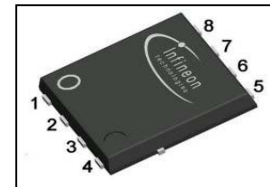


OptiMOS[®] 2 Power-Transistor
Features

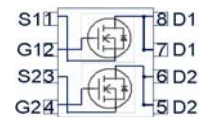
- Dual N-channel, normal level
- Excellent gate charge x $R_{DS(on)}$ product (FOM)
- Low on-resistance $R_{DS(on)}$
- Pb-free lead plating; RoHS compliant
- Qualified according to JEDEC¹⁾ for target application
- Ideal for high-frequency switching and synchronous rectification
- 100% avalanche tested

Product Summary

V_{DS}	100	V
$R_{DS(on),max}$	75	m Ω
I_D	13	A

PG-TDSON-8


Type	Package	Marking
BSC750N10ND G	PG-TDSON-8	750N10ND


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

Parameter	Symbol	Conditions	Value		Unit
			≤ 10 secs	steady state	
Continuous drain current	I_D	$V_{GS}=10\text{ V}, T_C=25\text{ }^\circ\text{C}$	13		A
		$V_{GS}=10\text{ V}, T_C=100\text{ }^\circ\text{C}$	8.5		
		$V_{GS}=10\text{ V}, T_A=25\text{ }^\circ\text{C}^{3)}$	5.0	3.2	
Pulsed drain current ²⁾	$I_{D,pulse}$	$T_C=25\text{ }^\circ\text{C}$	52		
Avalanche energy, single pulse	E_{AS}	$I_D=13\text{ A}, R_{GS}=25\text{ }\Omega$	17		mJ
Reverse diode dv/dt	dv/dt	$I_D=13\text{ A}, V_{DS}=80\text{ V}, di/dt=100\text{ A}/\mu\text{s}, T_{j,max}=150\text{ }^\circ\text{C}$	6		kV/ μs
Gate source voltage	V_{GS}		± 20		V
Power dissipation	P_{tot}	$T_C=25\text{ }^\circ\text{C}$	26		W
		$T_A=25\text{ }^\circ\text{C}^{3)}$	3.6	1.5	
Operating and storage temperature	T_j, T_{stg}		-55 ... 150		$^\circ\text{C}$
IEC climatic category; DIN IEC 68-1			55/150/56		

¹⁾ J-STD20 and JESD22

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Thermal characteristics

Thermal resistance, junction - case	R_{thJC}		-	-	4.9	K/W
Thermal resistance, junction - ambient, 6 cm ² cooling area ³⁾	R_{thJA}	$t \leq 10$ s	-	-	35	
		steady state	-	-	85	

Electrical characteristics, at $T_j=25$ °C, unless otherwise specified
Static characteristics

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0$ V, $I_D=1$ mA	100	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=12$ μ A	2	3	4	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=100$ V, $V_{GS}=0$ V, $T_j=25$ °C	-	0.1	1	μ A
		$V_{DS}=100$ V, $V_{GS}=0$ V, $T_j=125$ °C	-	10	100	
Gate-source leakage current	I_{GSS}	$V_{GS}=20$ V, $V_{DS}=0$ V	-	1	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10$ V, $I_D=13$ A	-	62	75	m Ω
Gate resistance	R_G		-	0.8	-	Ω
Transconductance	g_{fs}	$ V_{DS} > 2 I_D R_{DS(on)max}$, $I_D=13$ A	6.5	13	-	S

²⁾ See figure 3

³⁾ Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm² (one layer, 70 μ m thick) copper area for drain connection. PCB is vertical in still air. One transistor active.

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Dynamic characteristics

Input capacitance	C_{iss}	$V_{GS}=0\text{ V}, V_{DS}=50\text{ V},$ $f=1\text{ MHz}$	-	540	720	pF
Output capacitance	C_{oss}		-	76	100	
Reverse transfer capacitance	C_{rss}		-	8	12	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=50\text{ V}, V_{GS}=10\text{ V},$ $I_D=13\text{ A}, R_G=2.4\ \Omega$	-	9	13	ns
Rise time	t_r		-	4	6	
Turn-off delay time	$t_{d(off)}$		-	13	18	
Fall time	t_f		-	3	4	

Gate Charge Characteristics⁴⁾

Gate to source charge	Q_{gs}	$V_{DD}=50\text{ V}, I_D=13\text{ A},$ $V_{GS}=0\text{ to }10\text{ V}$	-	3	4	nC
Gate to drain charge	Q_{gd}		-	2	3	
Switching charge	Q_{sw}		-	4	6	
Gate charge total	Q_g		-	8	11	
Gate plateau voltage	$V_{plateau}$		-	6	-	V
Output charge	Q_{oss}	$V_{DD}=50\text{ V}, V_{GS}=0\text{ V}$	-	8	10	

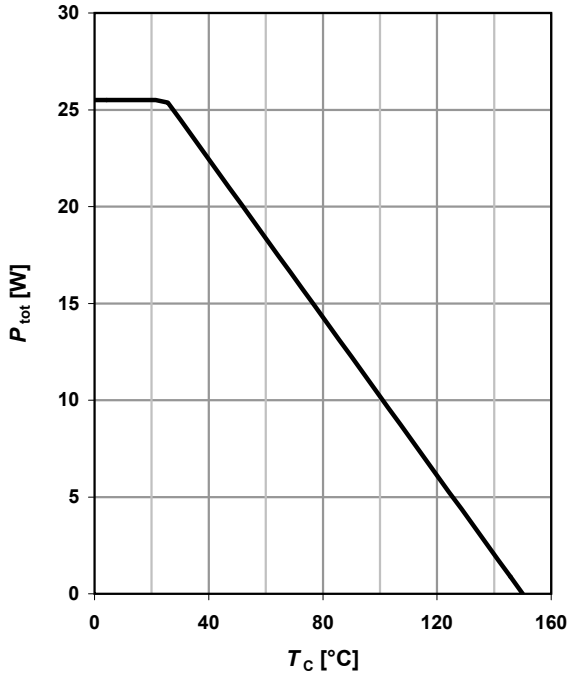
Reverse Diode

Diode continuous forward current	I_S	$T_C=25\text{ }^\circ\text{C}$	-	-	13	A
Diode pulse current	$I_{S,pulse}$		-	-	52	
Diode forward voltage	V_{SD}	$V_{GS}=0\text{ V}, I_F=13\text{ A},$ $T_j=25\text{ }^\circ\text{C}$	-	1	1.2	V
Reverse recovery time	t_{rr}	$V_R=50\text{ V}, I_F=I_S,$ $di_F/dt=100\text{ A}/\mu\text{s}$	-	67		ns
Reverse recovery charge	Q_{rr}		-	114	-	nC

⁴⁾ See figure 16 for gate charge parameter definition

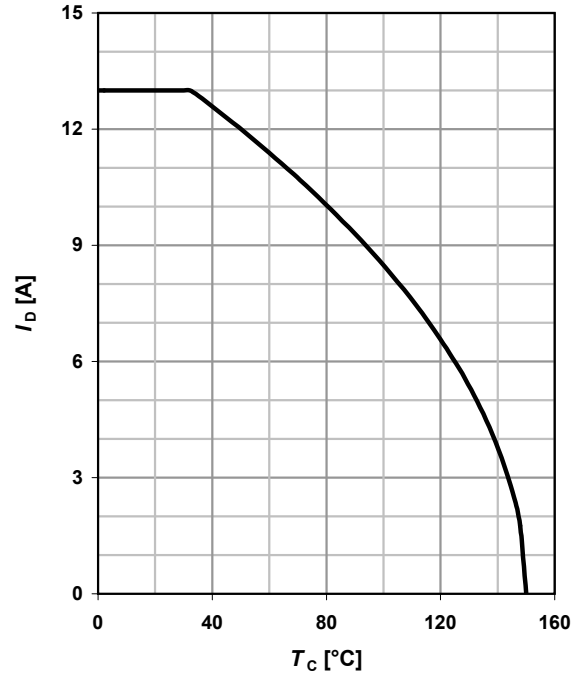
1 Power dissipation

$P_{tot}=f(T_C)$



2 Drain current

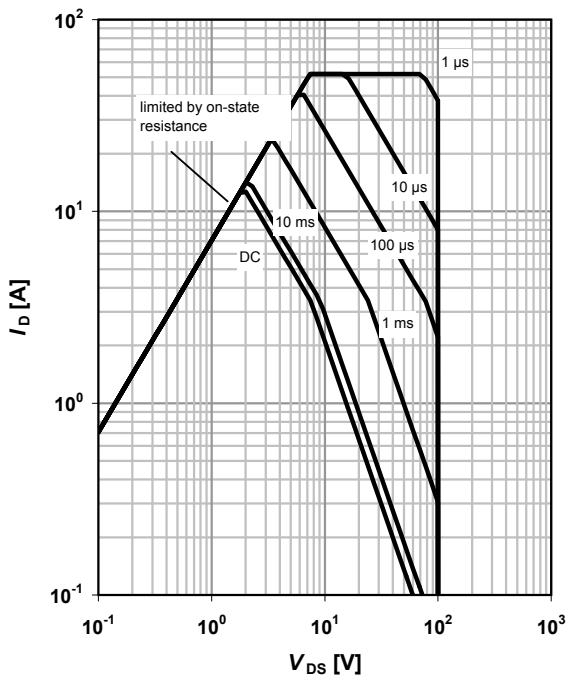
$I_D=f(T_C); V_{GS} \geq 10\text{ V}$



3 Safe operating area

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

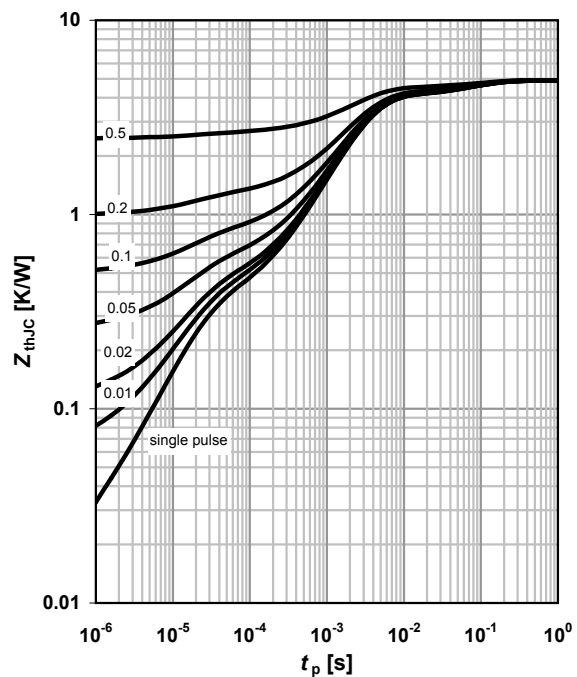
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJC}=f(t_p)$

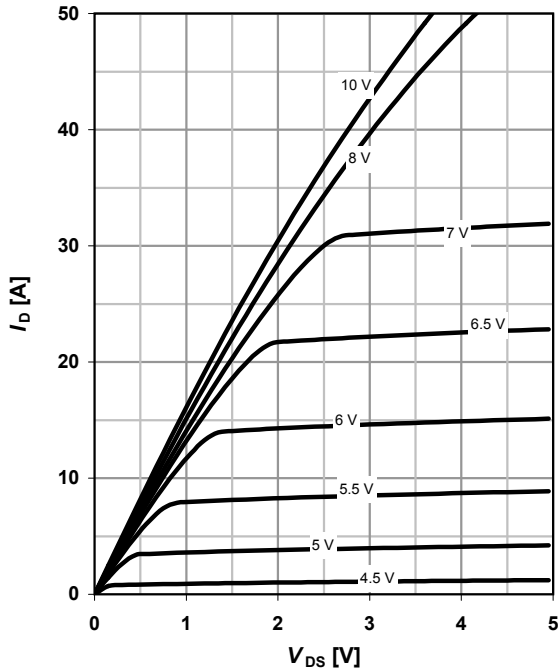
parameter: $D=t_p/T$



5 Typ. output characteristics

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

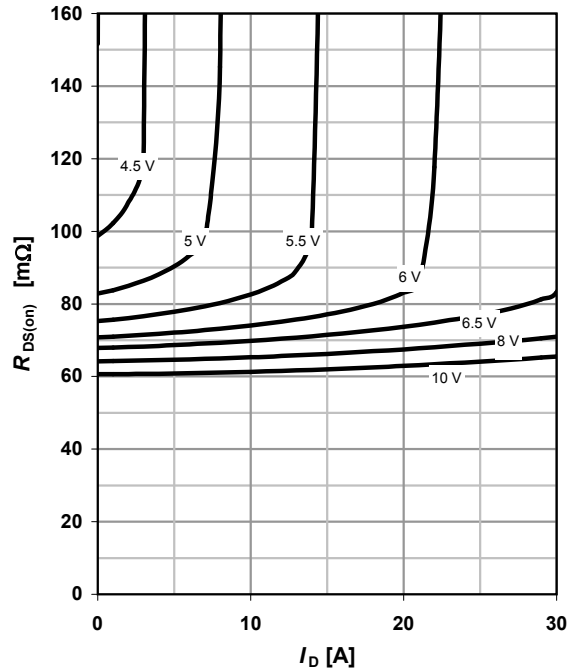
parameter: V_{GS}



6 Typ. drain-source on resistance

$R_{DS(on)} = f(I_D); T_j = 25\text{ }^\circ\text{C}$

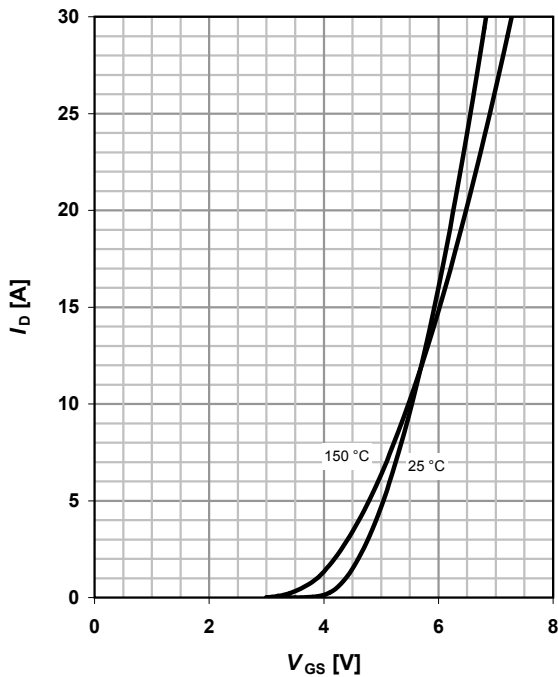
parameter: V_{GS}



7 Typ. transfer characteristics

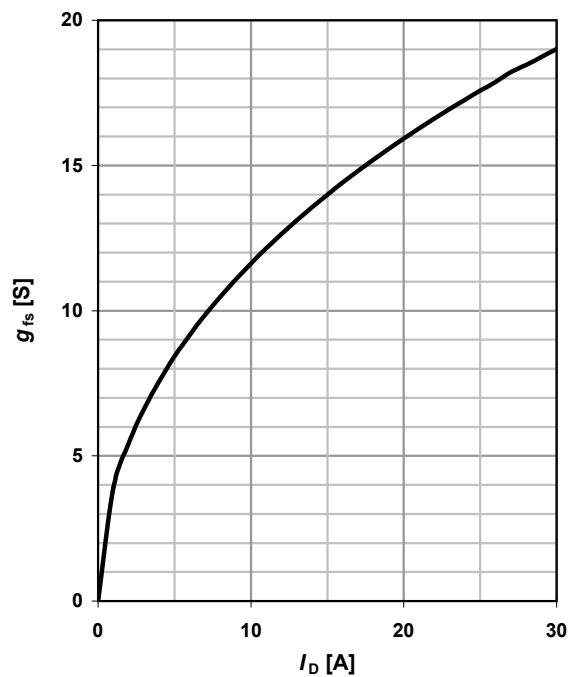
$I_D = f(V_{GS}); |V_{DS}| > 2|I_D|R_{DS(on)max}$

parameter: T_j



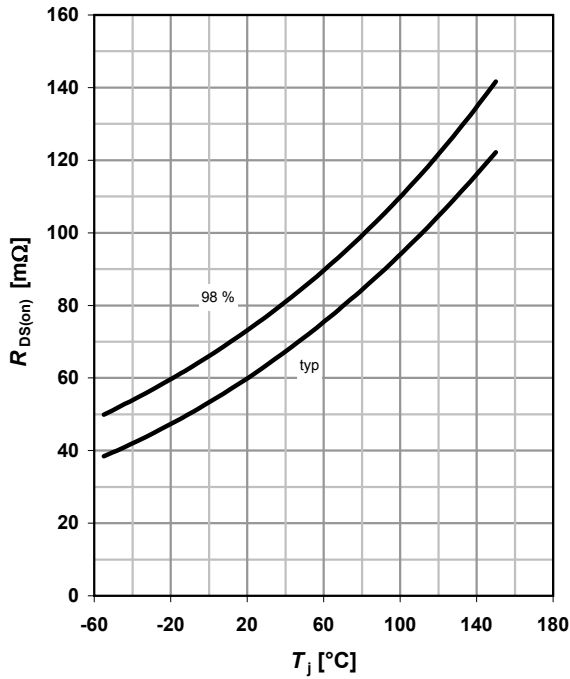
8 Typ. forward transconductance

$g_{fs} = f(I_D); T_j = 25\text{ }^\circ\text{C}$



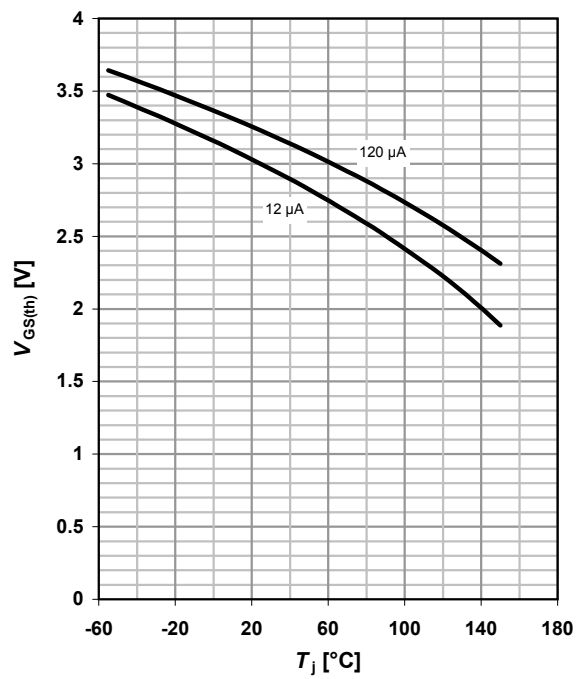
9 Drain-source on-state resistance

$R_{DS(on)} = f(T_j); I_D = 13 \text{ A}; V_{GS} = 10 \text{ V}$



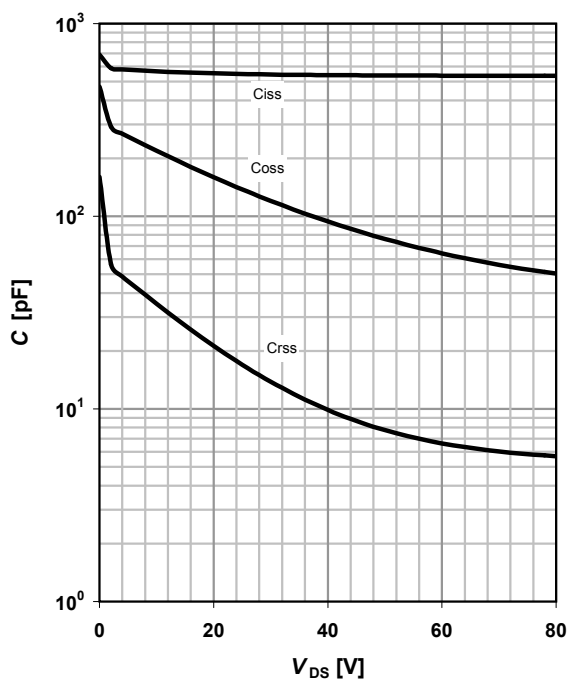
10 Typ. gate threshold voltage

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



11 Typ. capacitances

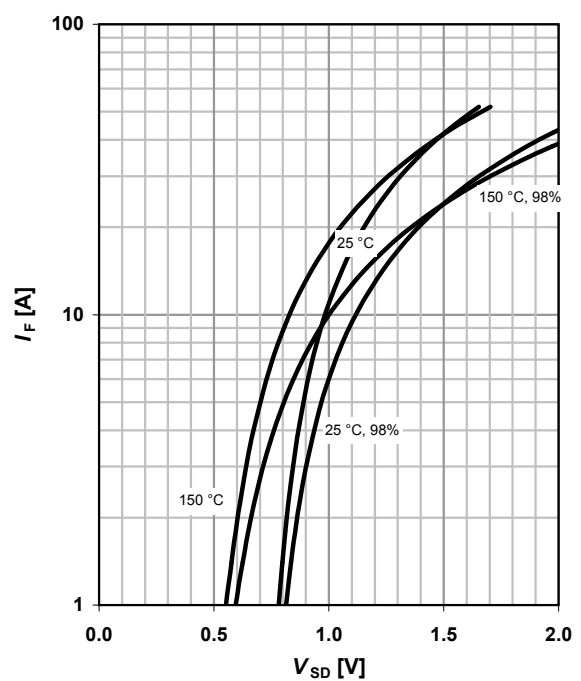
$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}$



12 Forward characteristics of reverse diode

$I_F = f(V_{SD})$

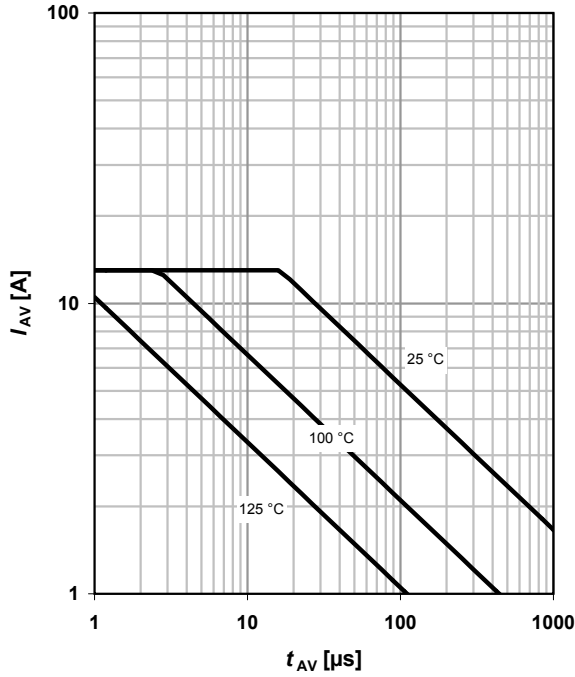
parameter: T_j



13 Avalanche characteristics

$I_{AS}=f(t_{AV}); R_{GS}=25 \Omega$

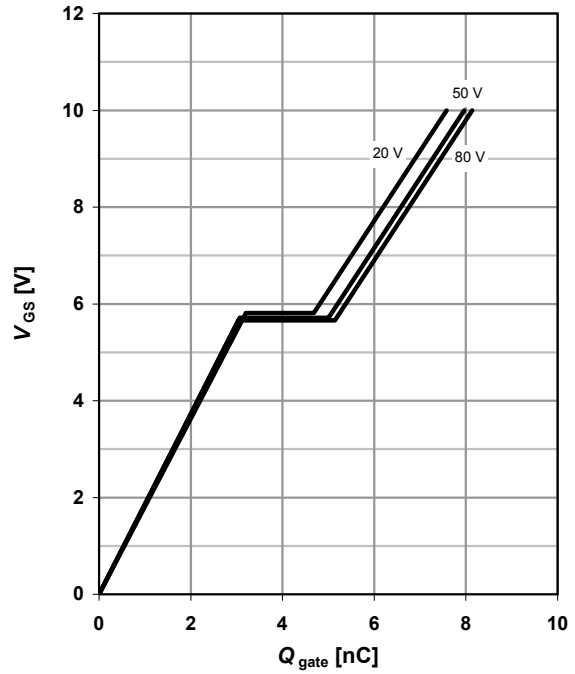
parameter: $T_{j(start)}$



14 Typ. gate charge

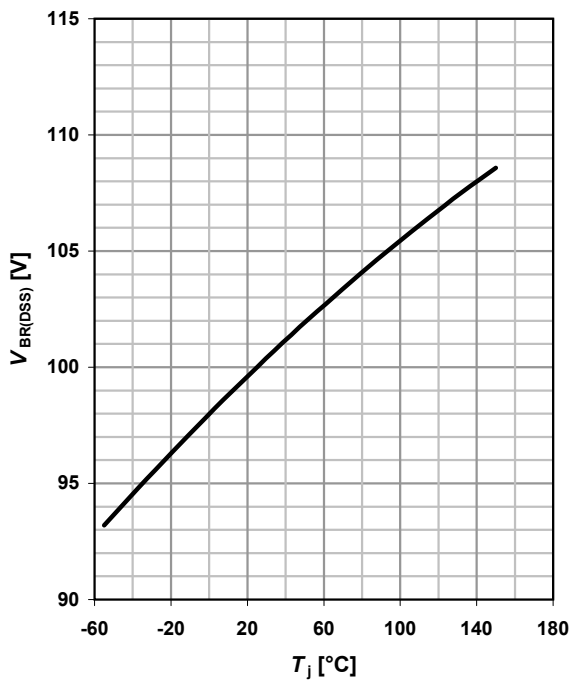
$V_{GS}=f(Q_{gate}); I_D=13 \text{ A pulsed}$

parameter: V_{DD}



15 Drain-source breakdown voltage

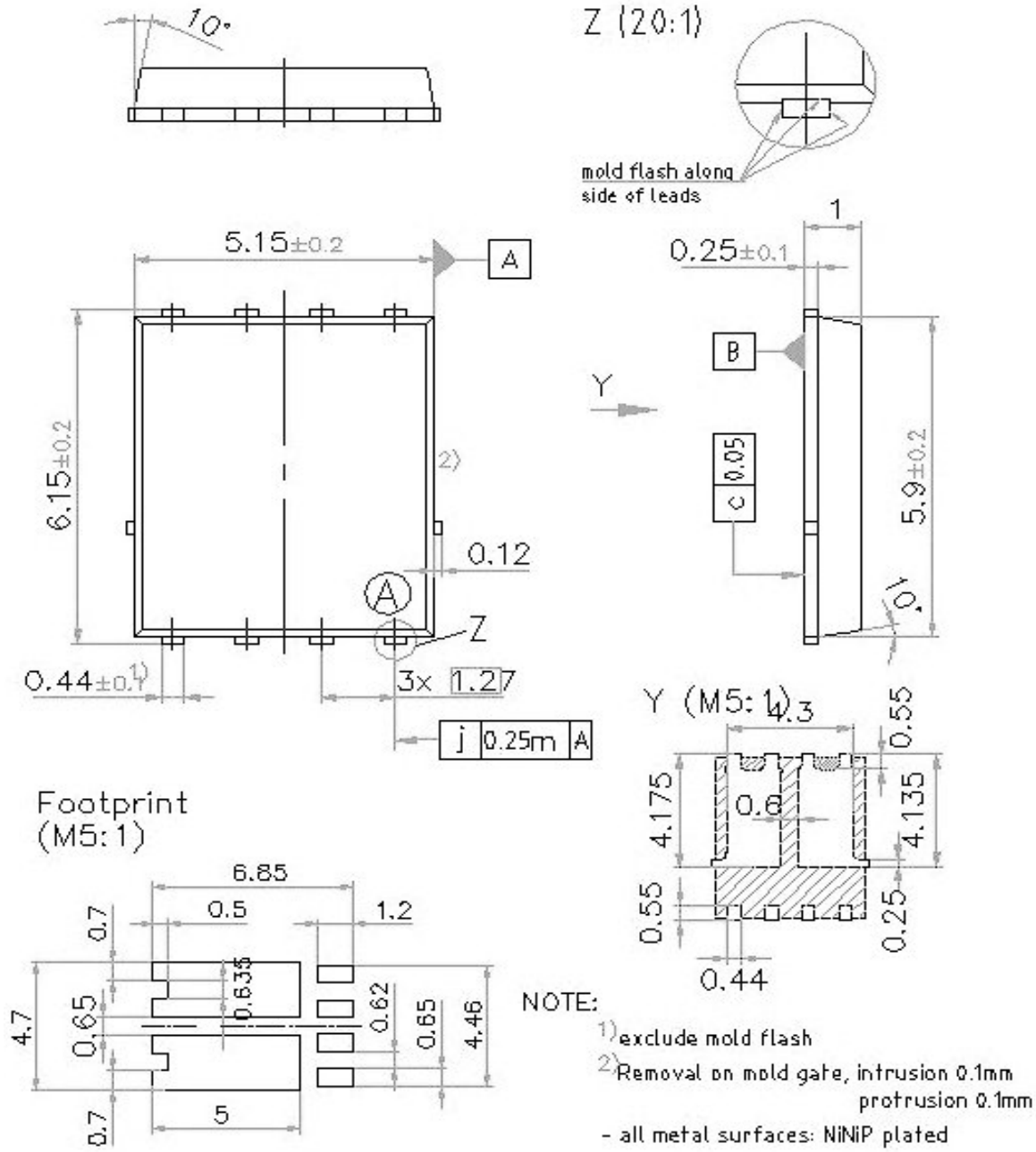
$V_{BR(DSS)}=f(T_j); I_D=1 \text{ mA}$



16 Gate charge waveforms



Package Outline and Footprint PG-TDSON-8 dual



Dimensions in mm

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