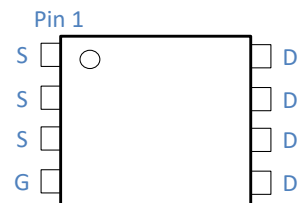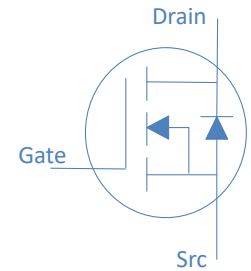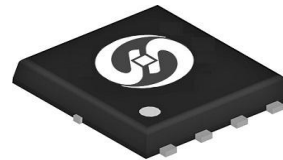## 200V N-Ch Power MOSFET

Feature

◇ High Speed Power Switching, Logic Level

◇ Enhanced Body diode dv/dt capability

◇ Enhanced Avalanche Ruggedness

◇ 100% UIS Tested, 100% Rg Tested

◇ Lead Free

V_{DS}		200	V
$R_{DS(on),typ}$	V_{GS}=10V	28	mΩ
$R_{DS(on),typ}$	V_{GS}=4.5V	33	mΩ
I_D		41	A

Application

◇ Synchronous Rectification in SMPS

◇ Hard Switching and High Speed Circuit

◇ Power Tools

◇ UPS

◇ Motor Control

DFN5*6

Part Number	Package	Marking
HGN320N20SL	DFN5*6	GN320N20SL

Pin 1

S   D
S   D
S   D
G   D

Absolute Maximum Ratings at T_J=25℃ (unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current	I_D	T_C=25℃	41	A
		T_C=100℃	26	
Drain to Source Voltage	V_{DS}	-	200	V
Gate to Source Voltage	V_{GS}	-	±20	V
Pulsed Drain Current	I_{DM}	-	140	A
Avalanche Energy, Single Pulse	E_{AS}	L=0.4mH, T_C=25℃	180	mJ
Power Dissipation	P_D	T_C=25℃	125	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to150	℃

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Case	$R_{\theta JC}$	1	℃/W
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	50	℃/W

Electrical Characteristics at T_j=25℃ (unless otherwise specified)

Static Characteristics

Parameter	Symbol	Conditions	min	typ	max	Unit
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	200	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	1	2	3	
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V, V_{DS}=200V, T_j=25℃	-	-	1	μA
		V_{GS}=0V, V_{DS}=200V, T_j=100℃	-	-	100	
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Drain to Source on Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=10A	-	28	32	mΩ
Drain to Source on Resistance	$R_{DS(on)}$	V_{GS}=4.5V, I_D=10A	-	33	40	mΩ
Transconductance	g_{fs}	V_{DS}=5V, I_D=10A	-	40	-	S
Gate Resistance	R_G	V_{GS}=0V, V_{DS} Open, f=1MHz	-	4.6	-	Ω

Dynamic Characteristics

Parameter	Symbol	Conditions	min	typ	max	Unit
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=100V, f=1MHz	-	1704	-	pF
Output Capacitance	C_{oss}		-	124	-	
Reverse Transfer Capacitance	C_{rss}		-	6	-	
Total Gate Charge	Q_g (10V)	V_{DD}=100V, I_D=10A, V_{GS}=10V	-	23	-	nC
Total Gate Charge	Q_g (4.5V)			11		
Gate to Source Charge	Q_{gs}		-	5	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	3	-	
Turn on Delay Time	$t_{d(on)}$	V_{DD}=100V, I_D=10A, V_{GS}=10V, R_G=10Ω,	-	12	-	ns
Rise time	t_r		-	16	-	
Turn off Delay Time	$t_{d(off)}$		-	26	-	
Fall Time	t_f		-	11	-	

Reverse Diode Characteristics

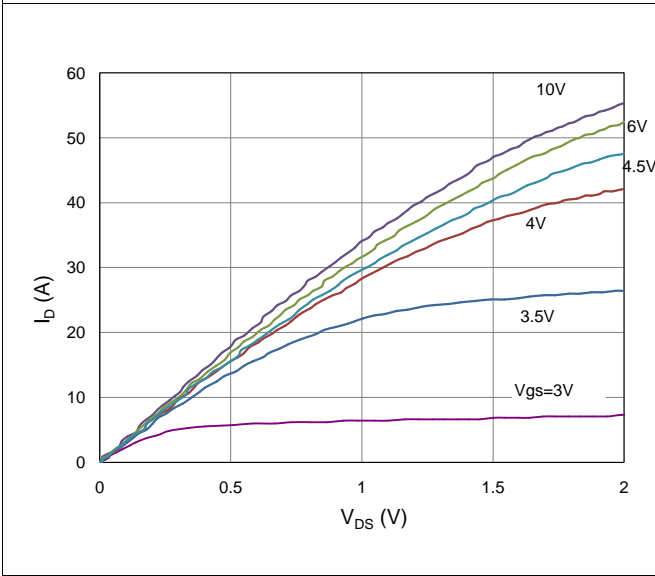| Parameter	Symbol	Conditions	min	typ	max	Unit
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_F=10A	-	0.9	1.2	V
Reverse Recovery Time	t_{rr}	V_R=100V, I_F=10A, dI_F/dt=100A/μs	-	89	-	ns
Reverse Recovery Charge	Q_{rr}		-	213	-	nC

Fig 1. Typical Output Characteristics

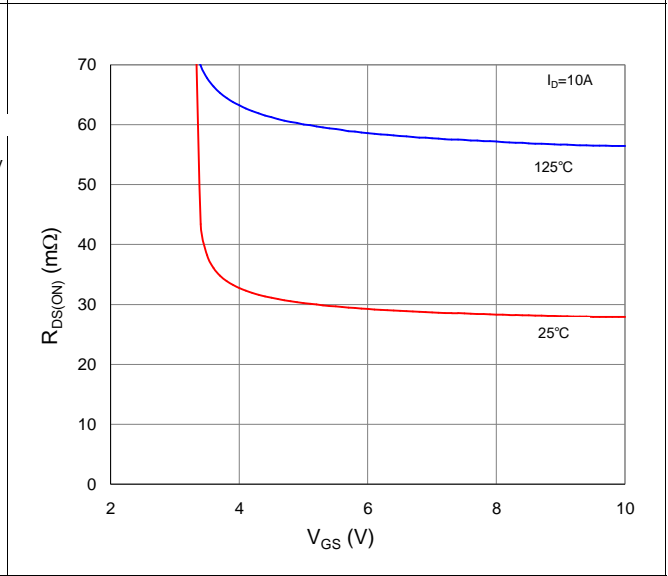Figure 2. On-Resistance vs. Gate-Source Voltage

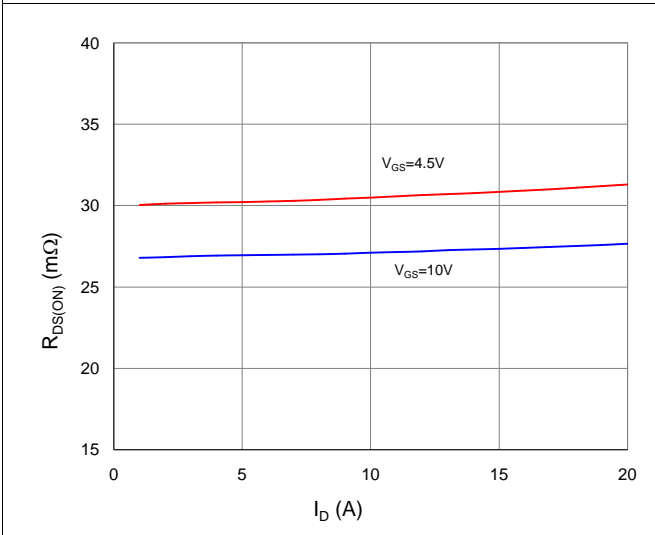Figure 3. On-Resistance vs. Drain Current and Gate Voltage

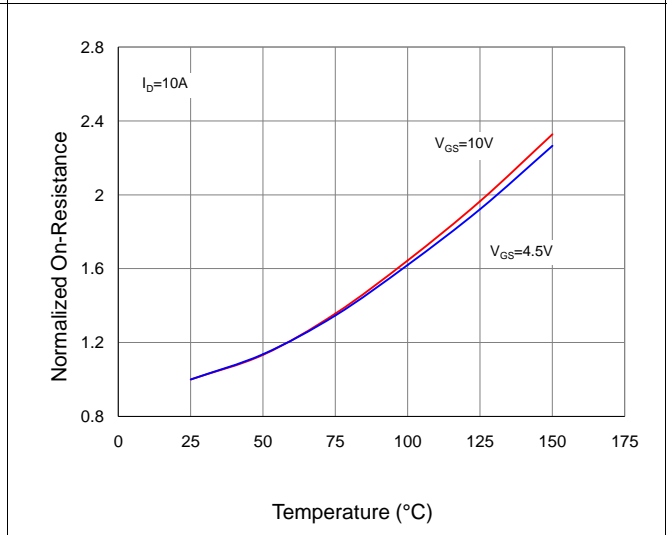Figure 4. Normalized On-Resistance vs. Junction Temperature
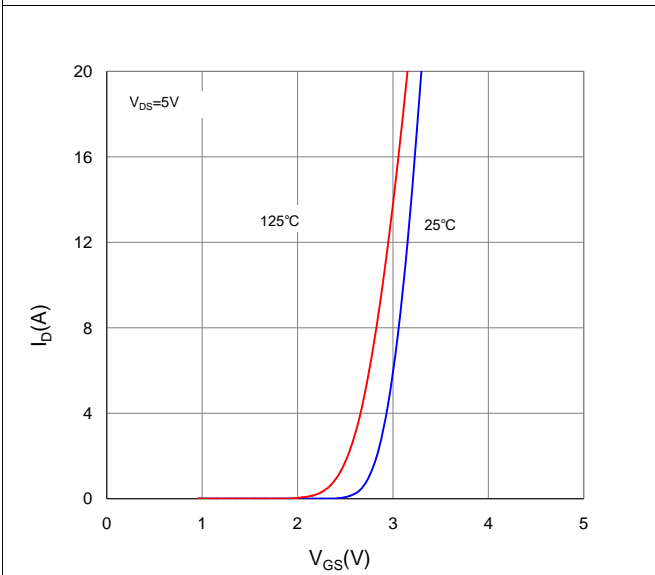

Figure 5. Typical Transfer Characteristics

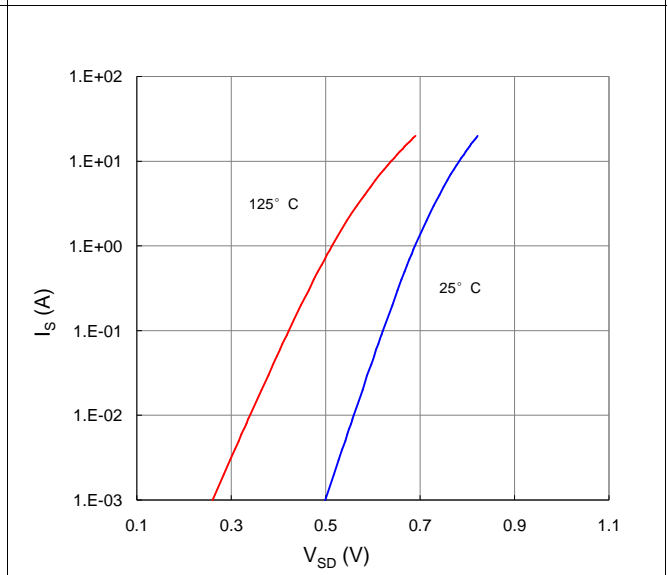Figure 6. Typical Source-Drain Diode Forward Voltage

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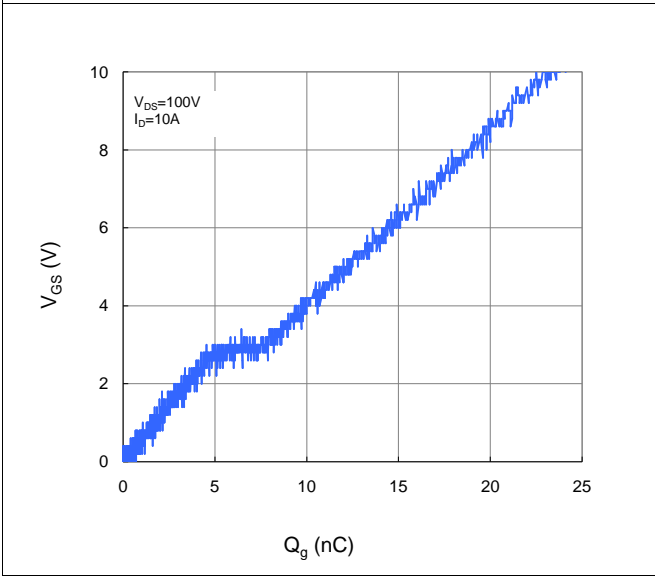
Hunteck

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

V_{DS}=100V
I_D=10A

V_{GS} (V)

Q_g (nC)

Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

C_{iss}

C_{oss}

C_{rss}

Capacitance (pF)

V_{DS} (V)
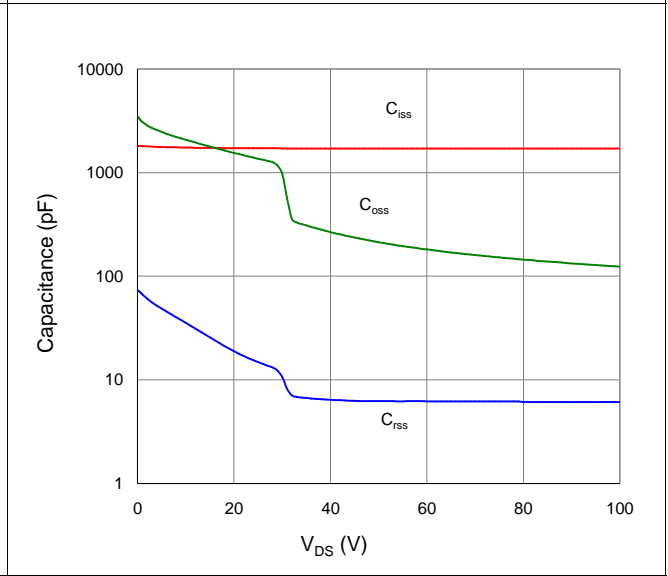
Figure 9. Maximum Safe Operating Area

$R_{DS(ON)}$ limited
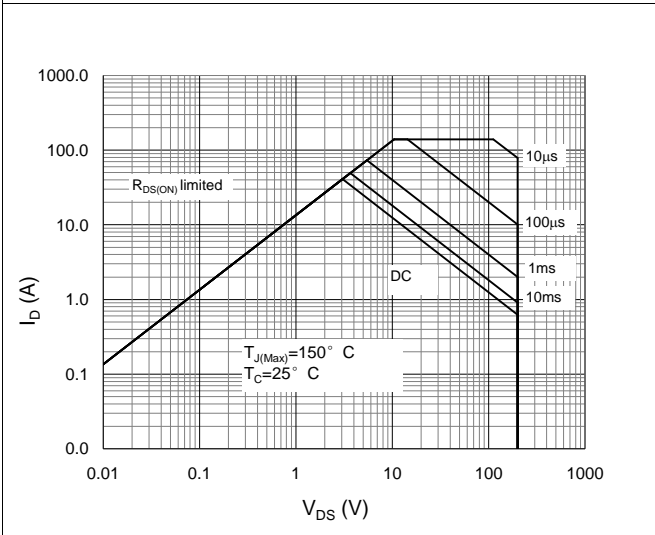
10μs
100μs
1ms
10ms

DC

$T_{J(Max)}$=150°C
T_C=25°C

I_D (A)

V_{DS} (V)

Figure 10. Maximun Drain Current vs. Case Temperature
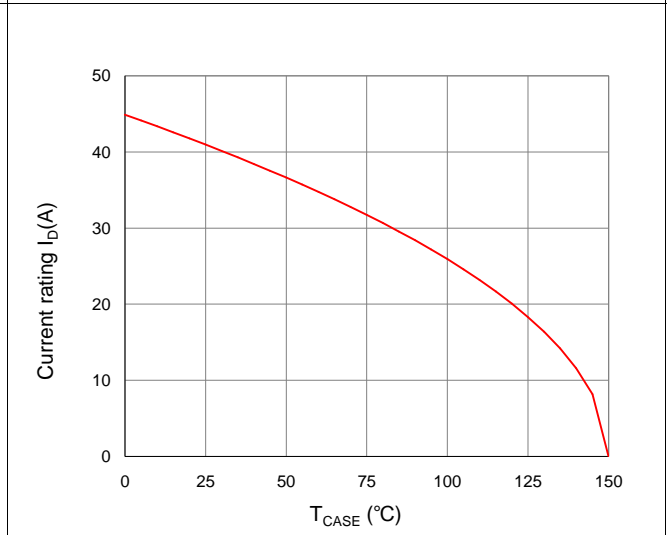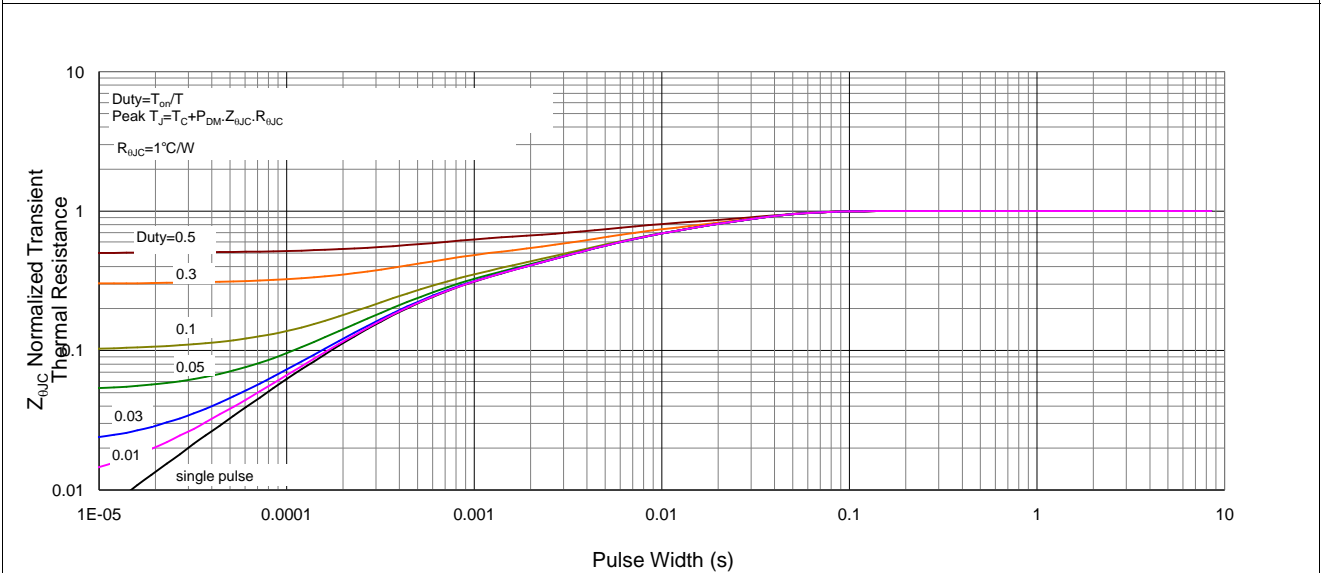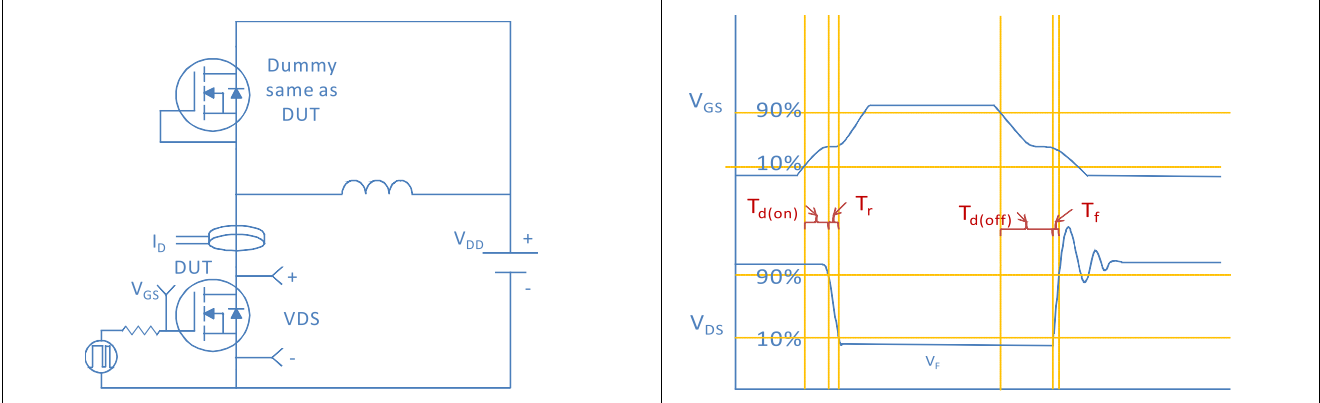
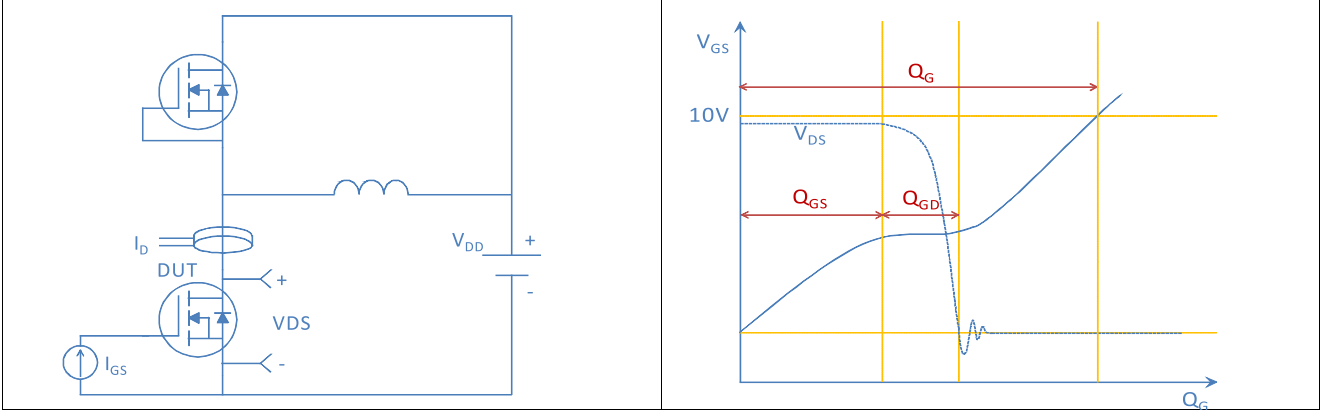Current rating I_D(A)

T_{CASE} (℃)

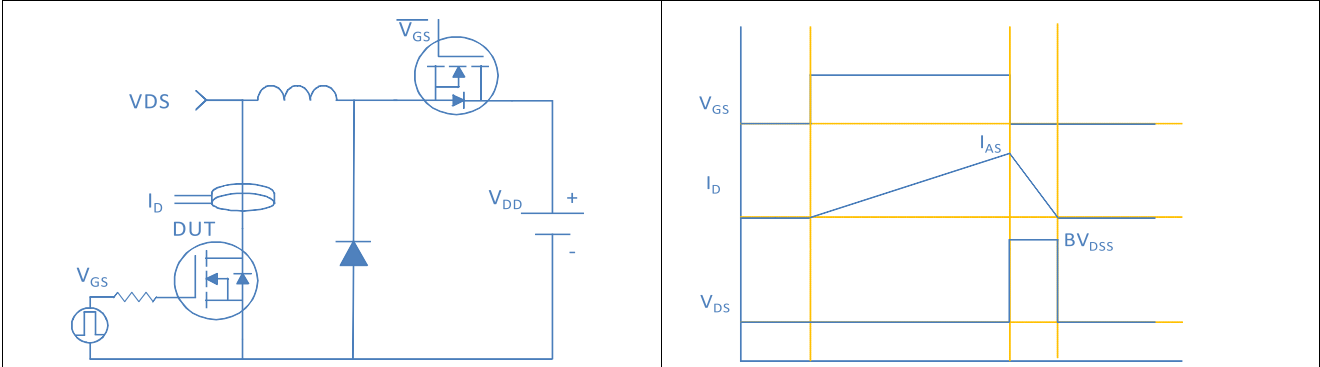Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

Duty=T_{on}/T
Peak T_J=T_C+P_{DM}.$Z_{\theta JC}$.$R_{\theta JC}$

$R_{\theta JC}$=1℃/W

Duty=0.5

0.3

0.1

0.05

0.03

0.01

single pulse

$Z_{\theta JC}$ Normalized Transient Thermal Resistance

Pulse Width (s)

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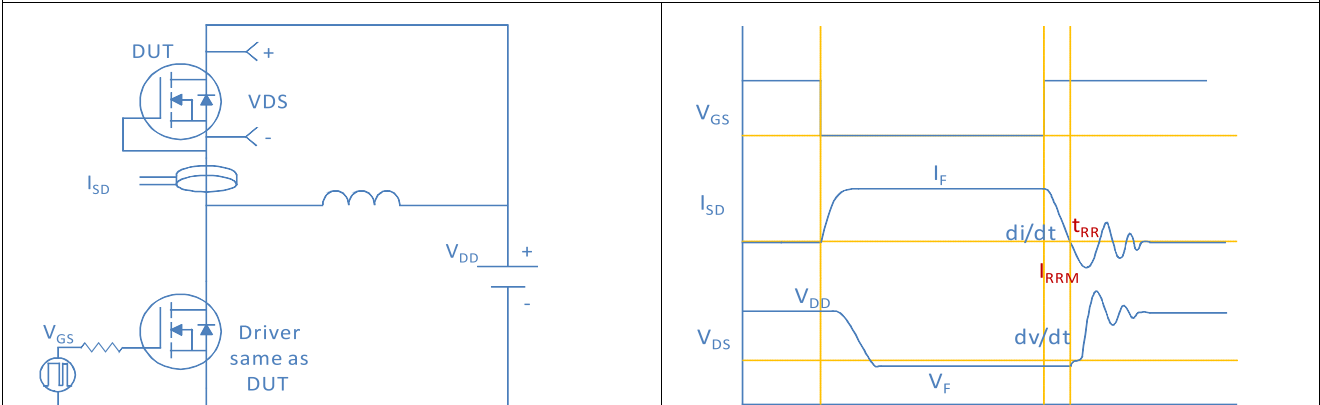## Inductive switching Test
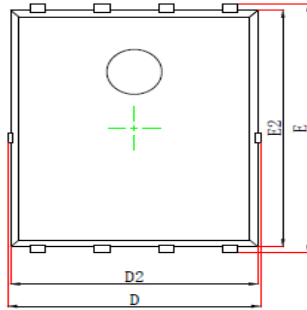

Gate Charge Test

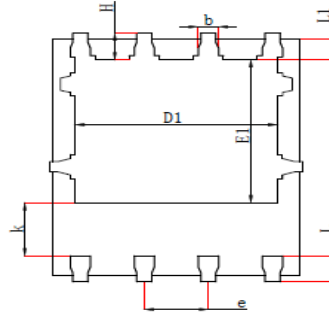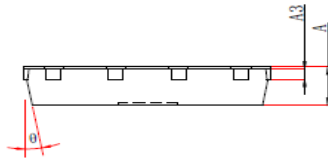## Uclamped Inductive Switching (UIS) Test

Diode Recovery Test

DFN5*6, 8 leads

Top View
[顶视图]

Bottom View
[背视图]

Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A3	0.254 REF		0.010REF	
D	4.680	5.120	0.184	0.202
E	5.900	6.126	0.232	0.241
D1	3.610	4.110	0.142	0.162
E1	3.380	3.780	0.133	0.149
D2	4.800	5.000	0.189	0.197
E2	5.674	5.826	0.223	0.229
k	1.100	1.390	0.043	0.055
b	0.330	0.510	0.013	0.020
e	1.270TYP		1.270TYP	
L	0.510	0.711	0.020	0.028
L1	0.424	0.576	0.017	0.023
H	0.410	0.726	0.016	0.029
θ	0^0	12^0	0^0	12^0