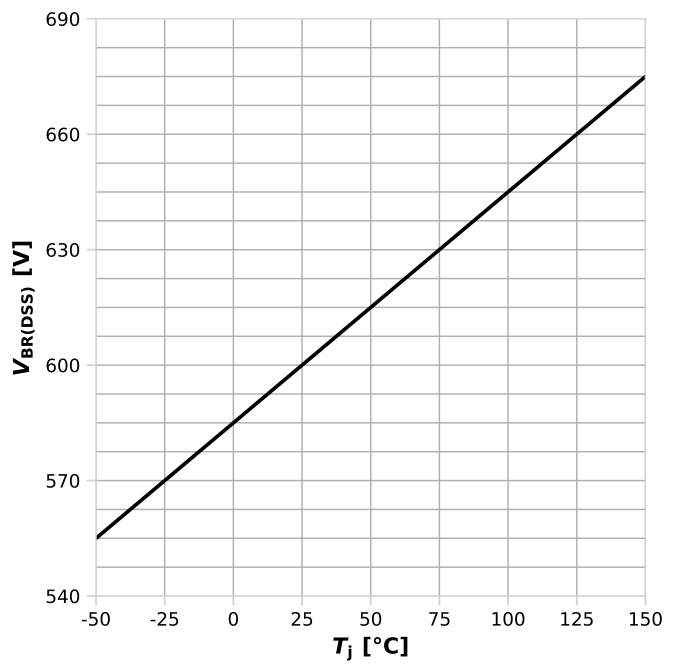
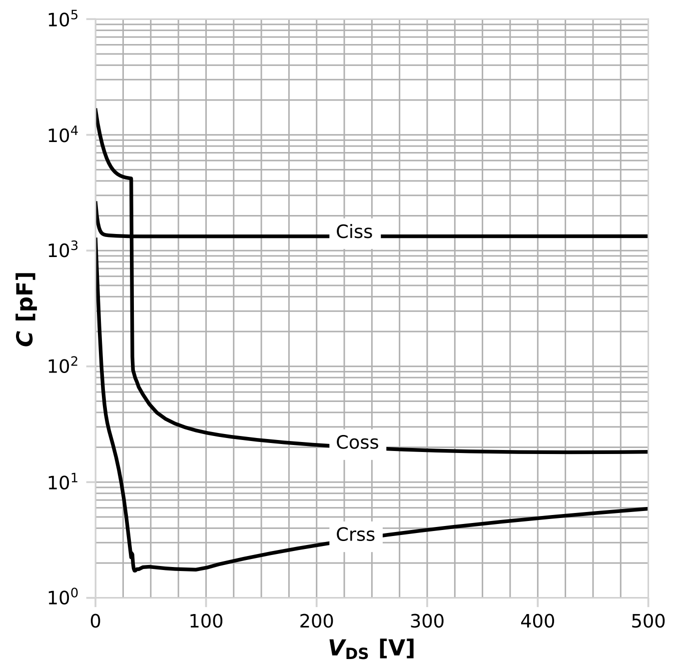
Diagram 11: Forward characteristics of reverse diode	Diagram 12: Avalanche energy
	
$I_F = f(V_{SD})$; parameter: T_j	$E_{AS} = f(T_j)$; $I_D = 2.7$ A; $V_{DD} = 50$ V

Diagram 13: Drain-source breakdown voltage



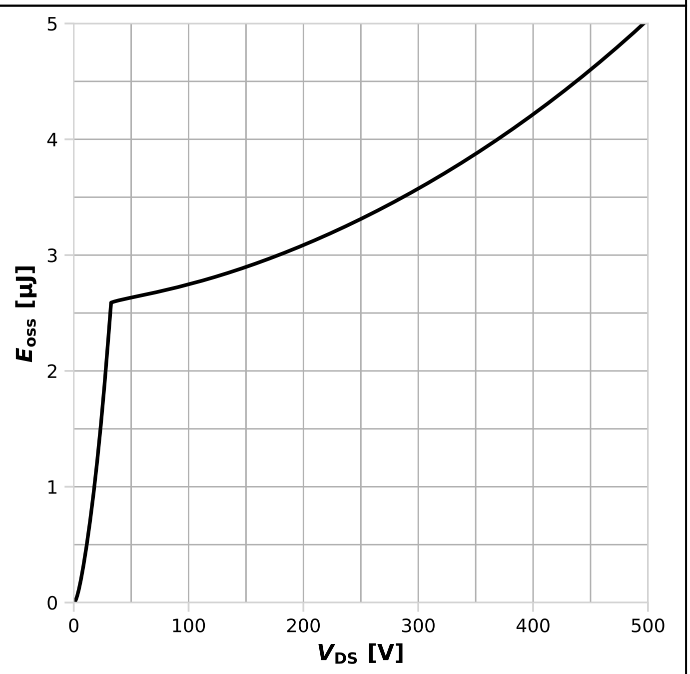
$V_{BR(DSS)} = f(T_j)$; $I_D = 1$ mA

Diagram 14: Typ. capacitances



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

Diagram 15: Typ. Coss stored energy



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

5 Test circuits

Table 8 Diode characteristics

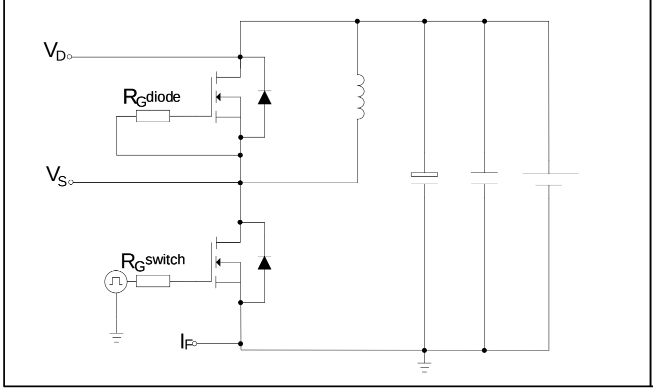
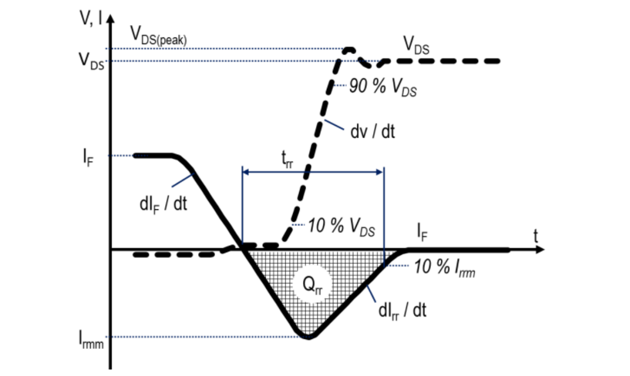
Test circuit for diode characteristics	Diode recovery waveform
	

Table 9 Switching times (ss)

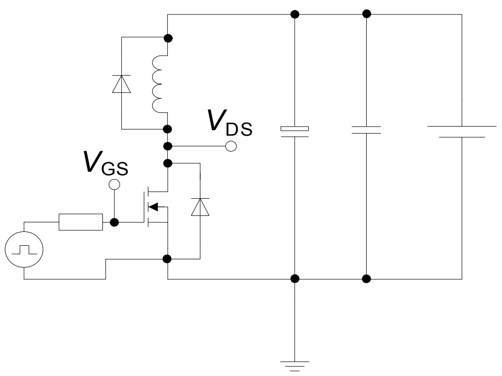
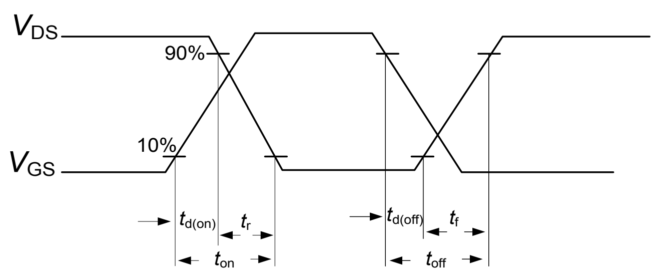
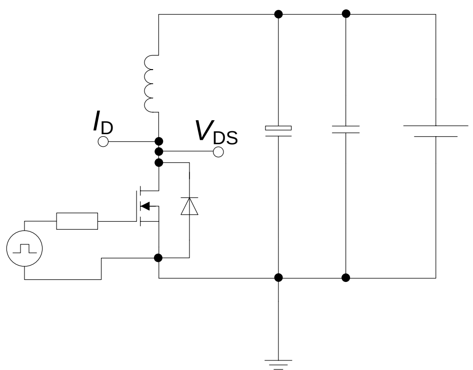
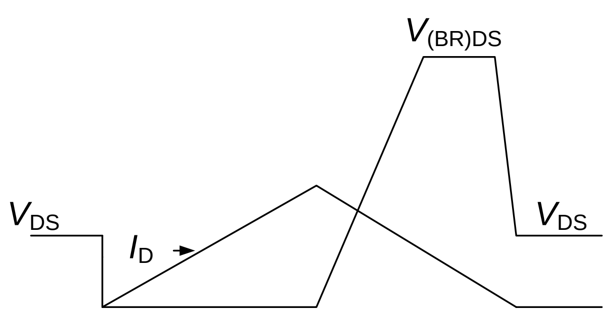
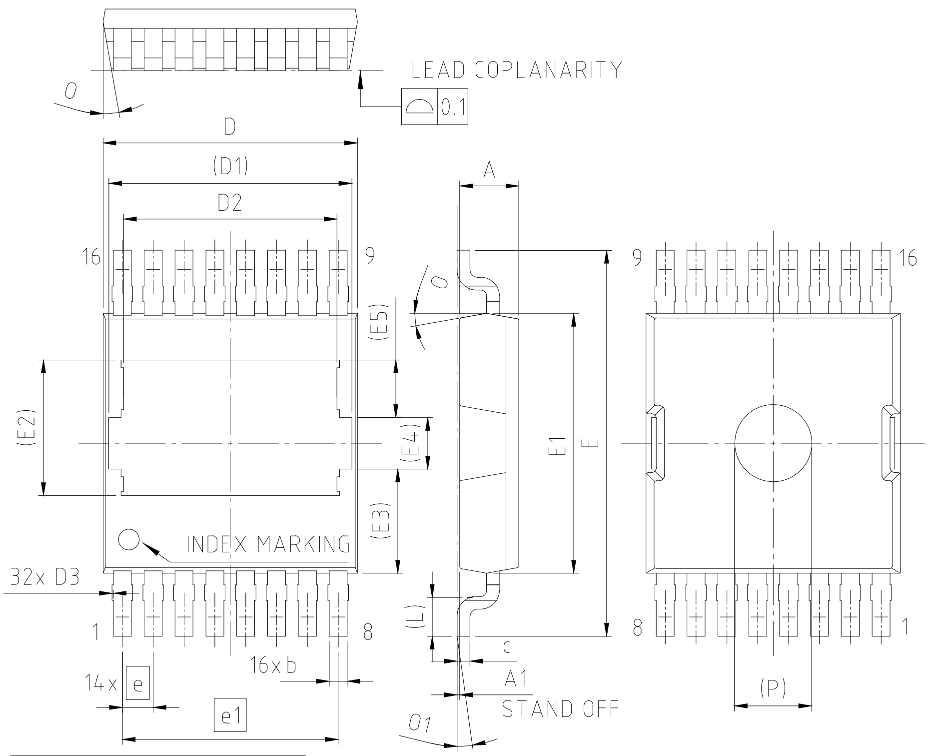
Switching times test circuit for inductive load	Switching times waveform
	

Table 10 Unclamped inductive load (ss)

Unclamped inductive load test circuit	Unclamped inductive waveform
	

6 Package outlines



PACKAGE - GROUP NUMBER: **PG-HDSOP-16-U02**

DIMENSIONS	MILLIMETERS MIN.	MILLIMETERS MAX.
A	2.25	2.35
A1	0.00	0.15
b	0.60	0.80
c	0.40	0.60
D	9.70	10.10
D1	9.46	
D2	8.20	8.40
D3	0.15	
E	14.80	15.20
E1	10.00	10.30
E2	5.27	
E3	4.05	
E4	2.00	
E5	2.24	

DIMENSIONS	MILLIMETERS MIN.	MILLIMETERS MAX.
e	1.20	
e1	8.40	
L	1.50	
P	3.00	
O	10°	
O1	0.00°	8°

NOTES:
ALL METAL SURFACES TIN PLATED EXCEPT AREA OF CUT
DIMENSIONS DO NOT INCLUDE MOLD FLASH,
PROTRUSION OR GATE BURRS

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

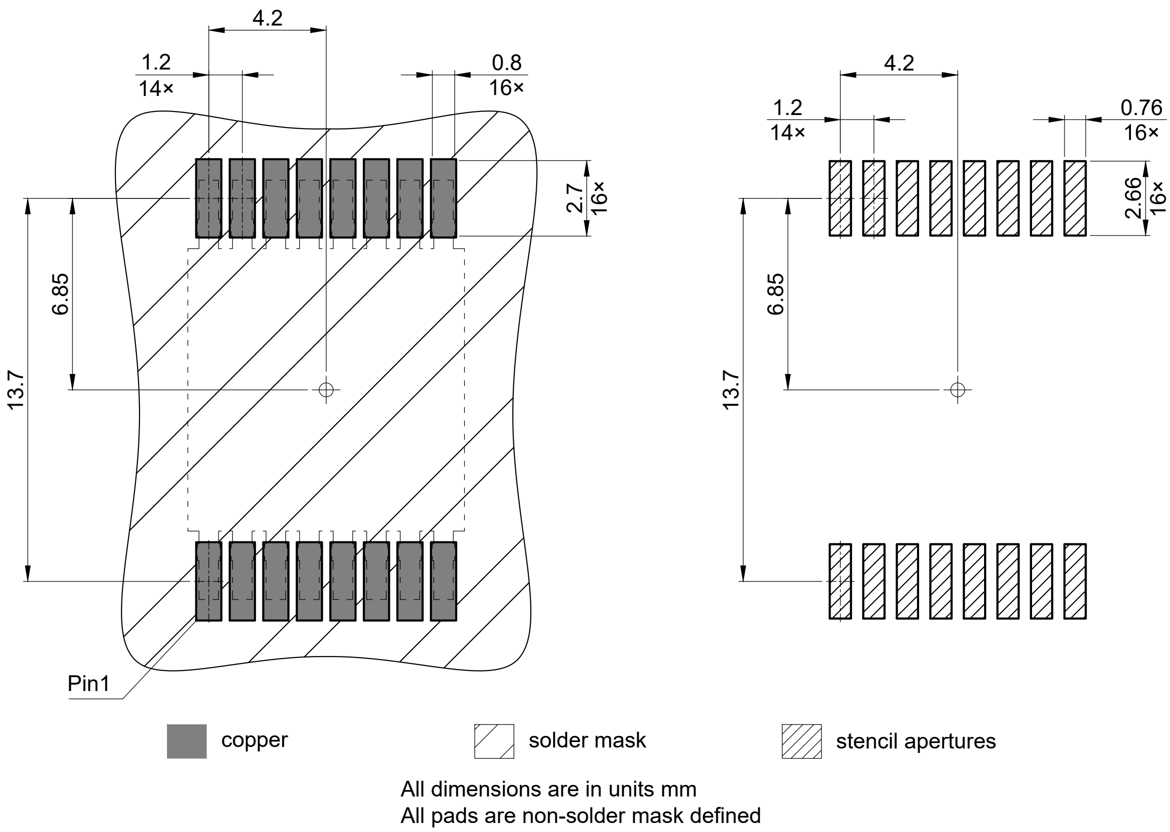


Figure 2 Footprint drawing PG-HDSOP-16, dimensions in mm

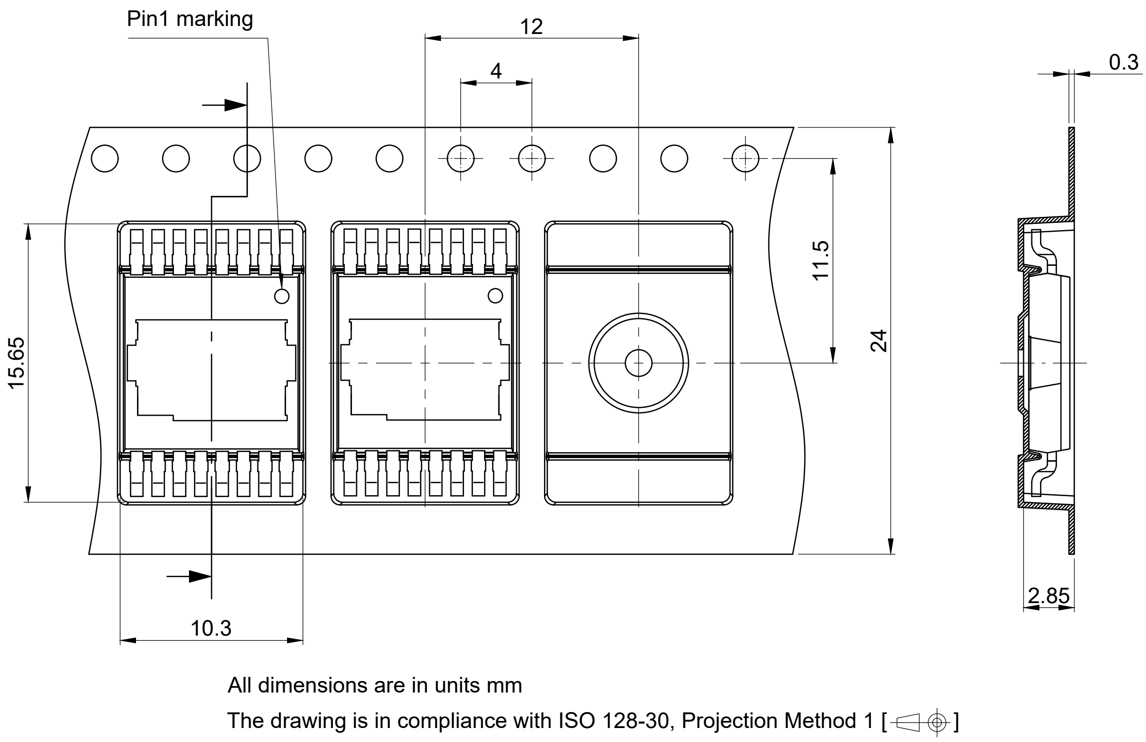


Figure 3 Packaging variant PG-HDSOP-16, dimensions in mm

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

IPLT60R099CM8

Revision 2025-11-18, Rev. 2.0

Previous revisions

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

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