THE DATASHEET OF

BSP615S2L

OptiMOS® Power-Transistor

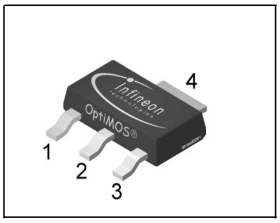
Feature

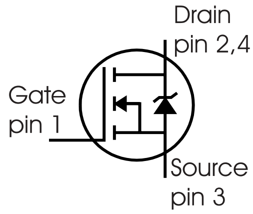
- N-Channel
- Enhancement mode
- Logic Level

Product Summary

V_{DS}	55	V
$R_{DS(on)}$	90	mΩ
I_D	2.8	A

SOT 223





Type	Package	Ordering Code	Marking
BSP615S2L	SOT 223	Q67060-S7211	2N615L

Maximum Ratings, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Value	Unit
Continuous drain current	I_D		A
T_A=25°C		2.8	
T_A=70°C		2.3	
Pulsed drain current T_A=25°C	$I_{D\ puls}$	11	
Gate source voltage	V_{GS}	± 20	V
Power dissipation T_A=25°C	P_{tot}	1.8	W
Operating and storage temperature	T_j , T_{stg}	-55... +150	°C
IEC climatic category; DIN IEC 68-1		55/150/00	

Thermal Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Thermal resistance, junction - soldering point (Pin 4)	R_{thJS}	-	19	23	K/W
Thermal resistance, chip to ambient air:	R_{thJA}				
@ min. footprint		-	-	120	
@ 6 cm^2 cooling area [1)]		-	-	70	

Electrical Characteristics, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Drain-source breakdown voltage V_{GS}=0V, I_D=1mA	$V_{(BR)DSS}$	55	-	-	V
Gate threshold voltage, V_{GS} = V_{DS} I_D=12µA	$V_{GS(th)}$	1.2	1.6	2	
Zero gate voltage drain current	I_{DSS}				µA
V_{DS}=55V, V_{GS}=0V, T_j=25°C		-	0.1	1	
V_{DS}=55V, V_{GS}=0V, T_j=125°C[2)]		-	10	100	
Gate-source leakage current V_{GS}=20V, V_{DS}=0V	I_{GSS}	-	10	100	nA
Drain-source on-state resistance V_{GS}=4.5V, I_D=1.4A	$R_{DS(on)}$	-	86	150	mΩ
Drain-source on-state resistance V_{GS}=10V, I_D=1.4A	$R_{DS(on)}$	-	67	90	

[1]Device on 40mm*40mm*1.5mm epoxy PCB FR4 with 6cm² (one layer, 70 µm thick) copper area for drain connection. PCB is vertical without blown air.

[2]Defined by design. Not subject to production test.

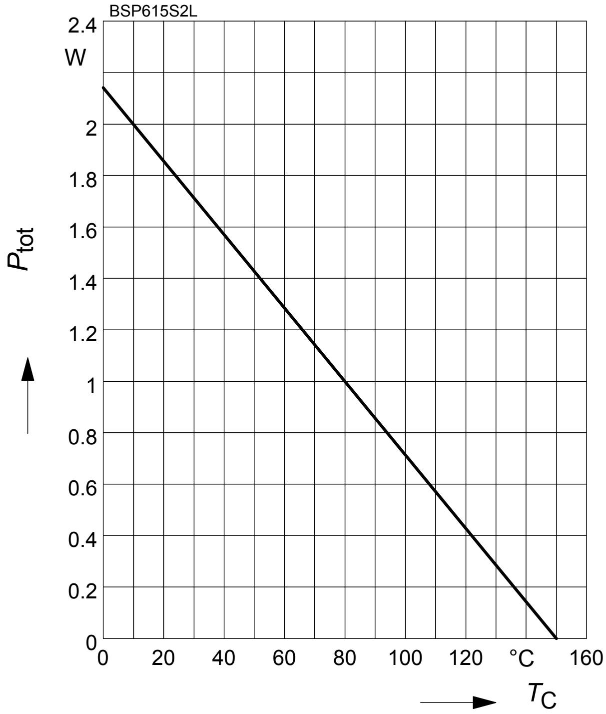
Electrical Characteristics

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic Characteristics						
Transconductance	g_{fs}	V_{DS}≥2*I_D*$R_{DS(on)max}$, I_D=2.3A	2.7	5.4	-	S
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz	-	249	330	pF
Output capacitance	C_{oss}		-	58	78	
Reverse transfer capacitance	C_{rss}		-	22	33	
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V, V_{GS}=4.5V, I_D=2.8A, R_G=24Ω	-	7.8	12	ns
Rise time	t_r		-	24	36	
Turn-off delay time	$t_{d(off)}$		-	22	33	
Fall time	t_f		-	23	34	
Gate Charge Characteristics						
Gate to source charge	Q_{gs}	V_{DD}=40V, I_D=2.8A	-	0.8	1.1	nC
Gate to drain charge	Q_{gd}		-	2.5	3.8	
Gate charge total	Q_g	V_{DD}=40V, I_D=2.8A, V_{GS}=0 to 10V	-	7.5	10	
Gate plateau voltage	$V_{(plateau)}$	V_{DD}=40V, I_D=2.8A	-	3	-	V
Reverse Diode						
Inverse diode continuous forward current	I_S	T_A=25°C	-	-	2.8	A
Inv. diode direct current, pulsed	I_{SM}		-	-	11	
Inverse diode forward voltage	V_{SD}	V_{GS}=0V, I_F=2.8A	-	0.8	1.1	V
Reverse recovery time	t_{rr}	V_R=30V, I_F=I_S, di_F/dt=100A/µs	-	30	38	ns
Reverse recovery charge	Q_{rr}		-	30	38	nC

1 Power dissipation

$P_{tot} = f(T_C)$

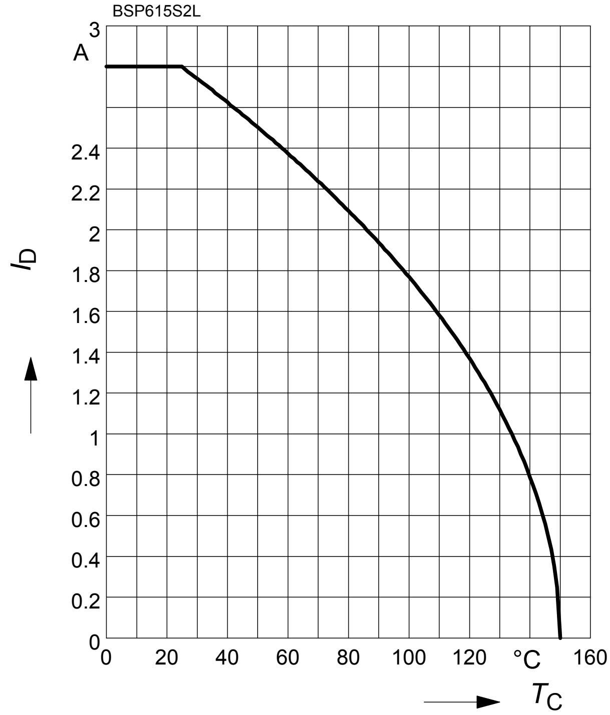
parameter: $V_{GS} \geq 4$ V



2 Drain current

$I_D = f(T_C)$

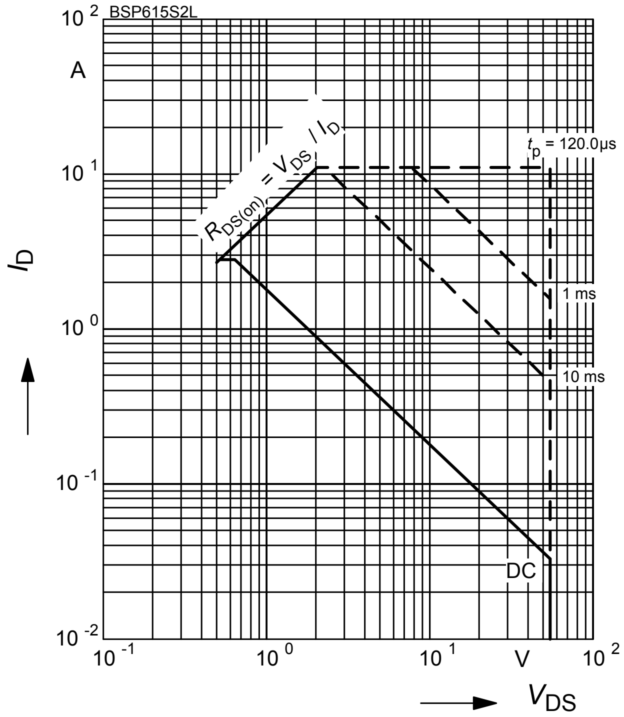
parameter: $V_{GS} \geq 10$ V



3 Safe operating area

$I_D = f(V_{DS})$

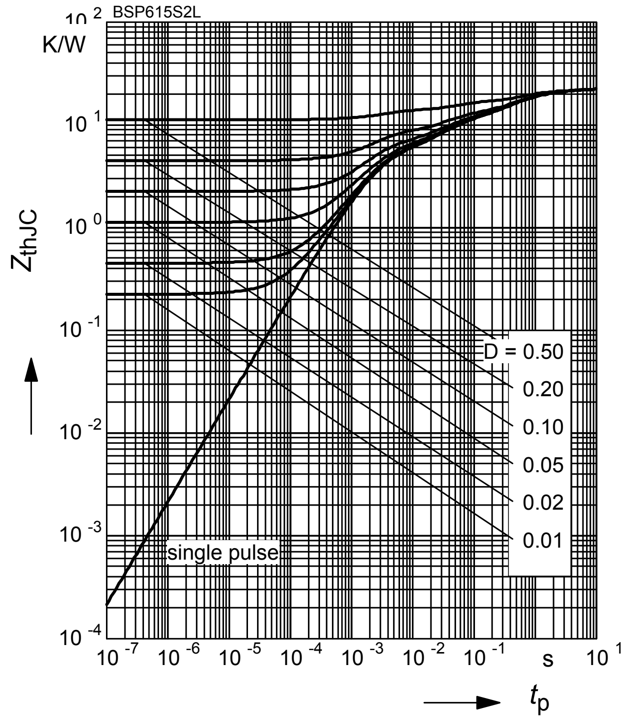
parameter : $D = 0$, T_C = --



4 Max. transient thermal impedance

$Z_{thJC} = f(t_p)$

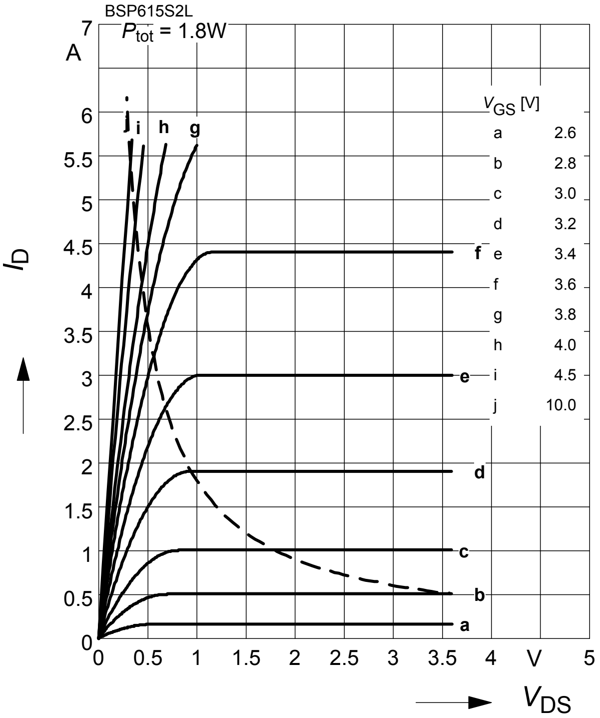
parameter : $D = t_p/T$



5 Typ. output characteristic

$I_D = f(V_{DS})$; T_j=25°C

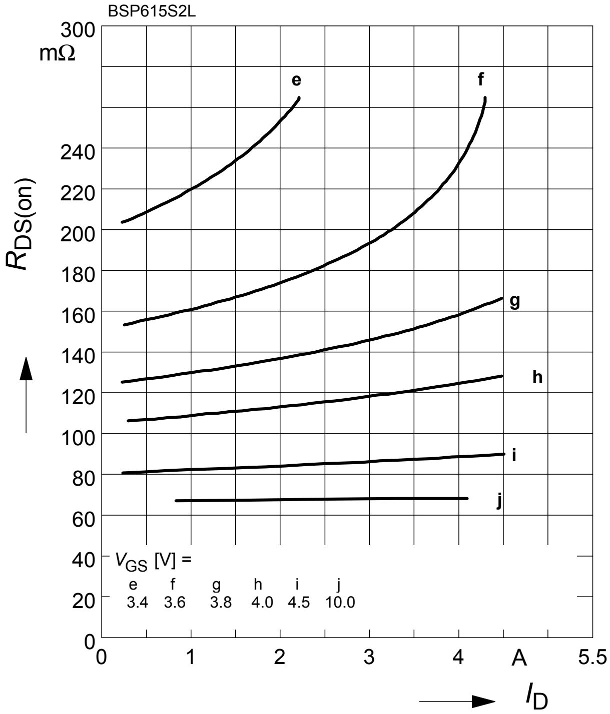
parameter: t_p = 80 µs



6 Typ. drain-source on resistance

$R_{DS(on)} = f(I_D)$

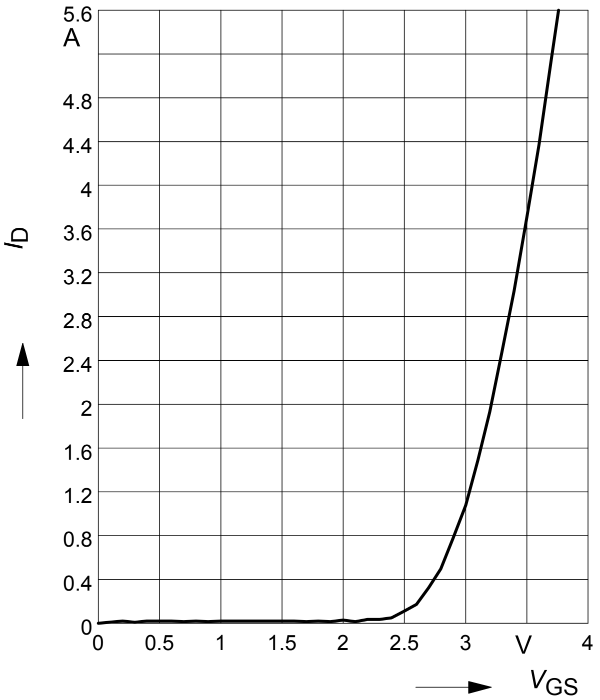
parameter: V_{GS}



7 Typ. transfer characteristics

$I_D = f(V_{GS})$; $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$

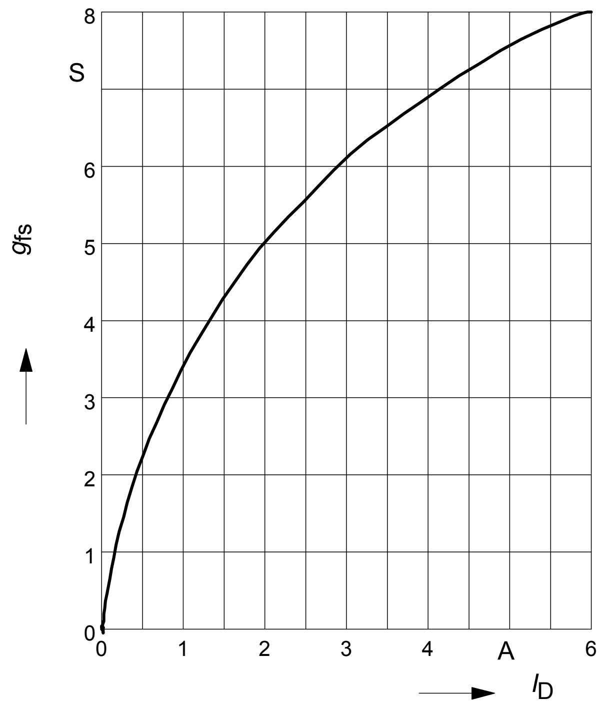
parameter: t_p = 80 µs



8 Typ. forward transconductance

$g_{fs} = f(I_D)$; T_j=25°C

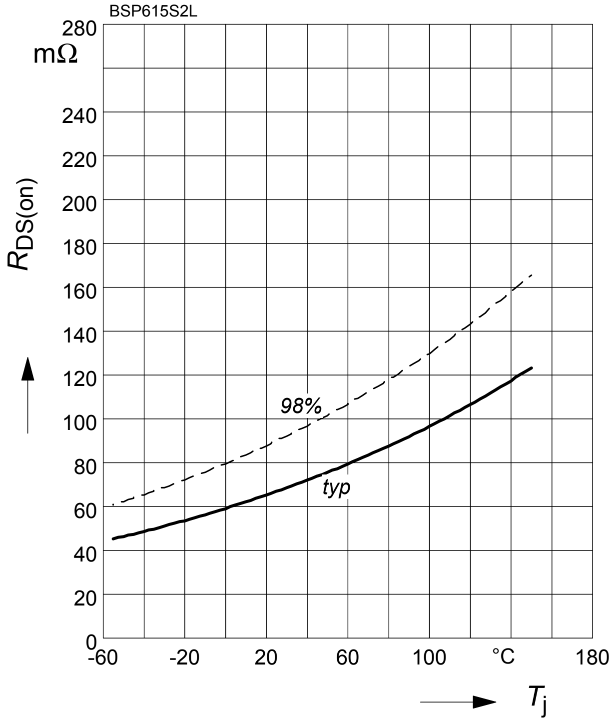
parameter: g_{fs}



9 Drain-source on-state resistance

$R_{DS(on)} = f(T_j)$

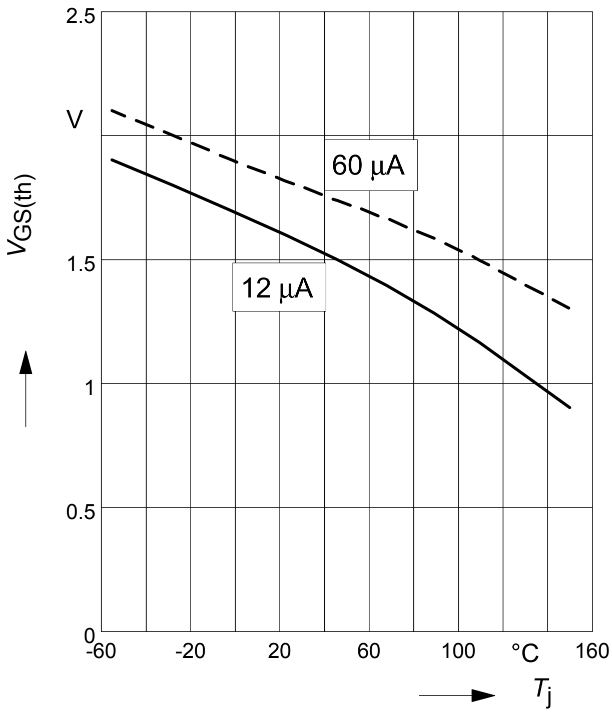
parameter : I_D = 1.4 A, V_{GS} = 10 V



10 Typ. gate threshold voltage

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

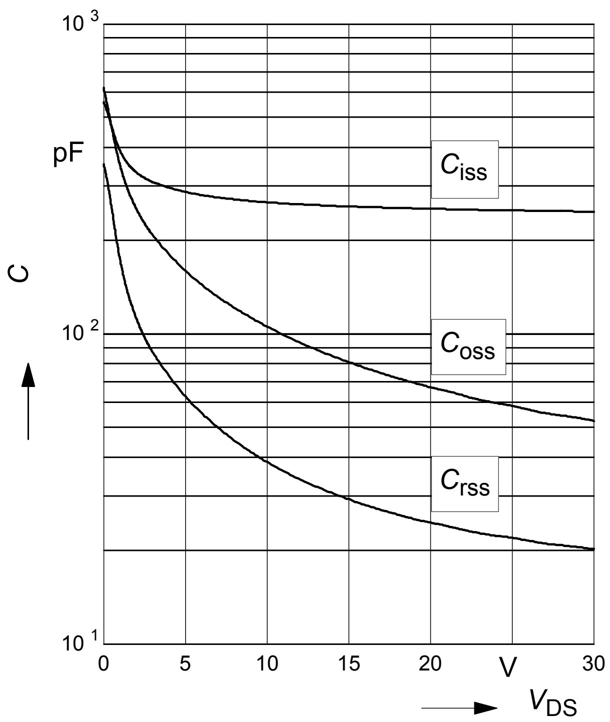
parameter: $V_{GS} = V_{DS}$



11 Typ. capacitances

$C = f(V_{DS})$

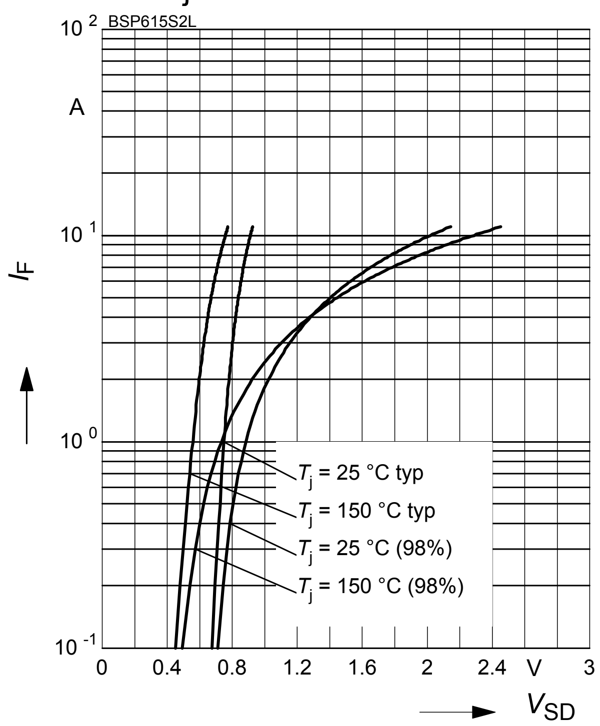
parameter: V_{GS}=0V, f=1 MHz



12 Forward character. of reverse diode

$I_F = f(V_{SD})$

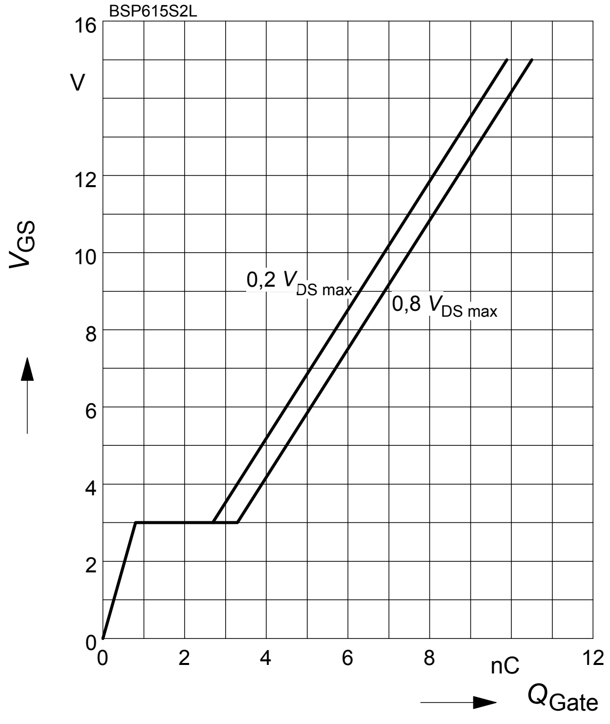
parameter: T_j , t_p = 80 µs



13 Typ. gate charge

$V_{GS} = f\ (Q_{Gate})$

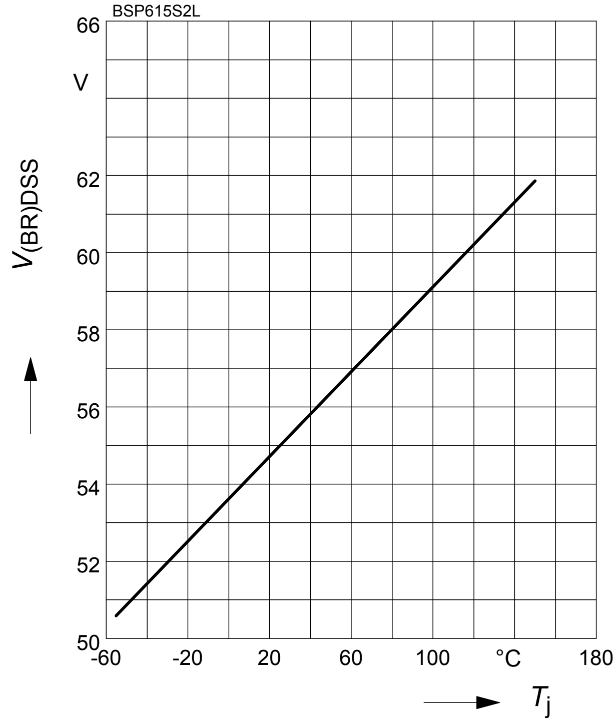
parameter: I_D = 2.8 A pulsed



14 Drain-source breakdown voltage

$V_{(BR)DSS} = f\,(T_j)$

parameter: I_D=10 mA



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