General Description

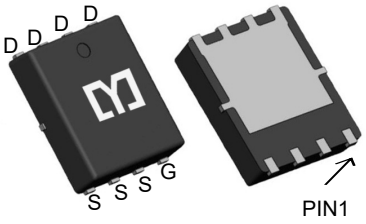
The MY046INE5 use Very low gate charge for high frequency applications,Optimized for dc-dc conversion Excellent gate charge x RDS(on) product (FOM)，Very low on-resistance RDS(on)，150 °C operating tempera ture Pb-free lead plating;

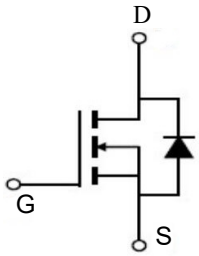
Features

V_{DSS}	100	V
I_D	100	A
$P_D(T_C=25℃)$	156	W
$R_{DS(ON)}(atV_{GS}=10V)$	<4.6	mÝ

Application

- Battery protection
- Load switch
- Uninterruptible power supply





Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY046INE5	PDFN5*6-8L	046IN	5000

Absolute Maximum Ratings (T_J=25℃unless otherwise noted)

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	T_C=25 °C	100	A
		T_C=100 °C	85	
		T_A=25 °C, R_{thJA}=50 K/W[2)]	17.0	
Pulsed drain current[3)]	$I_{D,pulse}$	T_C=25 °C	400	
Avalanche energy, single pulse	E_{AS}	I_D=50 A, R_{GS}=25 Ω	350	mJ
Gate source voltage	V_{GS}		±20	V
Power dissipation	P_{tot}	T_C=25 °C	156	W
Operating and storage temperature	T_j, T_{stg}		-55 ... 150	°C
IEC climatic category; DIN IEC 68-1			55/150/56	

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal characteristics						
Thermal resistance, junction - case	R_{thJC}		-	-	0.8	K/W
Thermal resistance, junction - ambient	R_{thJA}	minimal footprint	-	-	62	K/W
		6 cm^2 cooling area[2)]	-	-	50	K/W
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=120 µA	2	2.7	3.5	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=100 V, V_{GS}=0 V, T_j=25 °C	-	0.01	1	µA
		V_{DS}=100 V, V_{GS}=0 V, T_j=125 °C	-	10	100	µA
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=50 A	-	4	4.6	mΩ
		V_{GS}=6 V, I_D=25 A	-	5.1	8.6	mΩ
Gate resistance	R_G		-	1.9	-	Ω
Transconductance	g_{fs}	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=50 A	48	96	-	S

[1)] J-STD20 and JESD22

[2)] Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm^2 (one layer, 70 µm thick) copper area for drain connection. PCB is vertical in still air.

[3)] see figure 3

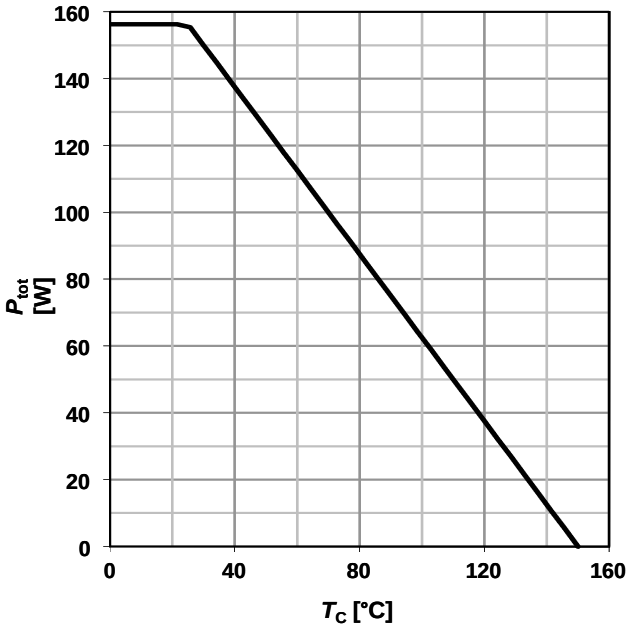
Typical Characteristics

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic characteristics						
Input capacitance	C_{iss}	V_{GS}=0 V, V_{DS}=50 V, f =1 MHz	-	4500	-	pF
Output capacitance	C_{oss}		-	790	-	
Reverse transfer capacitance	C_{rss}		-	30	-	
Turn-on delay time	$t_{d(on)}$	V_{DD}=50 V, V_{GS}=10 V, I_D=25 A, R_G=1.6 Ω	-	16	-	ns
Rise time	t_r		-	14	-	
Turn-off delay time	$t_{d(off)}$		-	41	-	
Fall time	t_f		-	11	-	
Gate Charge Characteristics[4)]						
Gate to source charge	Q_{gs}	V_{DD}=50 V, I_D=50 A, V_{GS}=0 to 10 V	-	20	-	nC
Gate to drain charge	Q_{gd}		-	11	-	
Switching charge	Q_{sw}		-	19	-	
Gate charge total	Q_g		-	63	-	
Gate plateau voltage	$V_{plateau}$		-	4.4	-	V
Output charge	Q_{oss}	V_{DD}=50 V, V_{GS}=0 V	-	84	-	nC
Reverse Diode						
Diode continous forward current	I_S	T_C=25 °C	-	-	100	A
Diode pulse current	$I_{S,pulse}$		-	-	400	
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=50 A, T_j=25 °C	-	1	1.2	V
Reverse recovery time	t_{rr}	V_R=50 V, I_F=25 A, di_F/dt =100 A/µs	-	56	-	ns
Reverse recovery charge	Q_{rr}		-	101	-	nC

[4)] See figure 16 for gate charge parameter definition

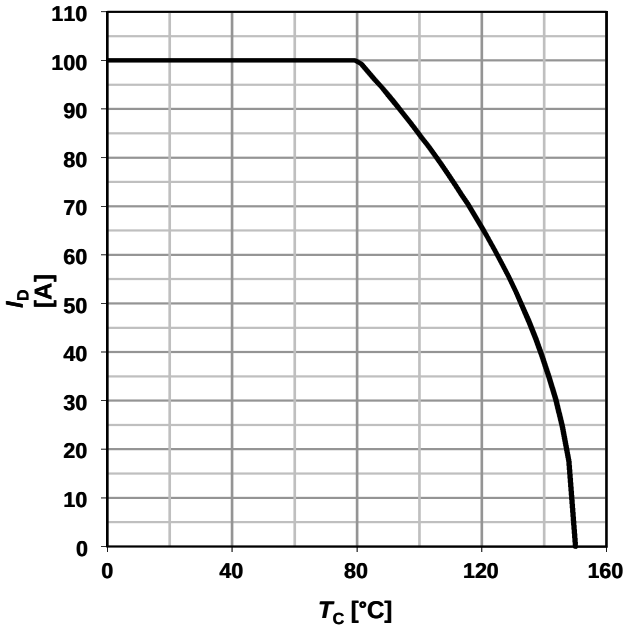
1 Power dissipation

P_{tot}=f(T_C)



2 Drain current

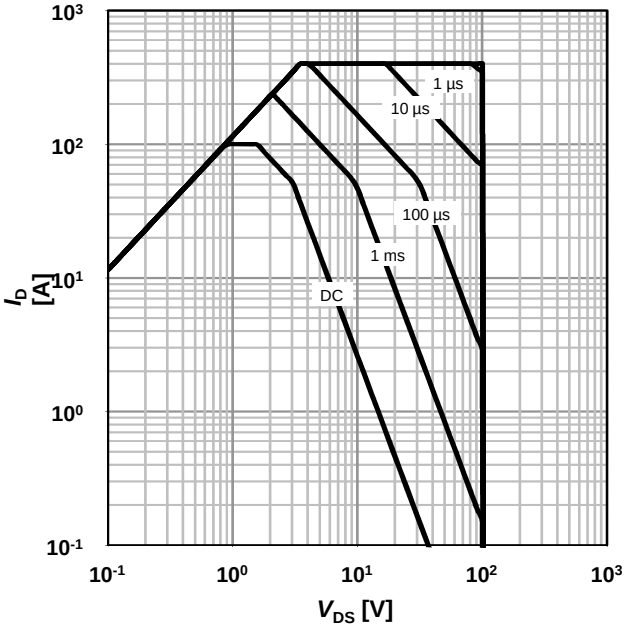
I_D=f(T_C); V_{GS}≥10 V



3 Safe operating area

I_D=f(V_{DS}); T_C=25 °C; D=0

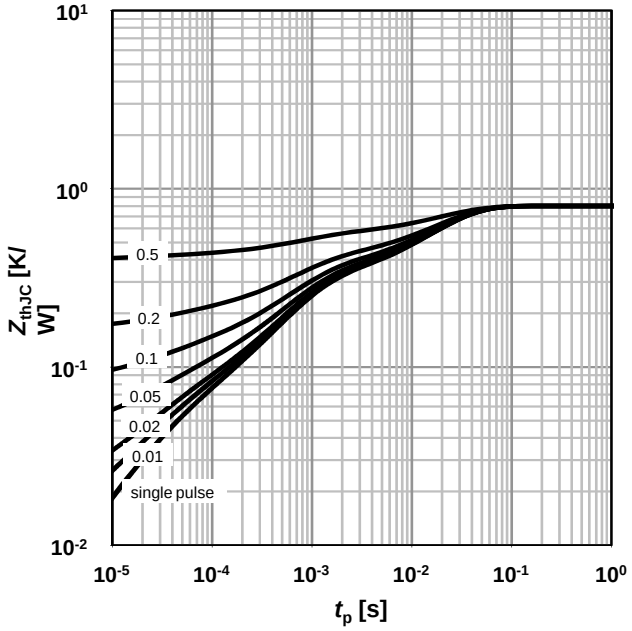
parameter: t_p



4 Max. transient thermal impedance Z_{thJC}

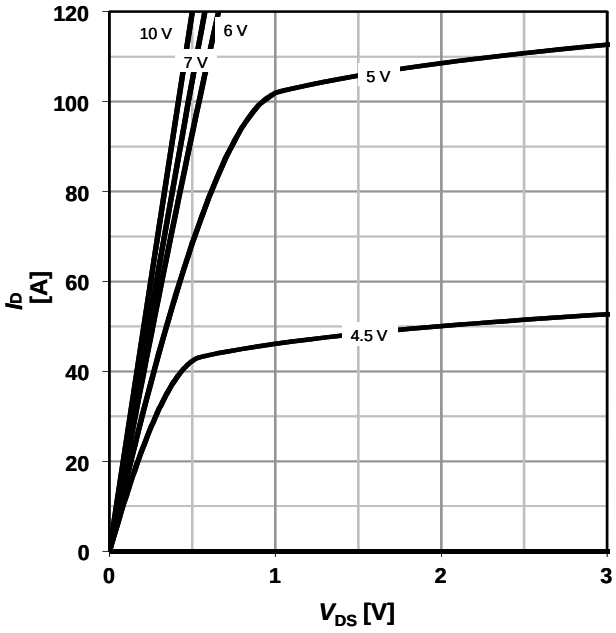
Z_{thJC}=f(t_p)

parameter: $D=t_p/T$



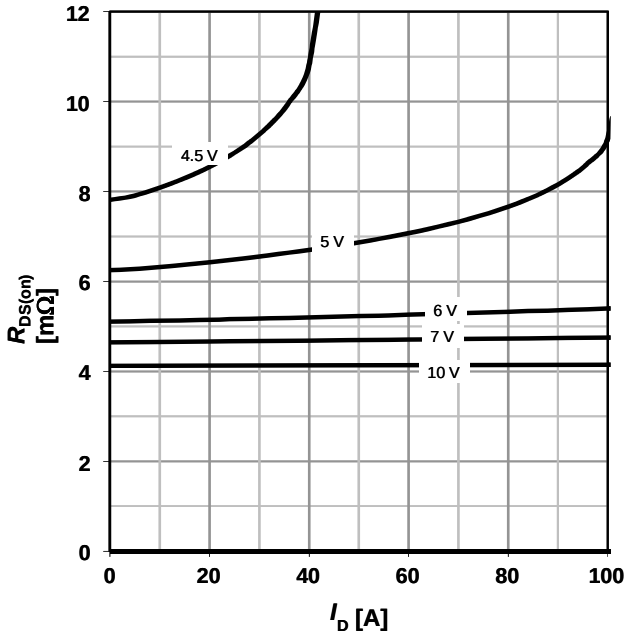
5 Typ. output characteristics *I*

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



6 Typ. drain-source on resistance

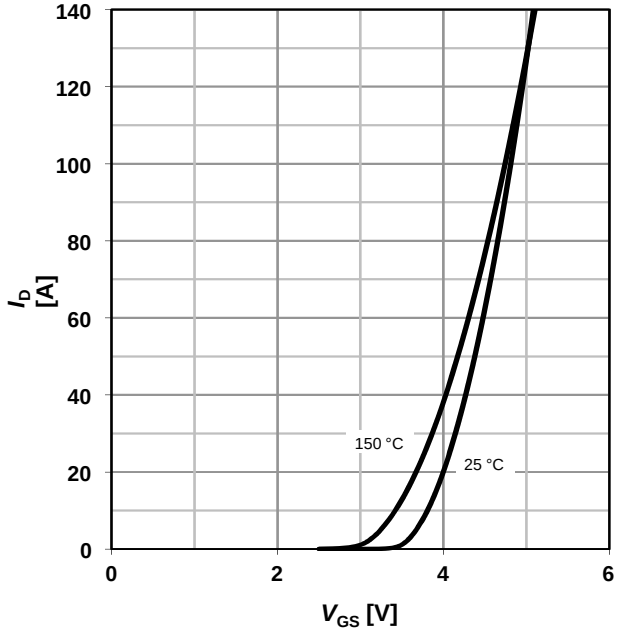
$R_{DS(on)}$=f(I_D); T_j=25 °C parameter: V_{GS}



7 Typ. transfer characteristics *I*

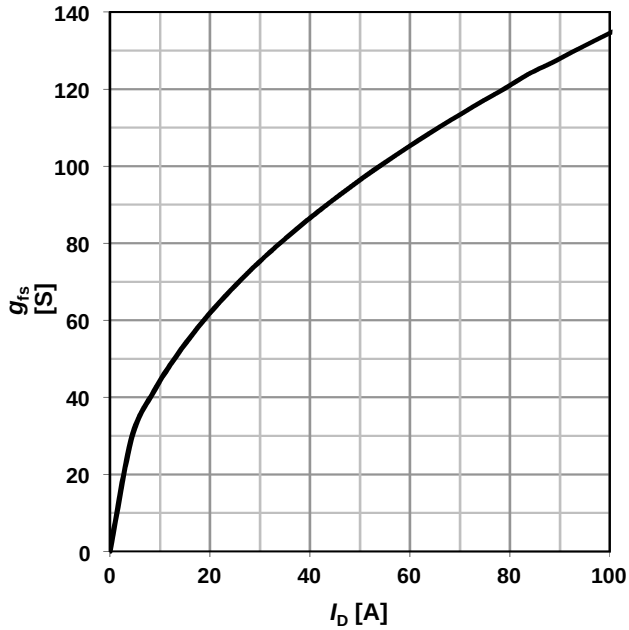
$_D$=f(V_{GS}); $|V_{DS}|>2|I_D|R_{DS(on)max}$

parameter: T_j



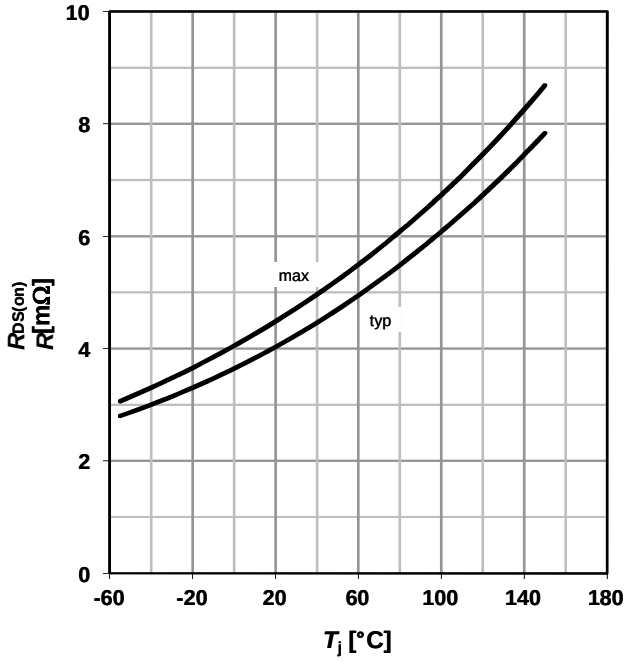
8 Typ. forward transconductance *g*

$_{fs}$=f(I_D); T_j=25 °C



9 Drain-source on-state resistance

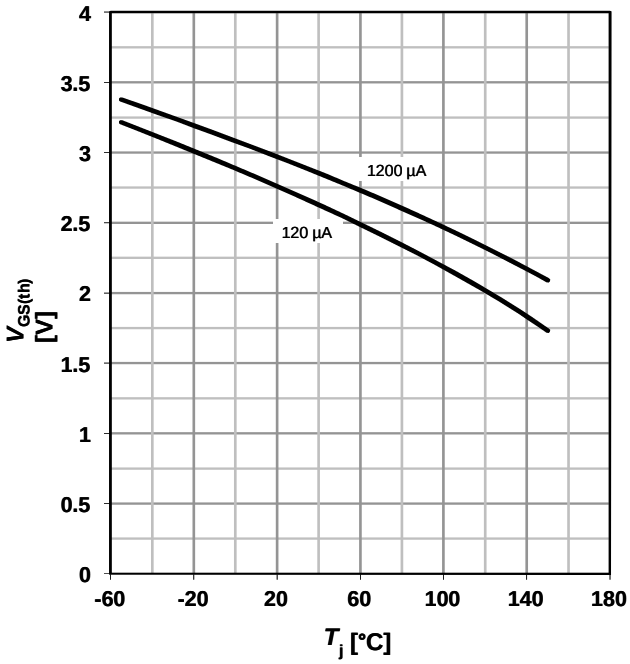
$R_{DS(on)}$=f(T_j); I_D=50 A; V_{GS}=10 V



10 Typ. gate threshold voltage

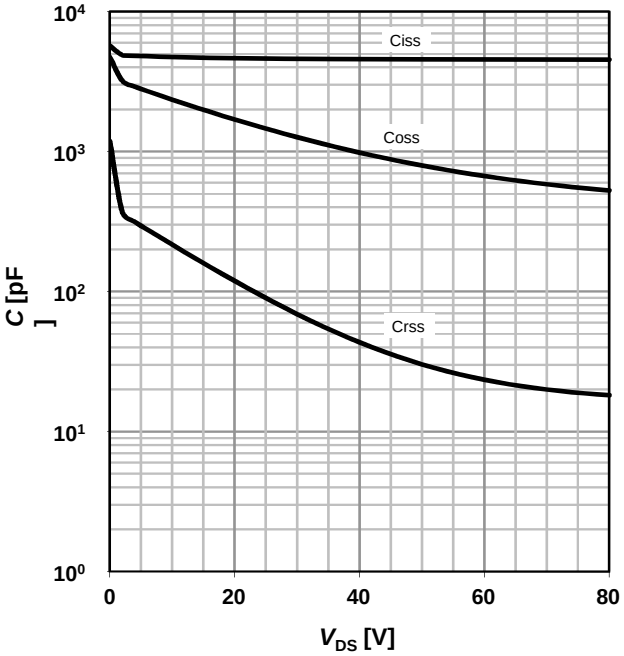
$V_{GS(th)}$=f(T_j); V_{GS}=V_{DS} parameter:

I_D



11 Typ. capacitances

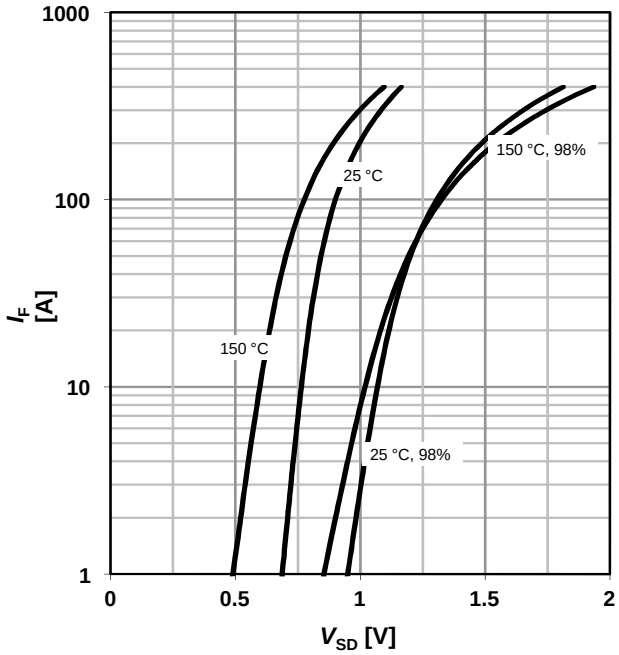
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz



12 Forward characteristics of reverse diode

I_F=f(V_{SD})

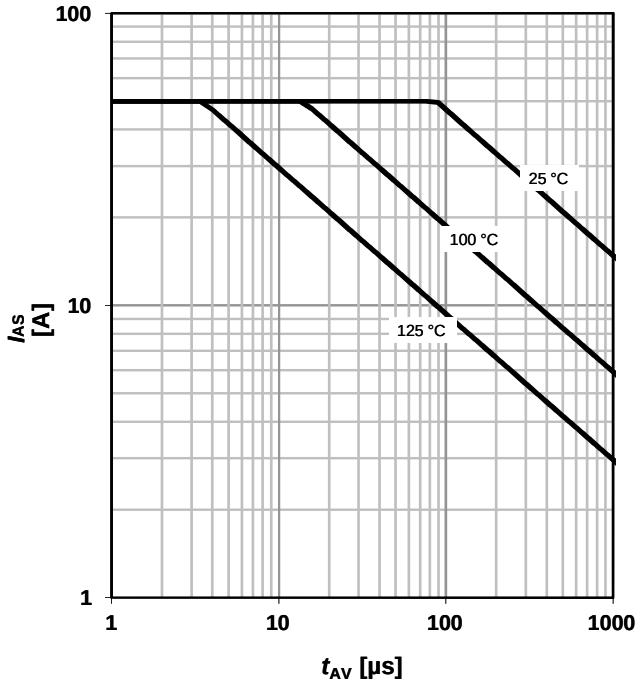
parameter: T_j



13 Avalanche characteristics

I_{AS}=f(t_{AV}); R_{GS}=25 Ω

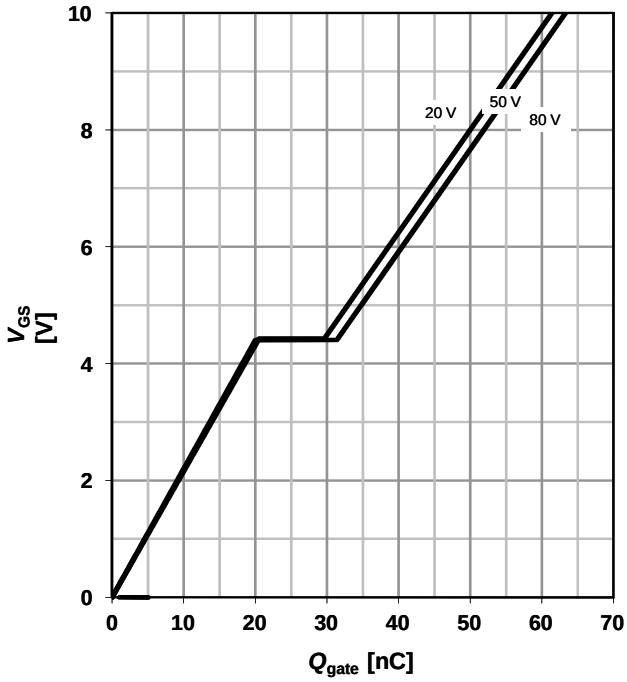
parameter: $T_{j(start)}$



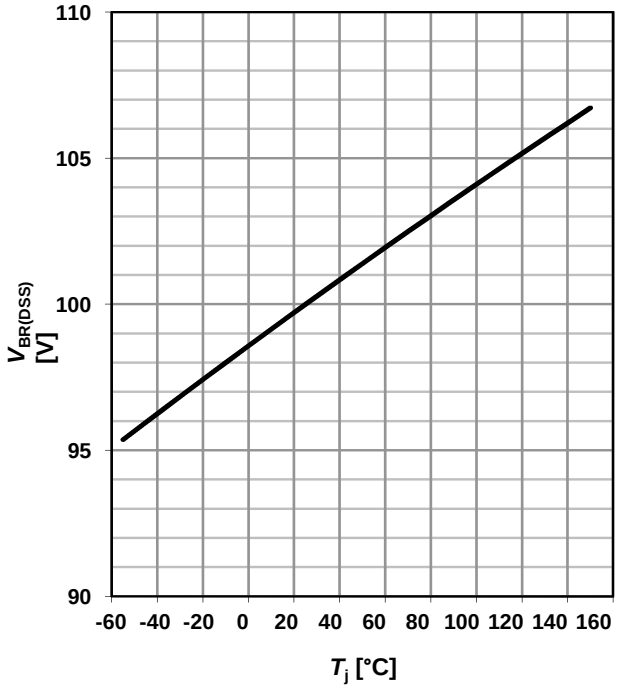
14 Typ. gate charge

V_{GS}=f(Q_{gate}); I_D=50 A pulsed

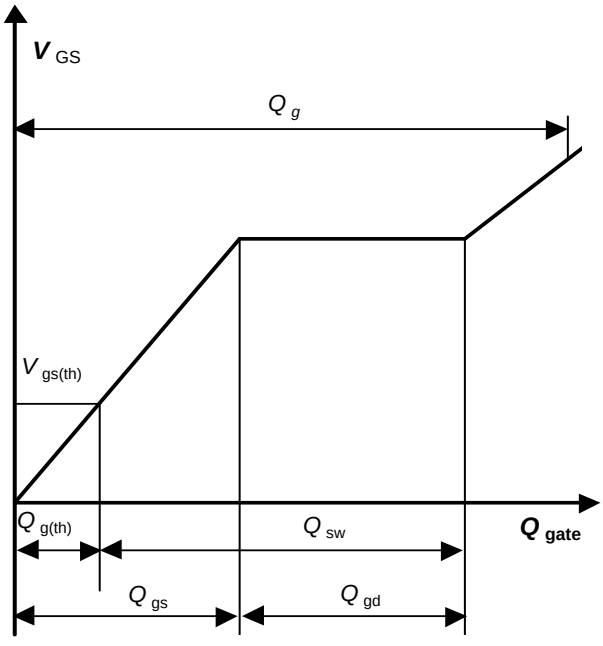
parameter: V_{DD}



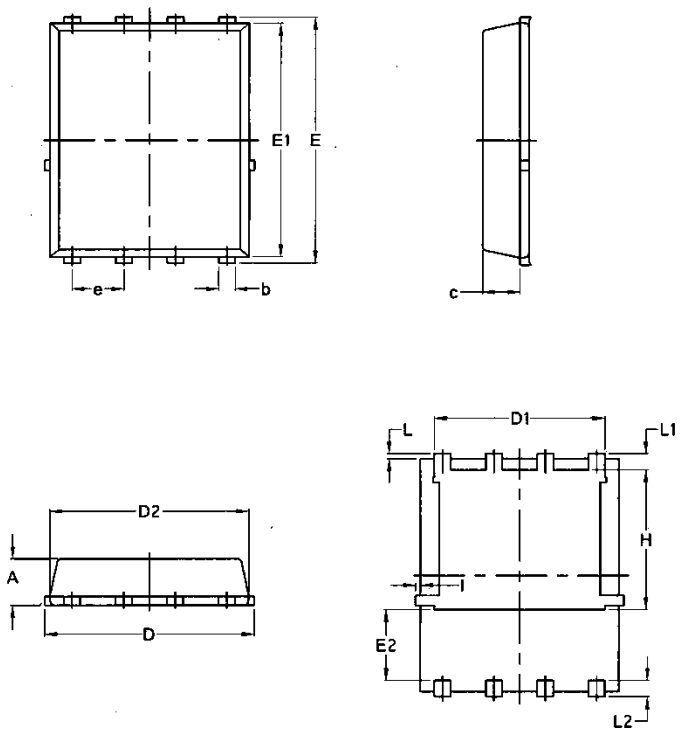
15 Drain-source breakdown voltage $V_{BR(DSS)}$=f(T_j); I_D=1 mA



16 Gate charge waveforms



Package Mechanical Data-DFN5*6-8L-JQ Single



Symbol	Common			
	mm		Inch	
	Mim	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070