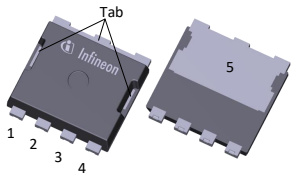
MOSFET

600V CoolMOS™ CM8 Power Transistor

ThinTOLL



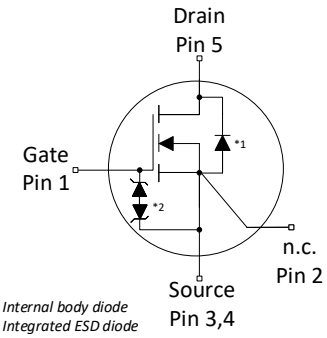
Built on Infineon's world-class super-junction MOSFET platform with an integrated fast body diode, making it suitable for a wide range of applications. It enables highest power density at lowest possible system cost with superior reliability. It is enhancing Infineon's WBG offering and the successor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

Features

- CoolMOS™ 8 technology optimized for efficiency and system cost
- ThinTOLL 8x8 package with Infineon .XT interconnect technology
- Fast body diode and integrated ESD protection
- Excellent thermal and switching performance
- High commutation ruggedness

Benefits

- Proven robustness for long product lifetime
- 5x higher TCoB robustness compared to ThinPAK
- Increased power density with reduced cooling requirements
- Robust operation in hard- and soft-switching topologies
- Easy migration and accelerated design-in



Potential applications

- Refrigerator and freezer compressors
- TV and monitor power supplies
- Charger and adapter power supplies
- Low-power AC/DC SMPS
- Small home appliance drives

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
$R_{DS(on),max}$	600	mΩ
$Q_{g,typ}$	6	nC
$I_{D,pulse}$	14	A
E_{oss} @ 400V	0.9	µJ
Body diode di_F/dt	1300	A/µs
ESD class (HBM)	2	

Part number	Package	Marking	Related links
IPTA60R600CM8	PG-LHSOF-4	60R600C8	see Appendix A

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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	-	-	6	A	T_C=25°C
Continuous drain current	I_D	-	-	3	A	T_C=100°C
Pulsed drain current [2]	$I_{D,pulse}$	-	-	14	A	T_C=25°C
Avalanche energy, single pulse	E_{AS}	-	-	8	mJ	I_D=1.0A; V_{DD}=50V; see table 10
Avalanche energy, repetitive	E_{AR}			0.04		
Avalanche current, single pulse	I_{AS}	-	-	1.0	A	-
MOSFET dv/dt ruggedness	dv/dt	-	-	120	V/ns	V_{DS}=0...400V
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}	-	-	47	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	-	-	6	A	T_C=25°C
Diode pulse current [2]	$I_{S,pulse}$			14		
Reverse diode dv/dt [3]	dv/dt	-	-	70	V/ns	V_{DS}=0...400V, I_{SD}≤6A, 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=1min

[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}	-	-	2.65	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}	-	35	45	K/W	Device on 40mm*40mm*1.5mm epoxy PCB FR4 with 6cm² (one layer, 70µm 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}=0V, I_D=1mA
Gate threshold voltage	$V_{(GS)th}$	3.7	4.2	4.7	V	V_{DS}=V_{GS}, I_D=0.04mA
Zero gate voltage drain current	I_{DSS}	-	-	1	µA	V_{DS}=600V, V_{GS}=0V, T_j=25°C
			8.9	-		V_{DS}=600V, V_{GS}=0V, T_j=150°C
Gate-source leakage current	I_{GSS}	-	-	2.2	µA	V_{GS}=20V, V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	0.500	0.600	Ω	V_{GS}=10V, I_D=1.7A, T_j=25°C
			1.105	-		V_{GS}=10V, I_D=1.7A, T_j=150°C
Gate resistance	R_G	-	24	-	Ω	f=1MHz

Table 5 Dynamic characteristics

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Input capacitance	C_{iss}	-	230	-	pF	V_{GS}=0V, V_{DS}=400V, f=250kHz
Output capacitance	C_{oss}		5			
Effective output capacitance, energy related [4]	$C_{o(er)}$	-	11	-	pF	V_{GS}=0V, V_{DS}=0...400V
Effective output capacitance, time related [5]	$C_{o(tr)}$	-	96	-	pF	I_D=constant, V_{GS}=0V, V_{DS}=0...400V
Turn-on delay time	$t_{d(on)}$	-	9.5	-	ns	V_{DD}=400V, V_{GS}=13V, I_D=0.8A, R_G=11.0Ω; see table 9
Rise time	t_r		4.8			
Turn-off delay time	$t_{d(off)}$		58.5			
Fall time	t_f		20			

[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 400V

[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

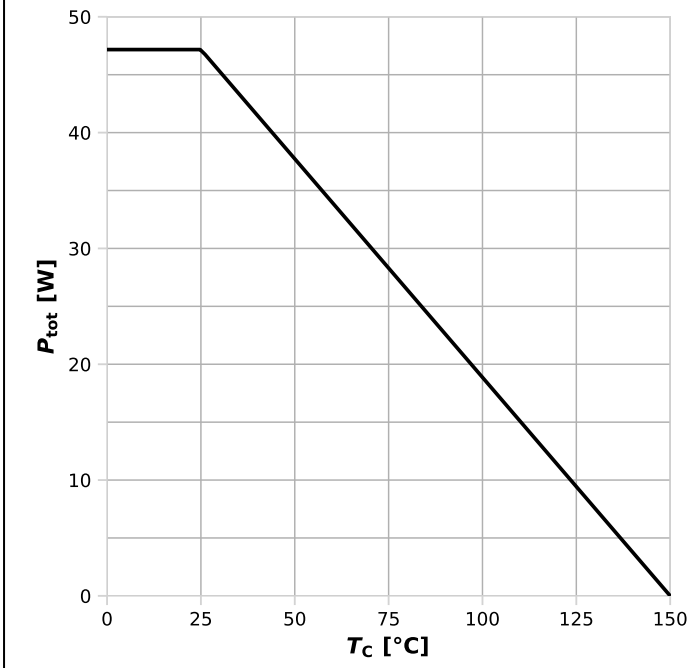
Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}	-	1	-	nC	V_{DD}=400V, I_D=0.8A, V_{GS}=0 to 10V
Gate to drain charge	Q_{gd}		3		nC	
Gate charge total	Q_g		6		nC	
Gate plateau voltage	$V_{plateau}$		6.3		V	

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}=0V, I_F=0.8A, T_j=25°C
Reverse recovery time	t_{rr}	-	37	46	ns	V_R=400V, I_F=0.8A, di_F/dt=100A/µs; see table 8
Reverse recovery charge	Q_{rr}		0.07	0.11	µC	
Peak reverse recovery current	I_{rrm}		3.4	-	A	

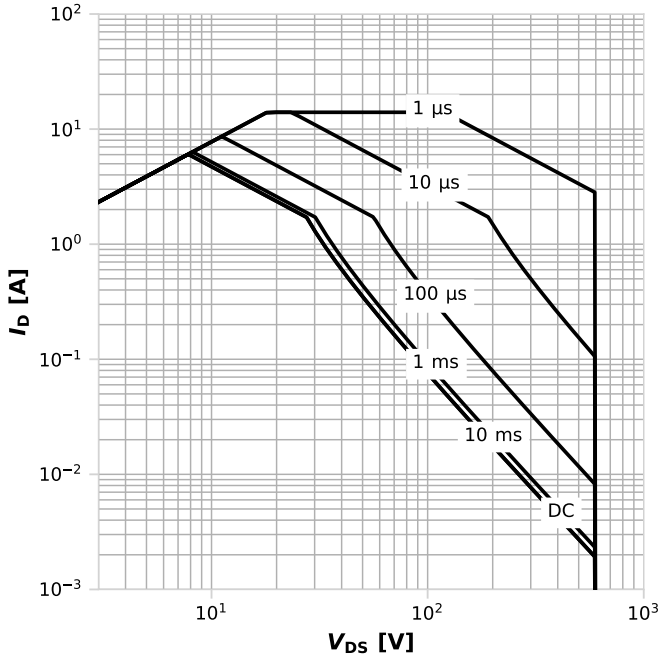
4 Electrical characteristics diagrams

Diagram 1: Power dissipation



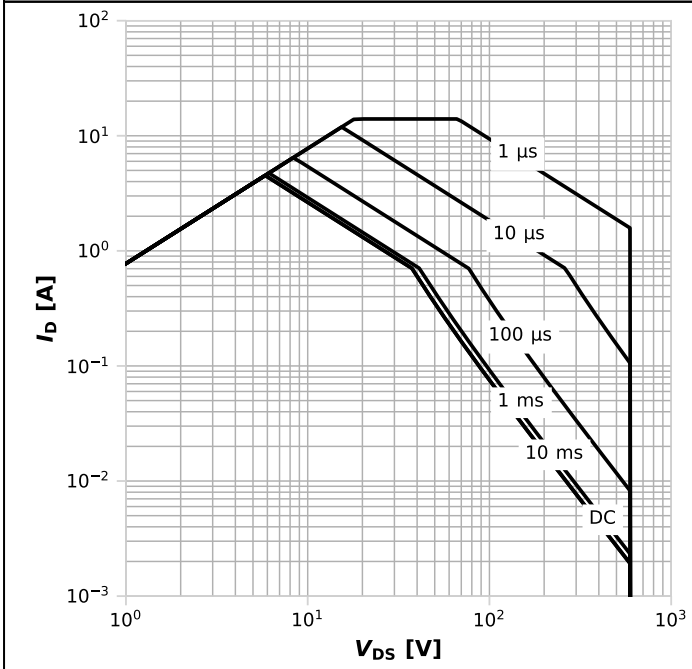
P_{tot}=f(T_C)

Diagram 2: Safe operating area



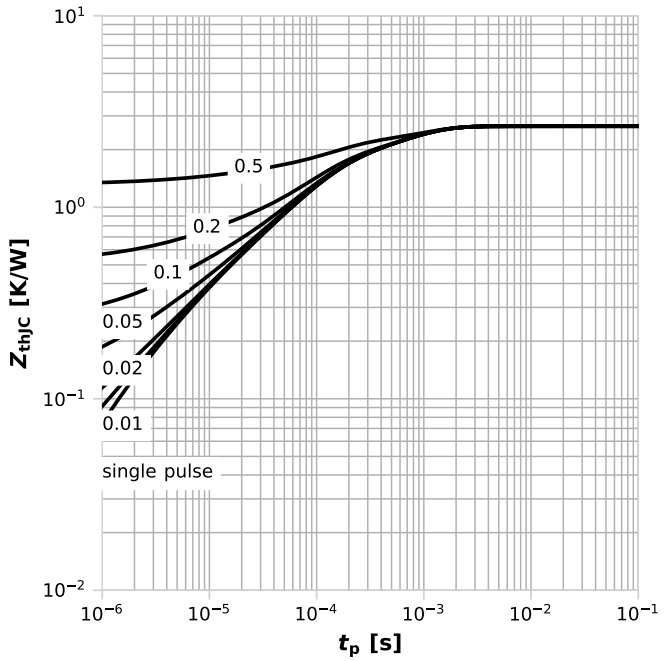
I_D=f(V_{DS}); T_C=25 °C; D=0; parameter: t_p

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

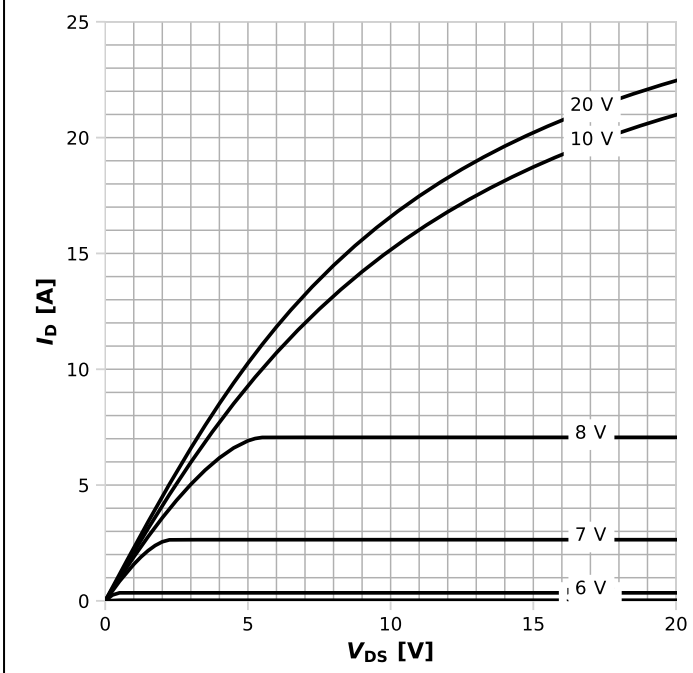
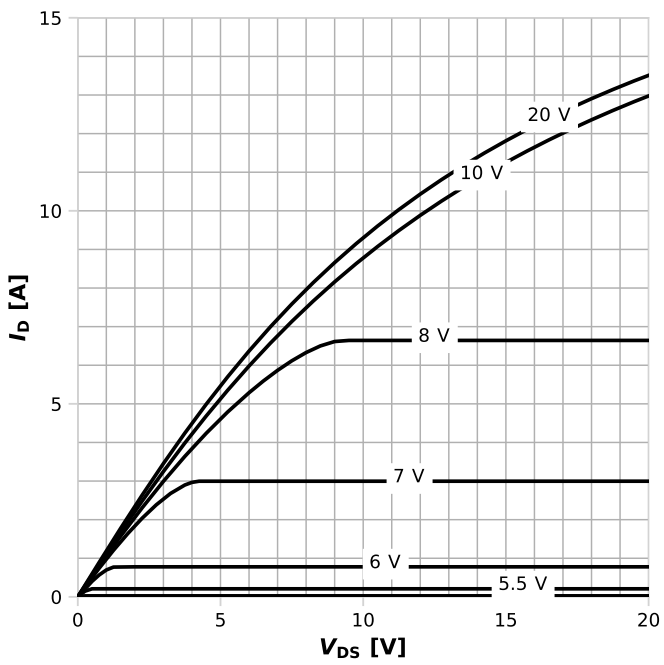
Diagram 5: Typ. output characteristics	Diagram 6: Typ. output characteristics
	
I_D=f(V_{DS}); T_j=25 °C; parameter: V_{GS}	I_D=f(V_{DS}); T_j=125 °C; parameter: V_{GS}

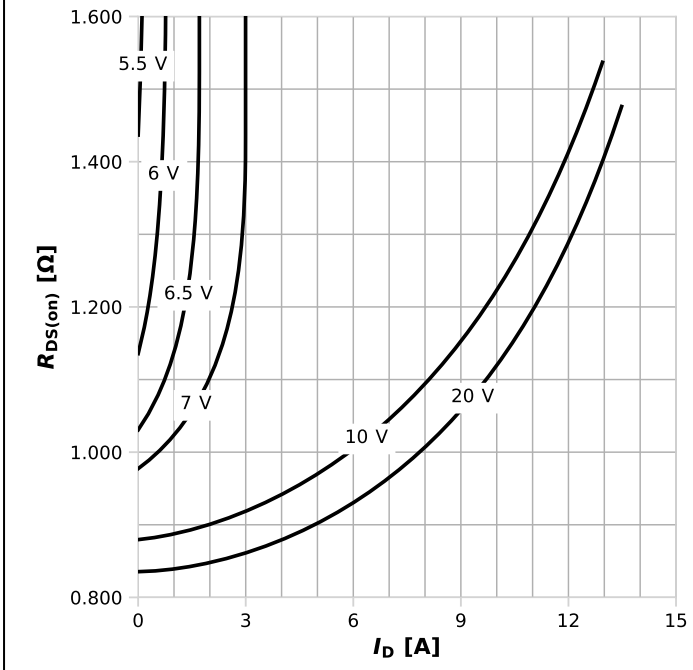
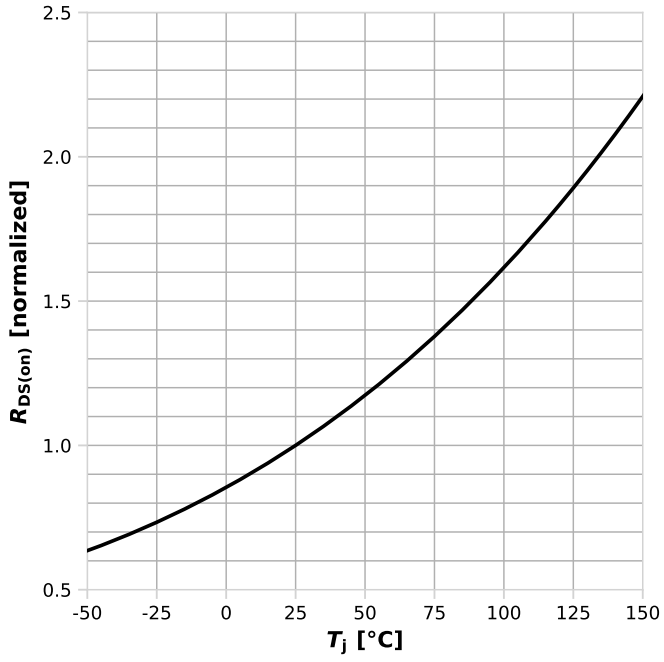
Diagram 7: Typ. drain-source on-state resistance	Diagram 8: Drain-source on-state resistance
	
$R_{DS(on)}$=f(I_D); T_j=125 °C; parameter: V_{GS}	$R_{DS(on)}$=f(T_j); I_D=1.7 A; V_{GS}=10 V

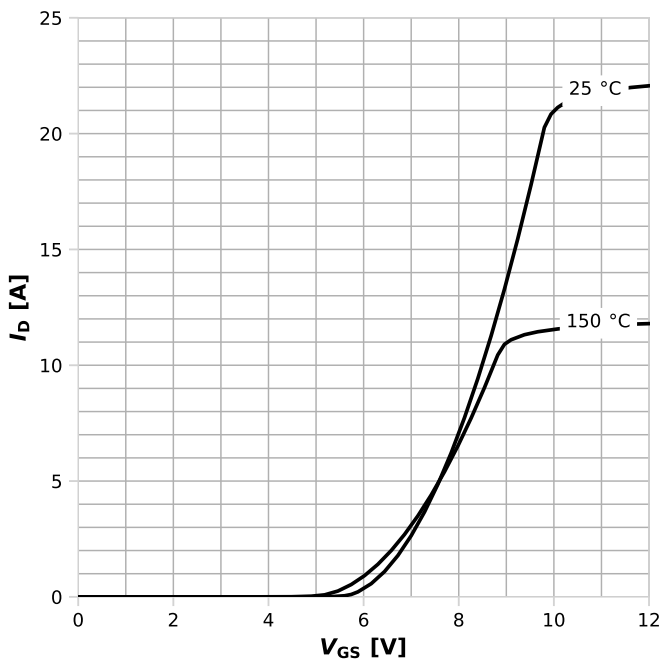
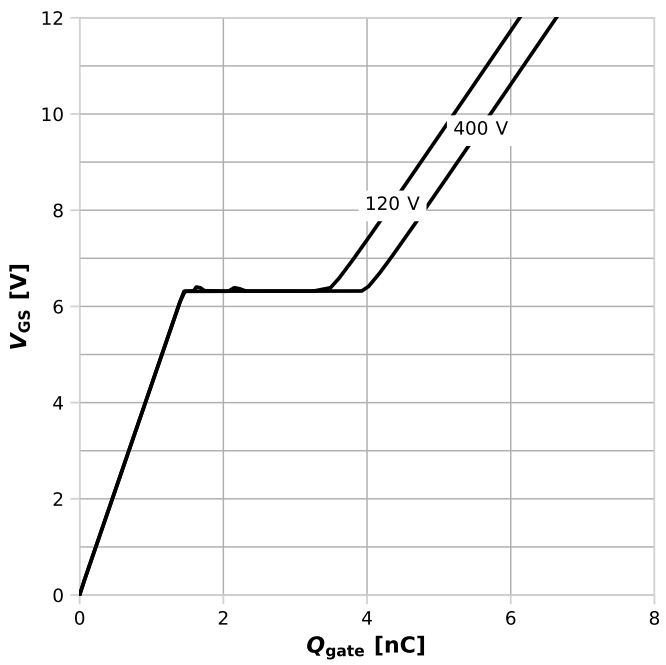
Diagram 9: Typ. transfer characteristics	Diagram 10: Typ. gate charge
	
I_D=f(V_{GS}); V_{DS}=20V; parameter: T_j	V_{GS}=f(Q_{gate}); I_D=0.8 A pulsed; parameter: V_{DD}

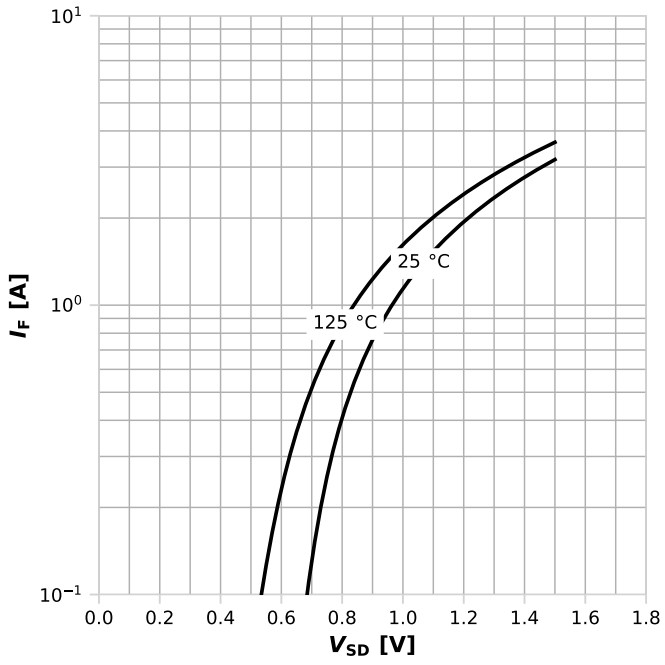
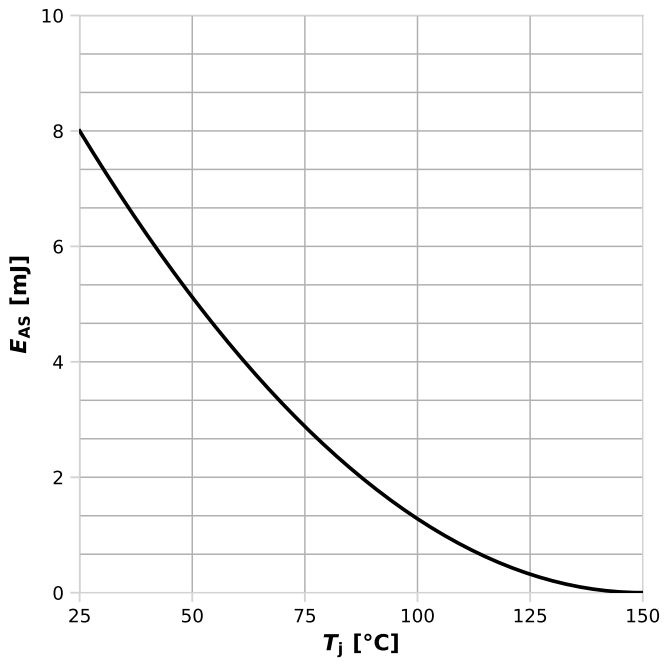
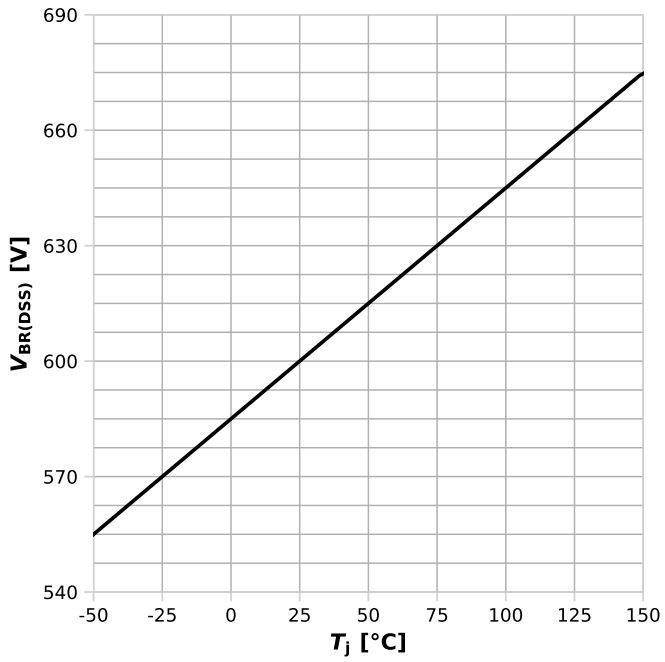
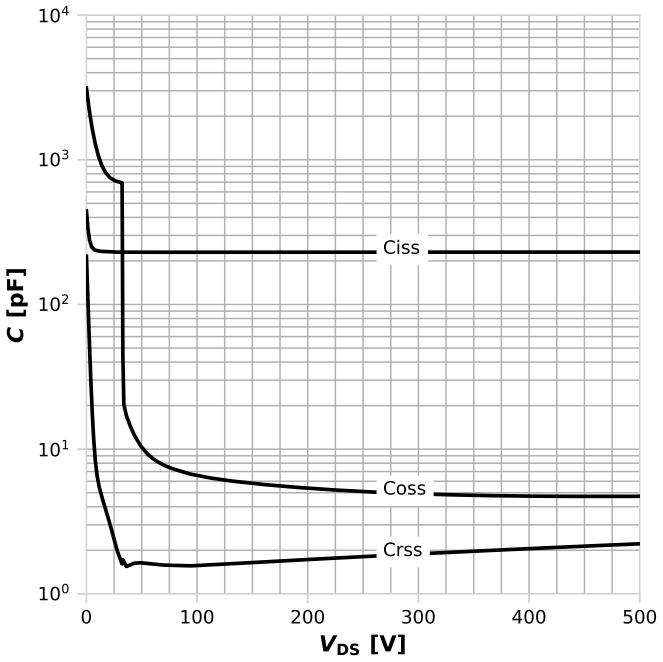
Diagram 11: Forward characteristics of reverse diode	Diagram 12: Avalanche energy
	
I_F=f(V_{SD}); parameter: T_j	E_{AS}=f(T_j); I_D=1.0 A; V_{DD}=50 V

Diagram 13: Drain-source breakdown voltage



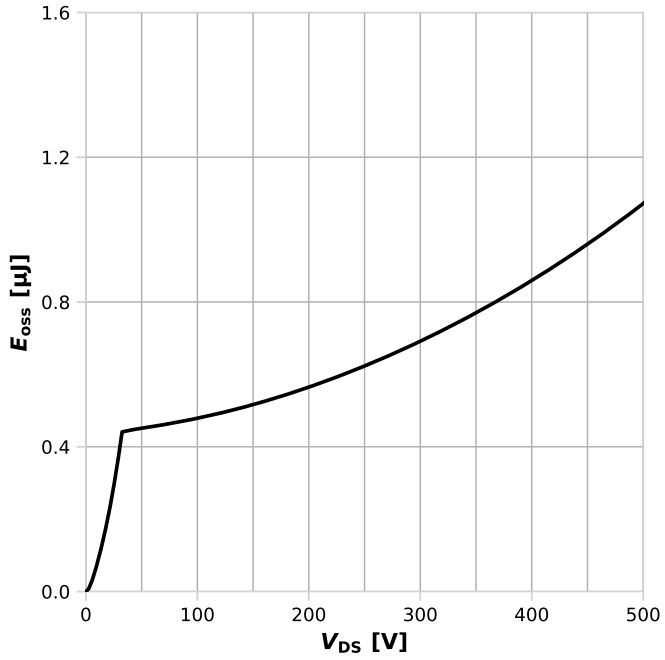
$V_{BR(DSS)}$=f(T_j); I_D=1 mA

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

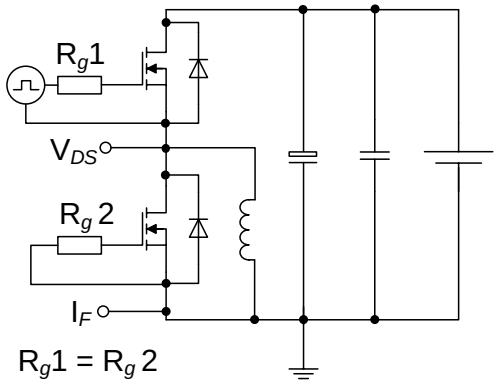
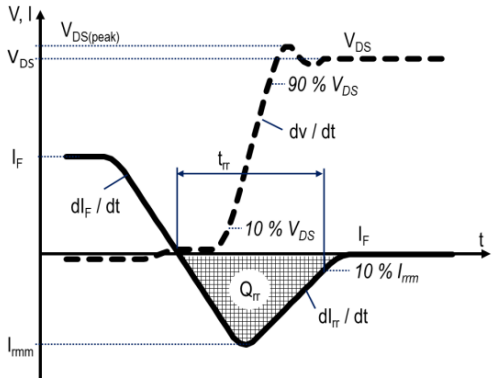
Test circuit for diode characteristics	Diode recovery waveform
	

Table 9 Switching times (ss)

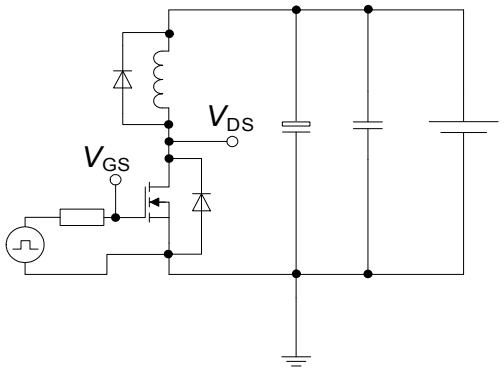
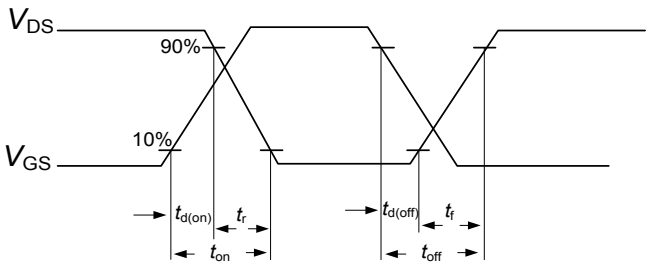
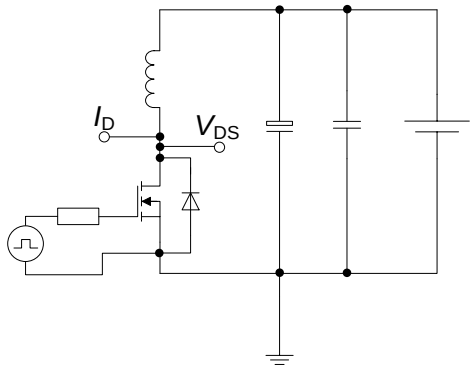
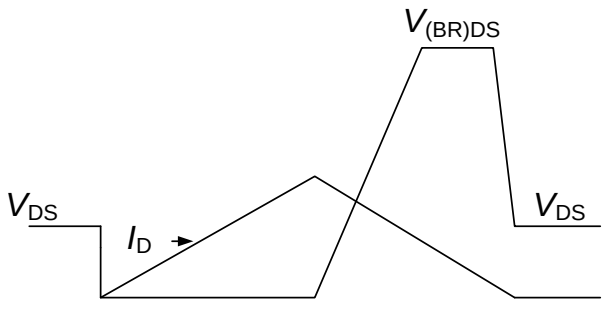
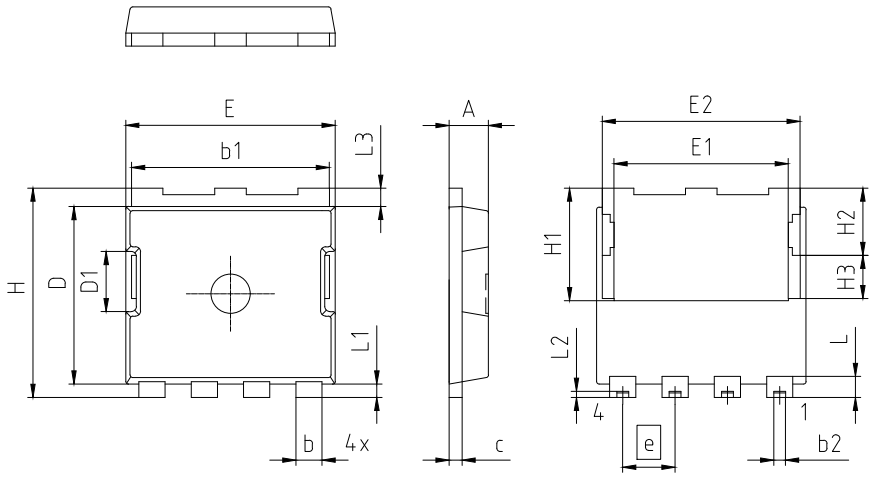
Switching times test circuit for inductive load	Switching times waveform
	

Table 10 Unclamped inductive load (ss)

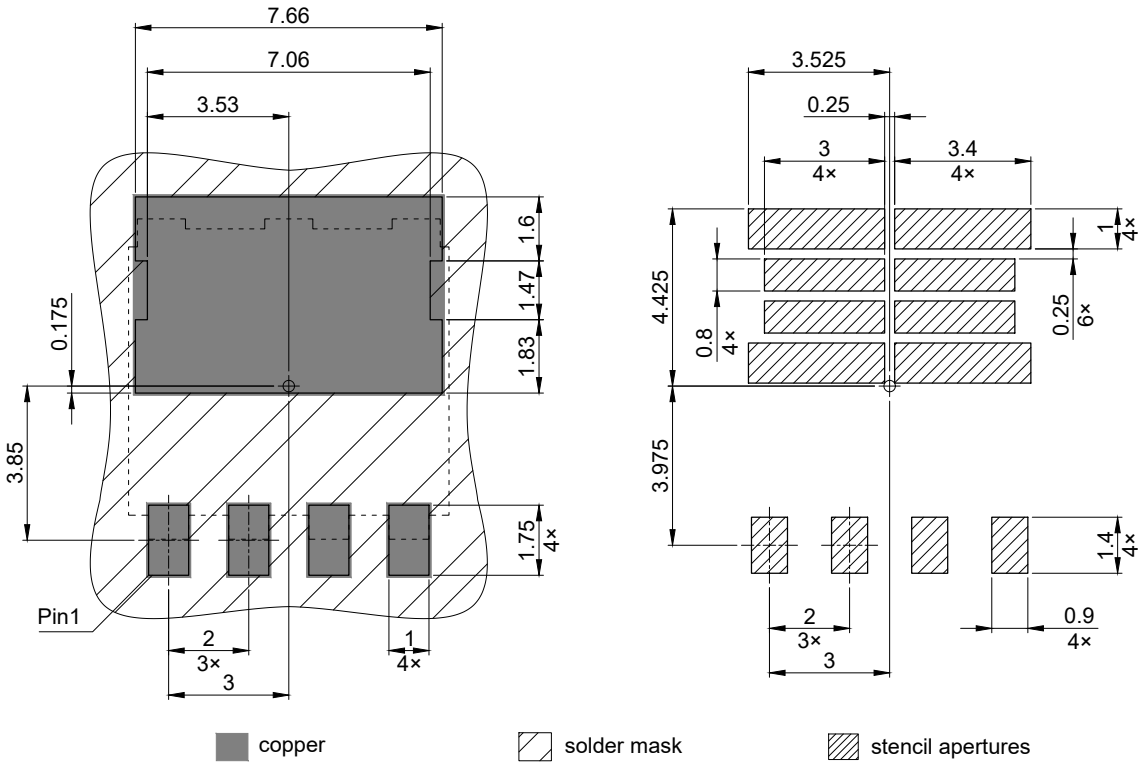
Unclamped inductive load test circuit	Unclamped inductive waveform
	

6 Package outlines



PACKAGE - GROUP NUMBER:	PG-LHSOF-4-U01	
DIMENSIONS	MILLIMETERS	
	MIN.	MAX.
A	1.40	1.60
b	0.90	1.10
b1	7.46	7.66
b2	0.42	0.50
c	0.40	0.60
D	6.59	6.99
D1	2.30	
E	7.80	8.20
E1	6.66	
E2	7.56	
e	2.00	
N	4	
H	7.80	8.20
H1	4.30	
H2	2.57	
H3	1.65	
L	0.50	1.00
L1	0.51	
L2	0.23	
L3	0.50	0.90

Figure 1 Outline PG-LHSOF-4, dimensions in mm



Based on stencil thickness 0.13 mm
All pads are solder mask defined
All dimensions are in units mm

Figure 2 Footprint drawing PG-LHSOF-4, dimensions in mm

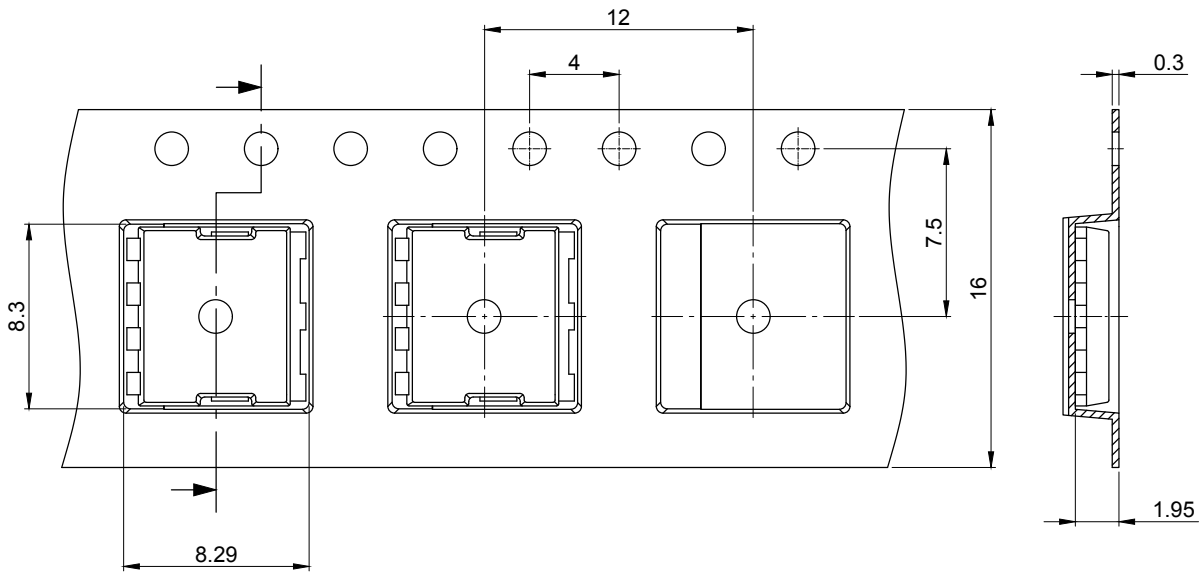


Figure 3 Packaging variant PG-LHSOF-4, dimensions in mm

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

IPTA60R600CM8

Revision 2026-10-11, Rev. 1.1

Previous revisions

Revision	Date	Subjects (major changes since last revision)
1.0	2026-09-29	Release of final version
1.1	2026-10-11	tailored features, benefits and applications

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