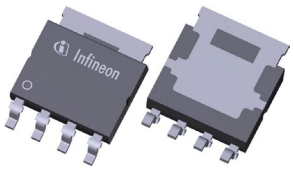
英飞凌汽车级 MOSFET

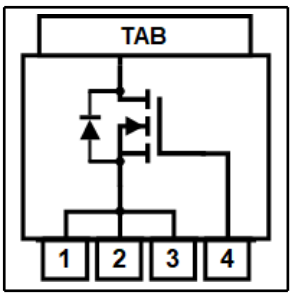
英飞凌OptiMOS™7 功率晶体管

RoHS Infineon Automotive Quality AEC Qualified

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PG-THSOG-4-1





特性

- OptiMOS™适用于汽车应用的 MOSFET
- N 沟道 - 增强型 - 逻辑电平
- 严苛于 AEC-Q101 的扩展认证
- 加强电气测试
- 坚固的设计
- MSL1 回流焊峰值温度高达 260°C
- 工作温度 175°C
- 符合 RoHS 标准
- 100% 雪崩测试

潜在应用

通用汽车应用

产品验证

汽车应用认证。根据 AEC-Q101 进行产品验证。

产品概述

V_{DS}	40	V
$R_{DS(on)}$	4.4	mΩ
I_D (chip limited)	77	A

Type	Package	Marking
IAUCN04S7L042G	PG-THSOG-4-1	7N04L042

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最大额定值

除非另有规定，否则均为 T_j = 25°C

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	V_{GS} = 10 V, Chip limitation[1,2)]	77	A
		V_{GS} = 10 V, DC current	77	
		T_a = 100°C, V_{GS} = 10 V, R_{thJA} on 2s2p[2,3)]	20	
Pulsed drain current[2)]	$I_{D,pulse}$	T_C = 25°C, t_p = 100 µs	165	
Avalanche energy, single pulse[2)]	E_{AS}	I_D = 15 A	42	mJ
Avalanche current, single pulse	I_{AS}	–	30	A
Gate source voltage	V_{GS}	–	±16	V
		Limited to duty factor of 1%	+20	
Power dissipation	P_{tot}	T_C = 25°C	50	W
Operating temperature	T_j	–	-55 ... +175	°C

热特性[2)]

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal resistance, junction - case	R_{thJC}	–	–	–	2.98	K/W
Thermal resistance, junction - ambient[3)]	R_{thJA}	–	–	30.6	–	

电气特性

除非另有规定，T_j = 25°C

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
静态特性						
Drain-source breakdown voltage	$V_{(Br)DSS}$	V_{GS} = 0 V, I_D = 1 mA	40	–	–	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 10 µA	1.2	1.5	1.8	
Zero gate voltage drain current	I_{DSS}	V_{DS} = 40 V, V_{GS} = 0 V, T_j = 25°C	–	–	1	µA
		V_{DS} = 40 V, V_{GS} = 0 V, T_j = 100°C[2)]	–	–	3	
Gate-source leakage current	I_{GSS}	V_{GS} = 20 V, V_{DS} = 0 V	–	–	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS} = 4.5 V, I_D = 39 A	–	5.7	6.6	mΩ
		V_{GS} = 10 V, I_D = 39 A	–	3.9	4.4	
Gate resistance[2)]	R_G	–	–	1.5	–	Ω

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
动态特性[2)]						
Input capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 20 V, f = 1 MHz	–	902	1173	pF
Output capacitance	C_{oss}		–	395	514	
Reverse transfer capacitance	C_{rss}		–	25	38	
Turn-on delay time	$t_{d(on)}$	V_{DD} = 20 V, V_{GS} = 10 V, I_D = 39 A, R_G = 3.5 Ω	–	2.7	–	ns
Rise time	t_r		–	7.7	–	
Turn-off delay time	$t_{d(off)}$		–	11.4	–	
Fall time	t_f		–	15.6	–	
栅极电荷特性[2)]						
Gate to source charge	Q_{gs}	V_{DD} = 20 V, I_D = 39 A, V_{GS} = 0 to 10 V	–	2.8	3.6	nC
Gate to drain charge	Q_{gd}		–	2.7	4.1	
Gate charge total	Q_g		–	15.0	19.5	
Gate plateau voltage	$V_{plateau}$		–	3.1	–	V
反向二极管						
Diode continuous forward current[2)]	I_S	T_C = 25°C	–	–	77	A
Diode pulse current[2)]	$I_{S,pulse}$	T_C = 25°C, t_p = 100 µs	–	–	165	
Diode forward voltage	V_{SD}	V_{GS} = 0 V, I_F = 39 A, T_j = 25°C	–	0.85	1	V
Reverse recovery time[2)]	t_{rr}	V_R = 20 V, I_F = 50 A, di_F/dt = 100 A/µs	–	10	15	ns
Reverse recovery charge[2)]	Q_{rr}		–	1.2	2.4	nC

[1)] 实际上，电流能力受到包括客户特定的印刷电路板在内的整体系统设计的限制。

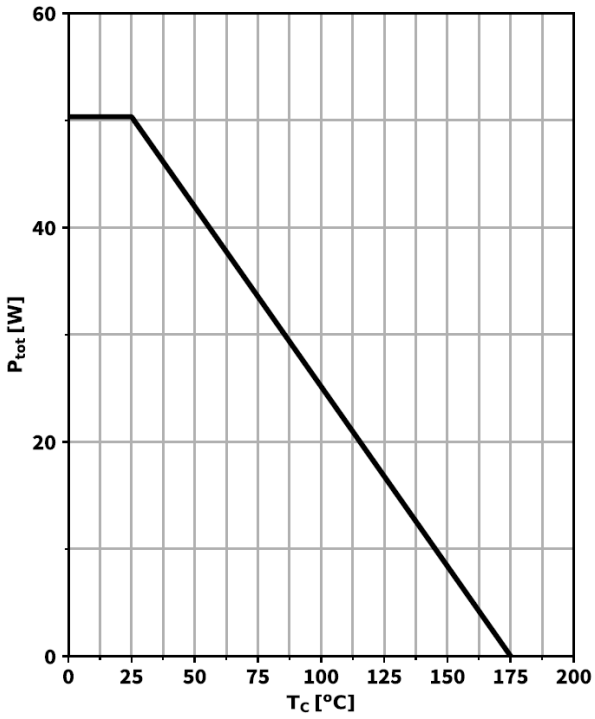
[2)] 该参数不受制于生产测试 – 由设计标定。

[3)] 器件放置于根据 JEDEC 标准 (JESD51-5, -7) 定义的 2s2p FR4 印刷电路板上。印刷电路板垂直放置在静止空气中。

电气特性图

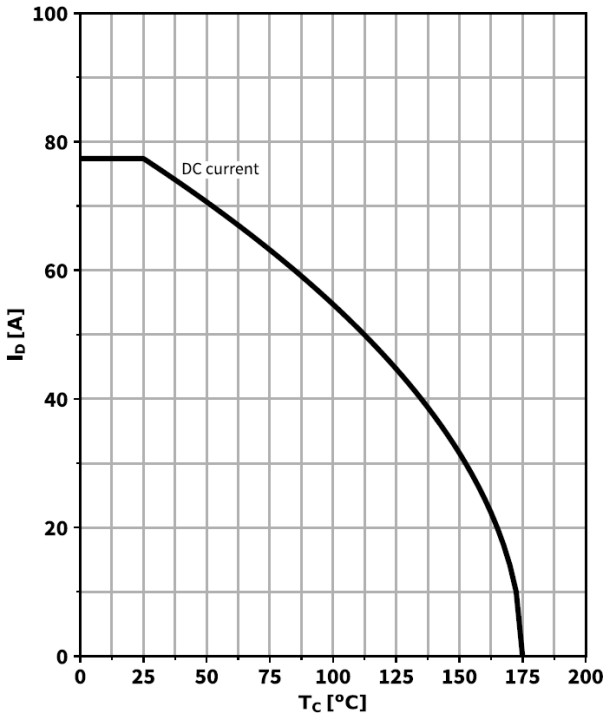
1 Power dissipation

$P_{tot} = f(T_C); V_{GS} \geq 6\ V$



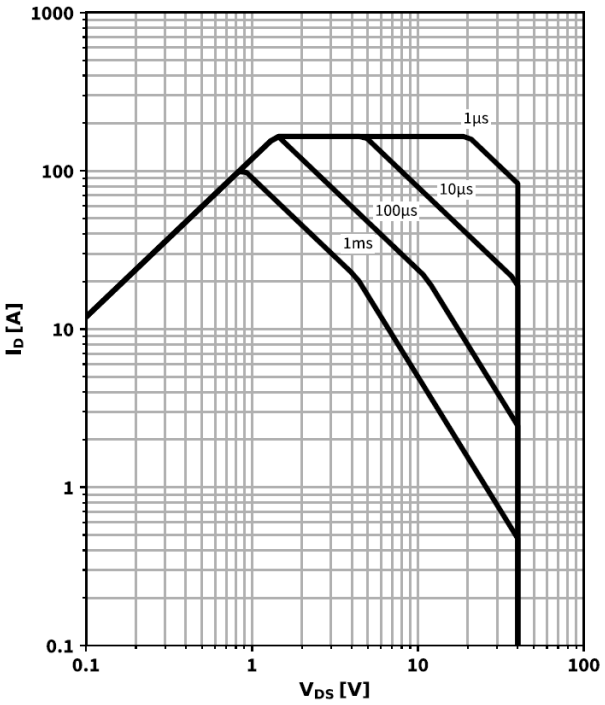
2 Drain current

$I_D = f(T_C); V_{GS} \geq 6\ V$



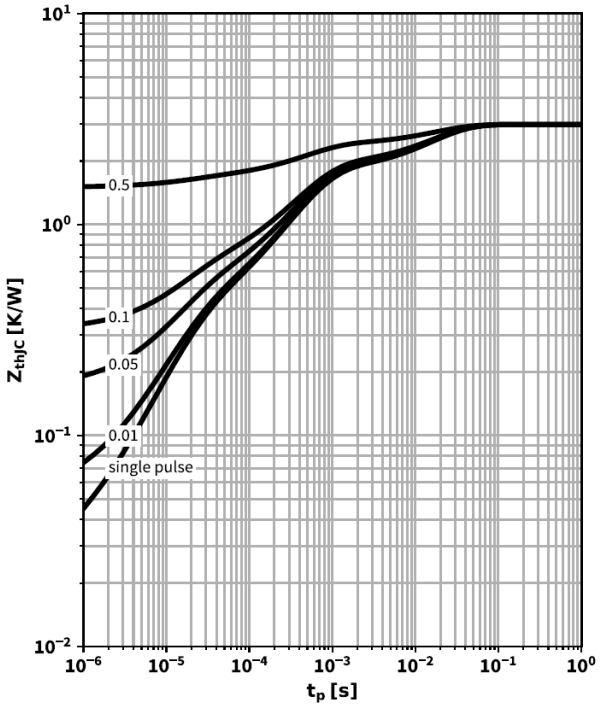
3 Safe operating area

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



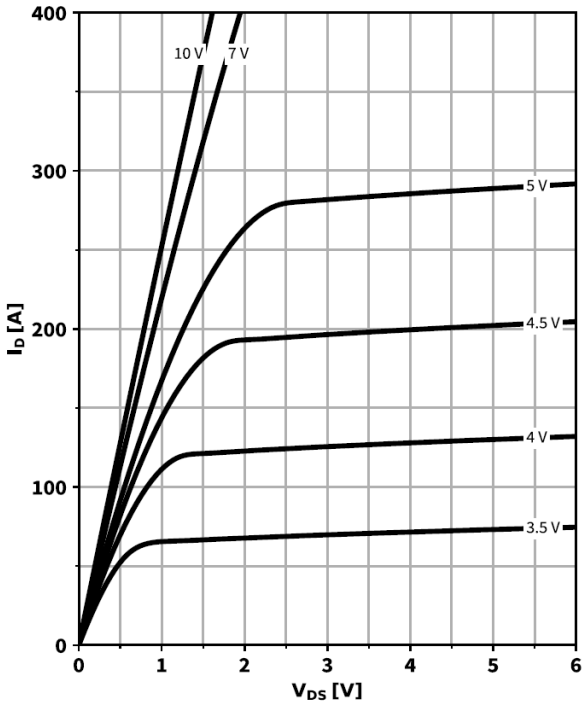
4 Max. transient thermal impedance

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



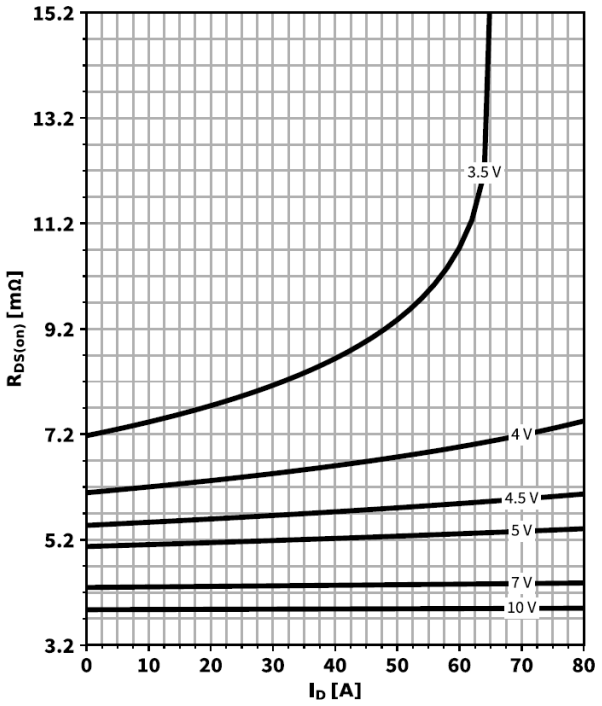
5 Typ. output characteristics

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



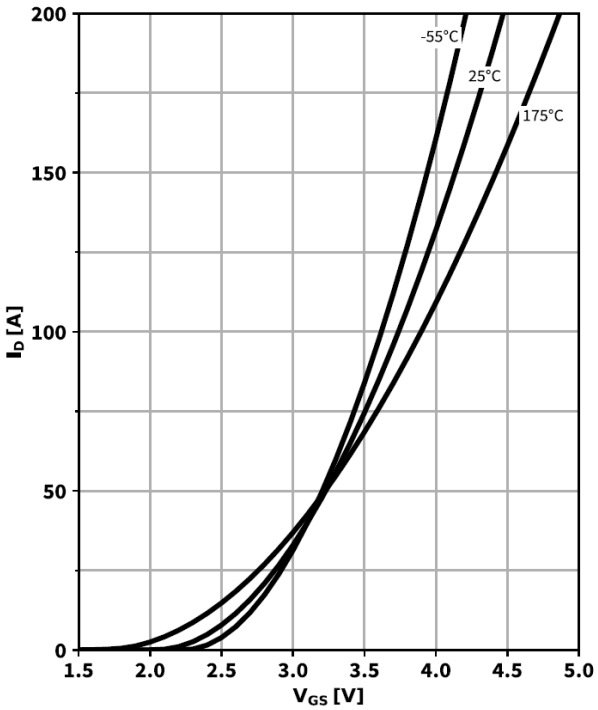
6 Typ. drain-source on-state resistance

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



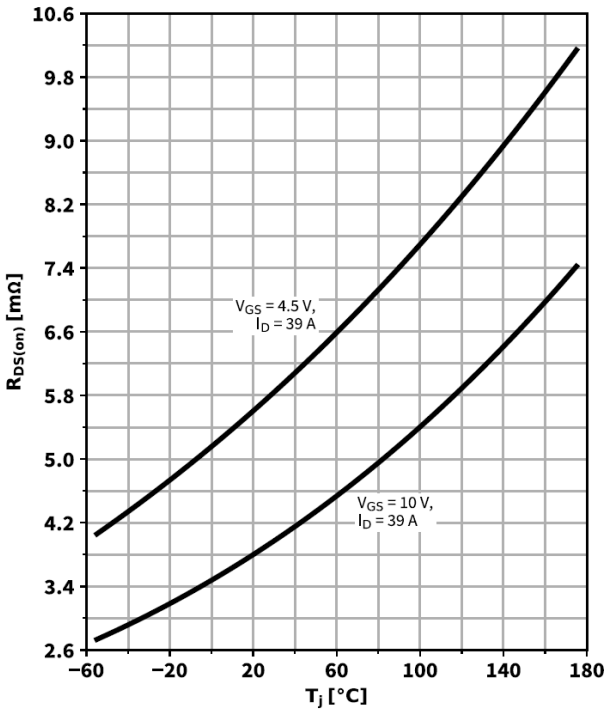
7 Typ. transfer characteristics

$I_D = f(V_{GS})$; $V_{DS} = 6$ V; parameter: T_j



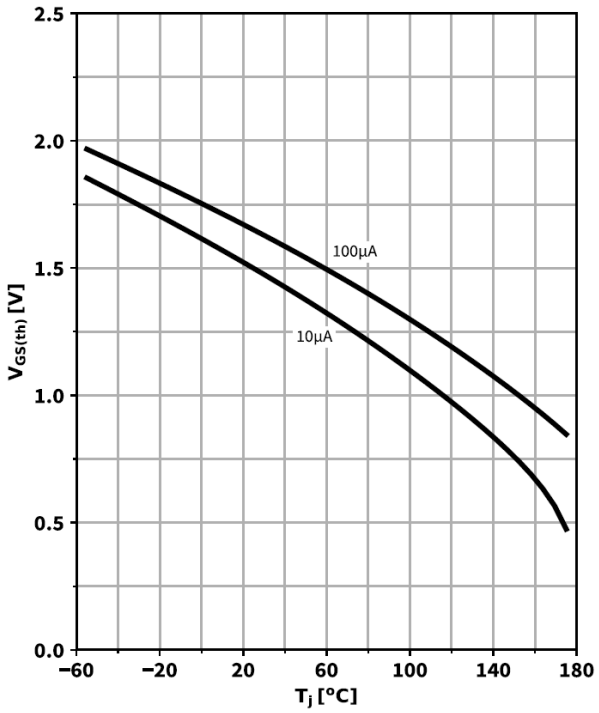
8 Typ. drain-source on-state resistance

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



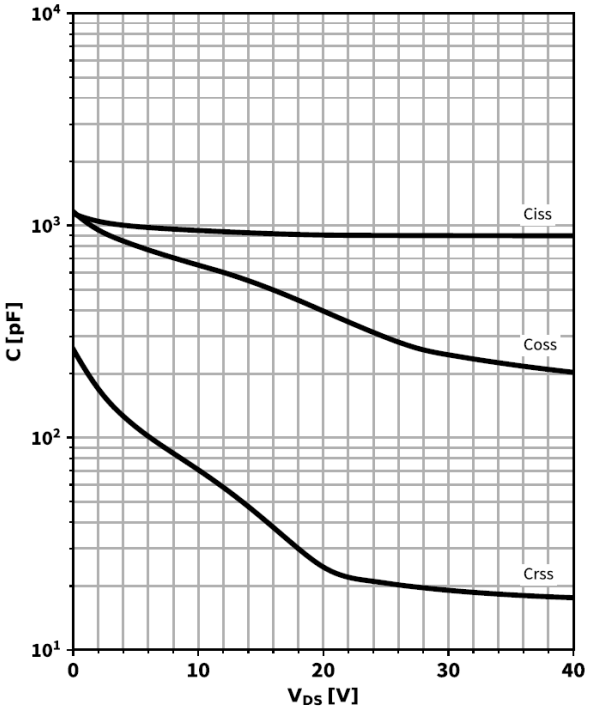
9 Typ. gate threshold voltage

$V_{GS(th)} = f(T_j)$; $V_{GS} = V_{DS}$; parameter: I_D



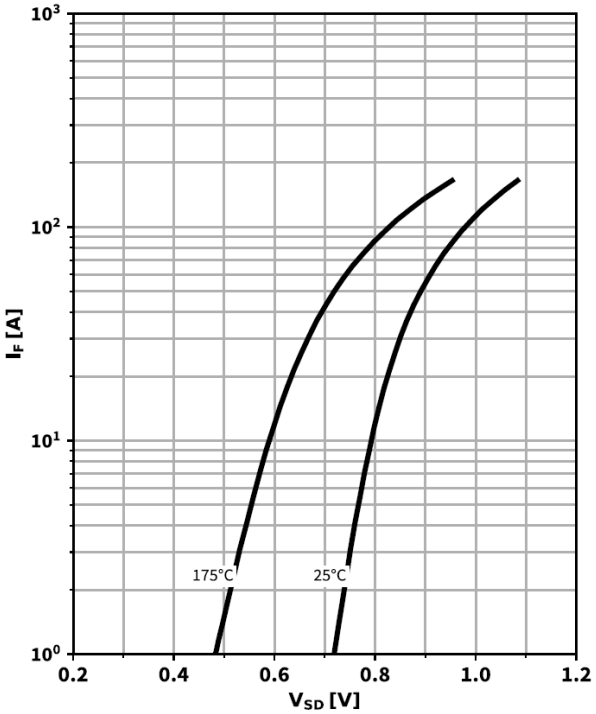
10 Typ. capacitances

$C = f(V_{DS})$; $V_{GS} = 0$ V; $f = 1$ MHz



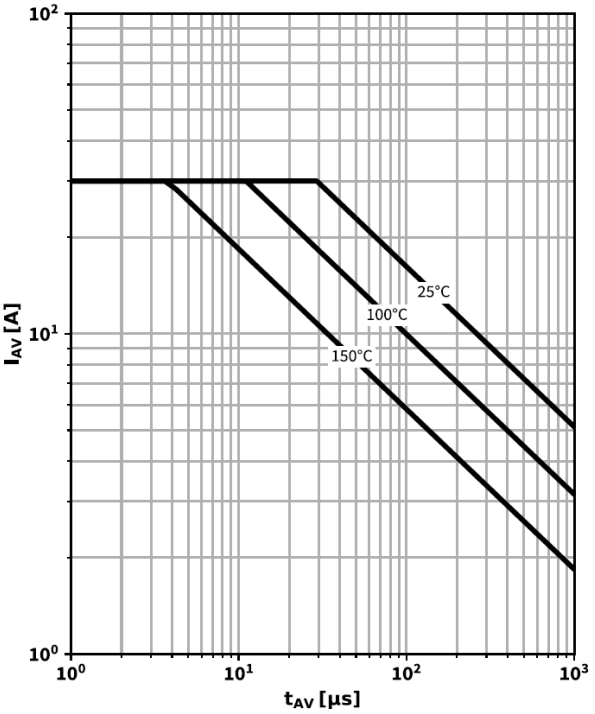
11 Typ. forward diode characteristics

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



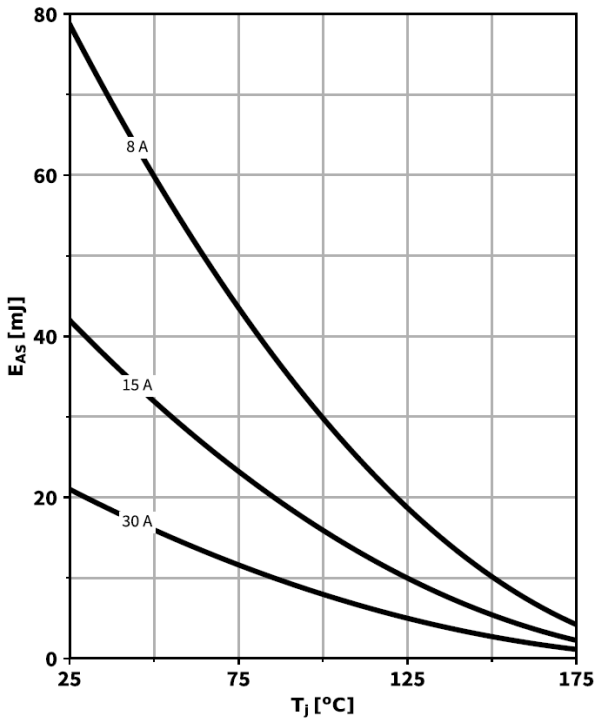
12 Typ. avalanche characteristics

$I_{AS} = f(t_{AV})$; parameter: $T_{j(start)}$



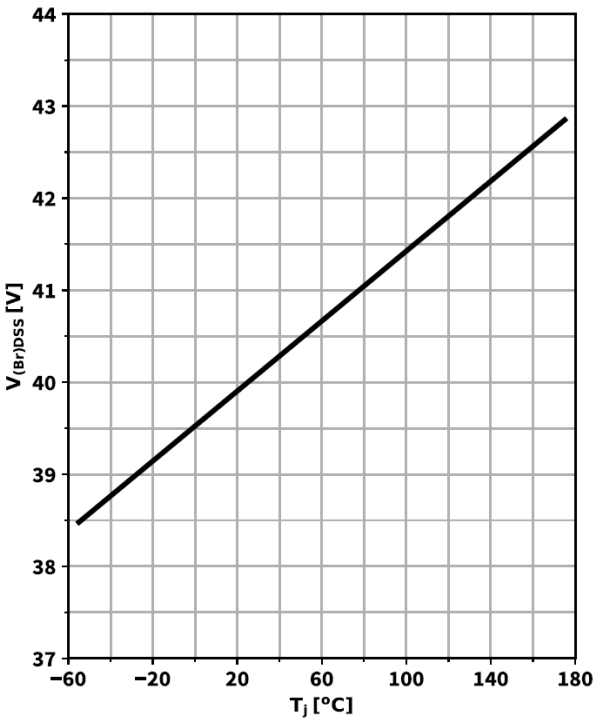
13 Typical avalanche energy

$E_{AS} = f(T_j)$; parameter: I_D



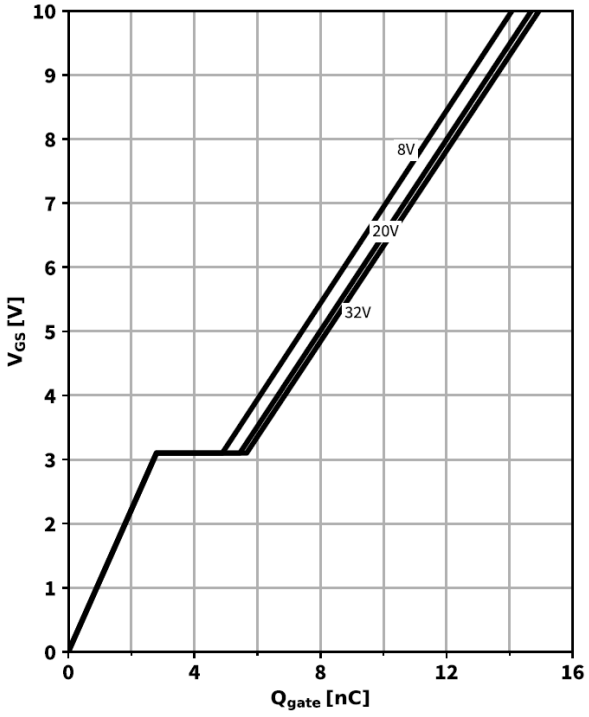
14 Drain-source breakdown voltage

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

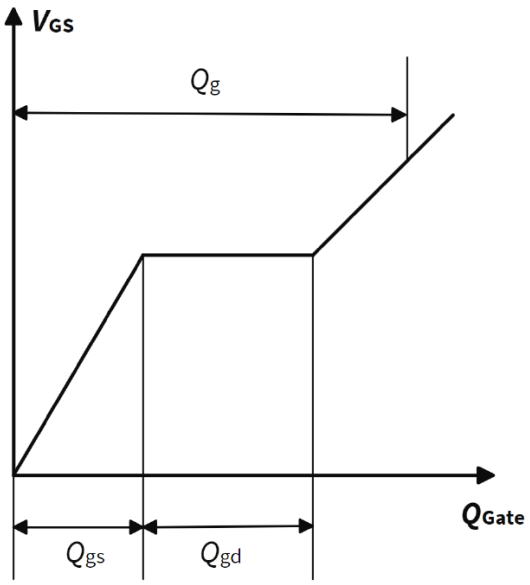


15 Typ. gate charge

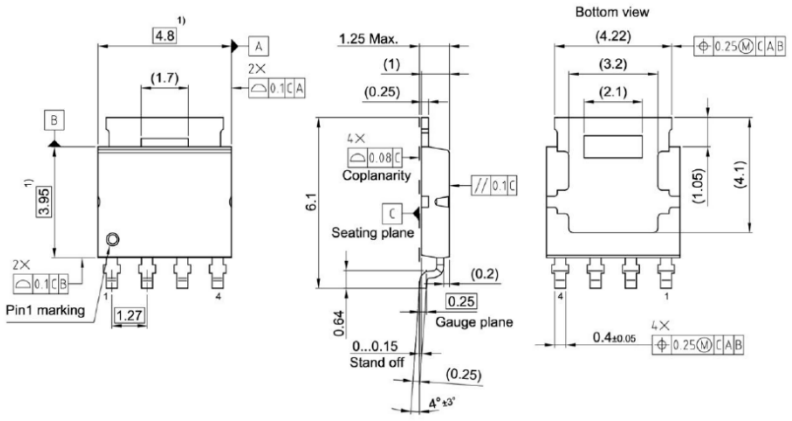
$V_{GS} = f(Q_{gate})$; $I_D = 40$ A pulsed; parameter: V_{DD}



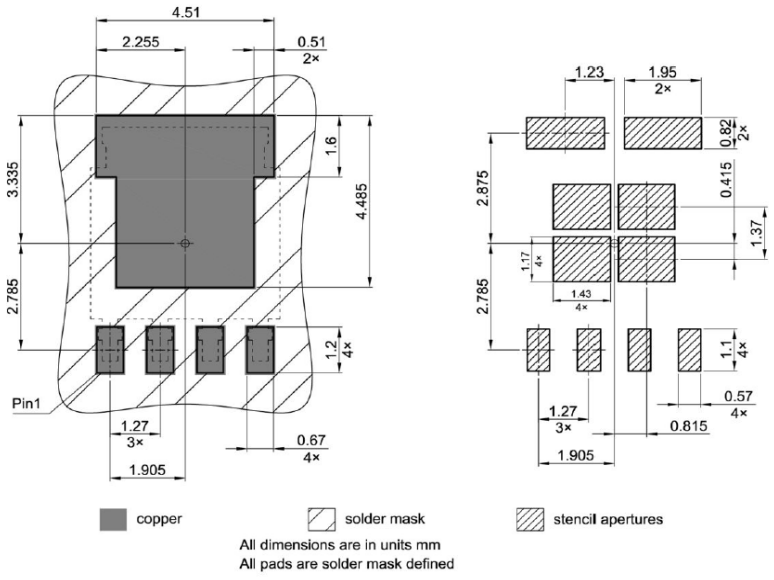
16 Gate charge waveforms



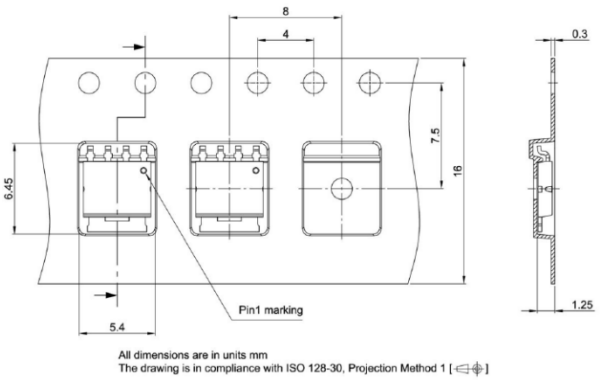
封装外形


Bottom view
1.25 Max.
Coplanarity
Seating plane
Gauge plane
Stand off
Pin1 marking
1) Does not include plastic protrusion which shall not exceed 0.15mm max. per side.
2) Dambar protrusion shall be maximum 0.170mm per side.
3) All metal surfaces are plated,except area of cut.
All dimensions are in units mm
The drawing is in compliance with ISO 128-30, Projection Method 1 [
Drawing according to ISO 8015, general tolerances ±0.1;±1°

焊盘图


Pin1
copper
solder mask
stencil apertures
All dimensions are in units mm
All pads are solder mask defined

封装


Pin1 marking
All dimensions are in units mm
The drawing is in compliance with ISO 128-30, Projection Method 1 [

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Revision	Date	Changes
Revision 1.0	2025-12-09	Final Data Sheet

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