

Complementary High Density Trench MOSFET (60V,2.6A)

PRODUCT SUMMARY

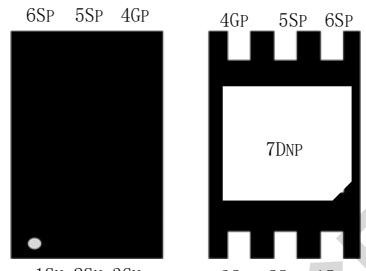
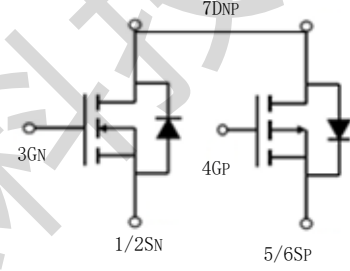
PRODUCT SUMMARY (N-Channel)			PRODUCT SUMMARY (P-Channel)		
V _{DSS}	I _D	R _{DS(on)} (mΩ) Typ.	V _{DSS}	I _D	R _{DS(on)} (mΩ) Typ.
60V	3.5A	88@ V _{GS} = 10V, I _D =3.5A	-60V	-2.6A	180@ V _{GS} = 10V, I _D =2.6A
		100@ V _{GS} = 4.5V, I _D =1A			200@ V _{GS} = 4.5V, I _D =1A

Features

- Super high density cell design for extremely low R_{DS(ON)}
- Exceptional on-resistance and maximum DC current capability
- Excellent Q_g x R_{DS(ON)} product (FOM)
- Lead (Pb) -free and halogen-free

Applications

- Motor control and drive
- LED Backlight

DFN2*3-6L 			TOP Marking ⌘ ET6608 XXXXXX XXXXXX:D/C		
					

Absolute Maximum Ratings (T_A=25°C, unless otherwise noted)

Symbol	Parameter	Max N	Max P	Units
V _{DS}	Drain-Source Voltage	60	-60	V
V _{GS}	Gate-Source Voltage	±20	±20	V
I _D	Drain Current (Continuous)@T _A =25°C	3.5	-2.6	A
	Drain Current (Continuous)@T _A =75°C	2.5	-1.5	A
I _{DM}	Drain Current (Pulsed) ^a	14	-10	A
P _D	Total Power Dissipation @T _c =25°C	2.8	1.8	W
	Total Power Dissipation @T _c =75°C	1.8	1.1	W
I _S	Maximum Diode Forward Current	3.5	2.6	A
T _j , T _{stg}	Operating Junction and Storage Temperature Range	-55 to +150	-55 to +150	°C
R _{QJA}	Thermal Resistance Junction to Ambient (PCB mounted) ^b	43	56	°C/W

a: Repetitive Rating: Pulse width limited by the maximum junction temperature.

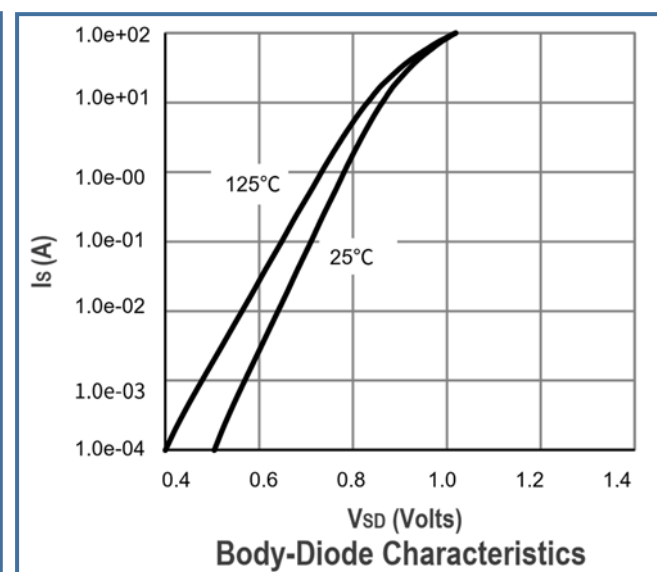
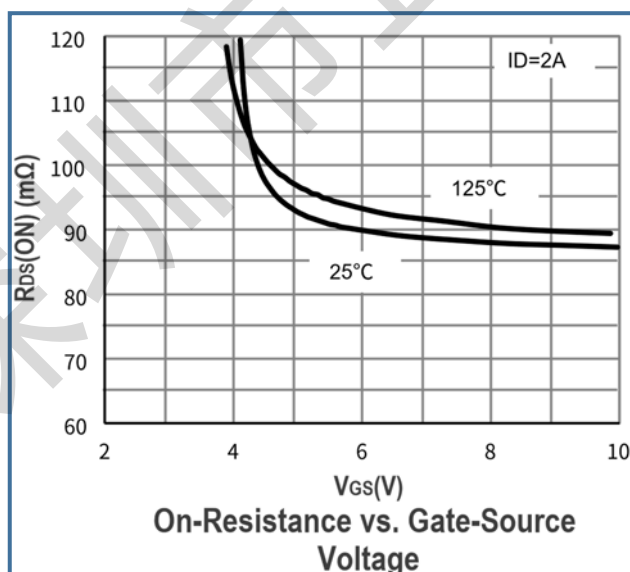
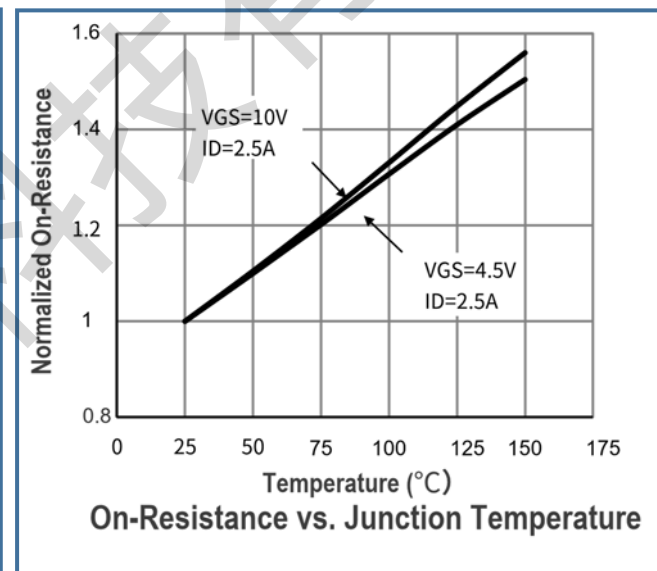
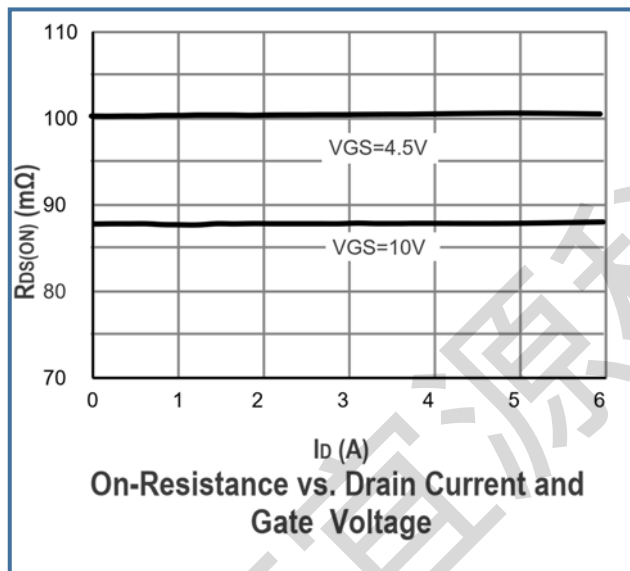
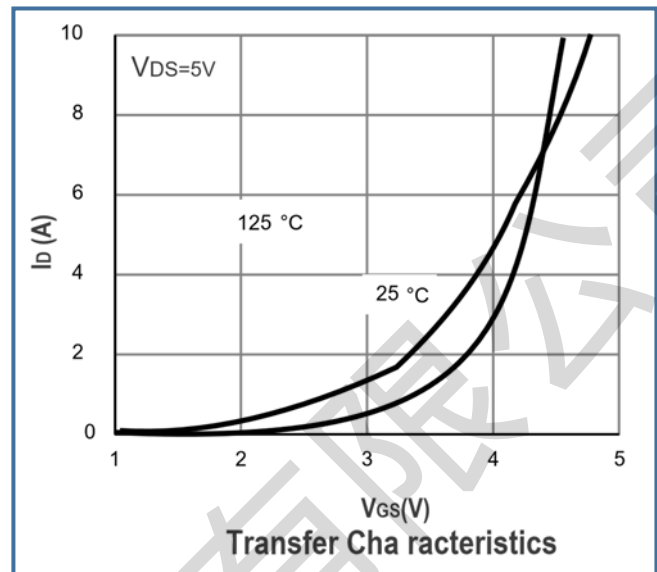
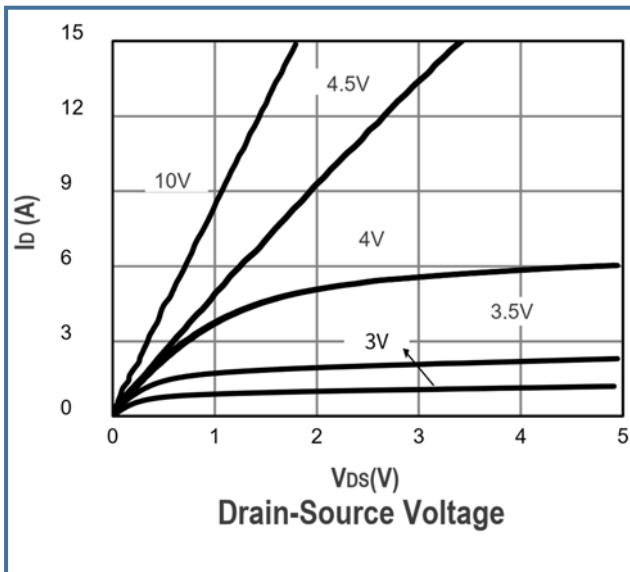
b: 1-in² 2oz Cu PCB board

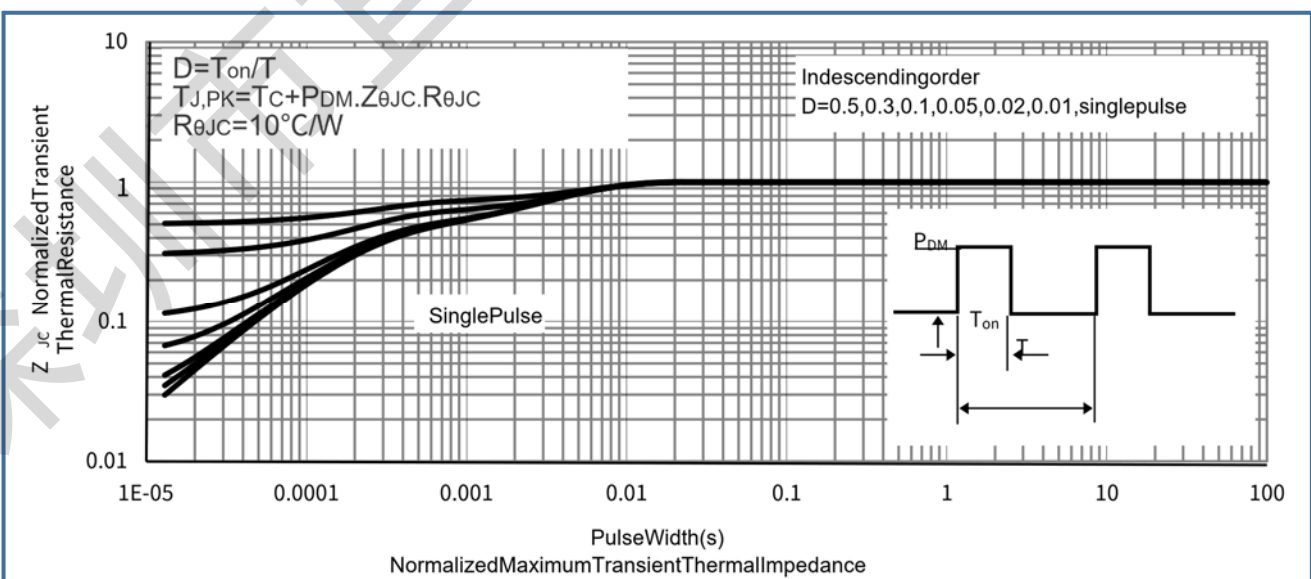
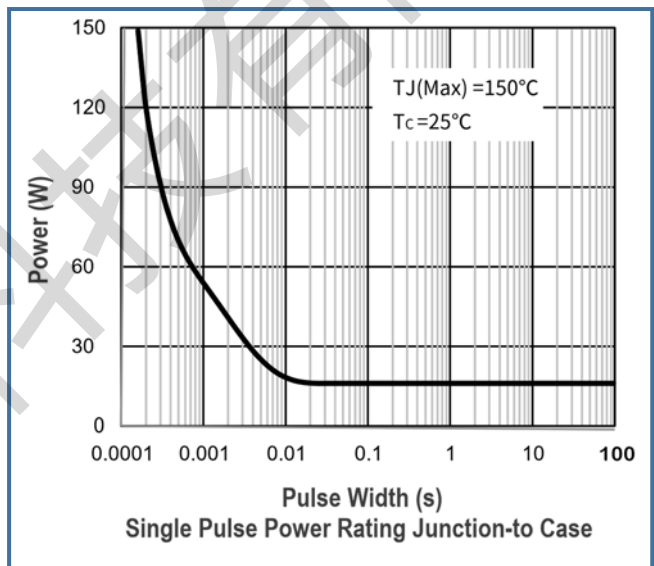
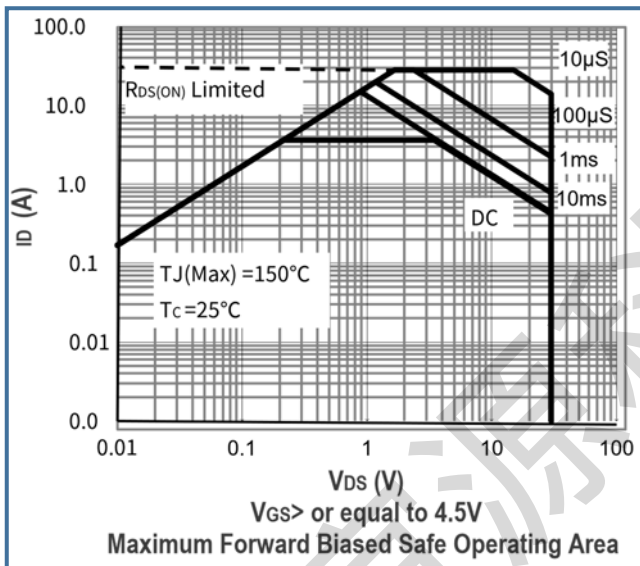
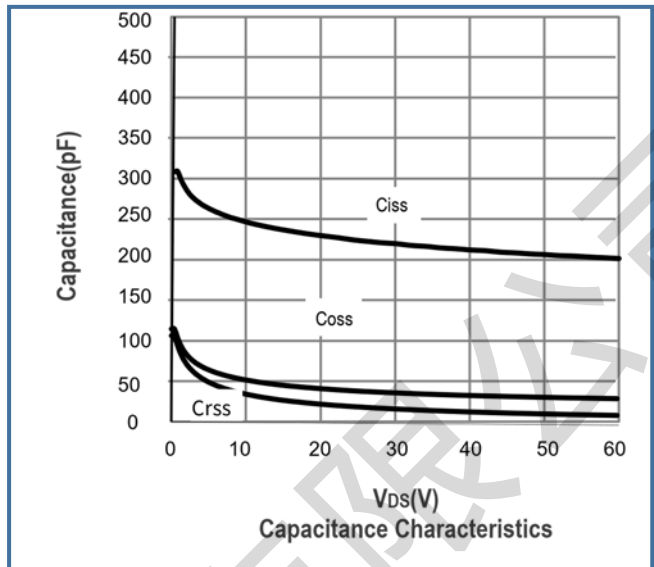
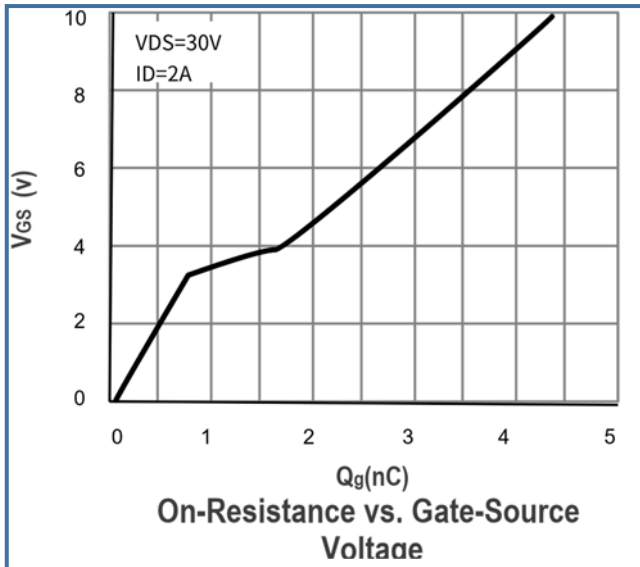
N-Channel Electrical Characteristics (TA=25°C, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V	-	-	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
• On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1.0	1.3	2.0	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =3.5A	-	85	120	mΩ
		V _{GS} =4.5V, I _D =1A	-	100	135	
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =3.5A		25		S
• Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1MHz	-	235	-	PF
C _{oss}	Output Capacitance		-	28	-	
C _{rss}	Reverse Transfer Capacitance		-	9	-	
• Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =30V, I _D =2A, V _{GS} =10V	-	4.4	-	nC
Q _{gs}	Gate-Source Charge		-	0.9	-	
Q _{gd}	Gate-Drain Charge		-	1.1	-	
t _{d(on)}	Turn-on Delay Time	V _{DD} =30V, R _L =15Ω, I _D =2A, V _{GEN} =10V, R _G =3Ω	-	4.5	-	nS
t _r	Turn-on Rise Time		-	1.5	-	
t _{d(off)}	Turn-off Delay Time		-	15	-	
t _f	Turn-off Fall Time		-	1.5	-	
• Drain-Source Diode Characteristics						
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V, I _S =3.5A	-	-	1.2	V
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1.4	-	Ω

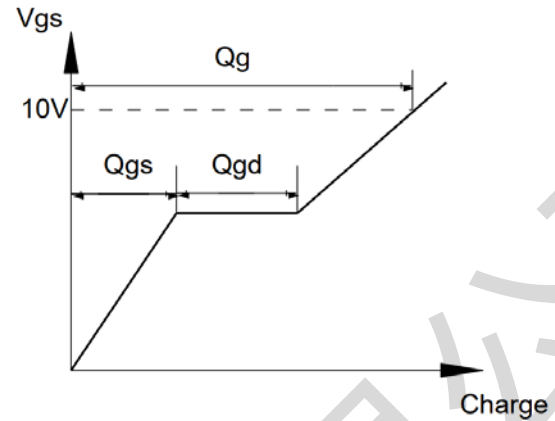
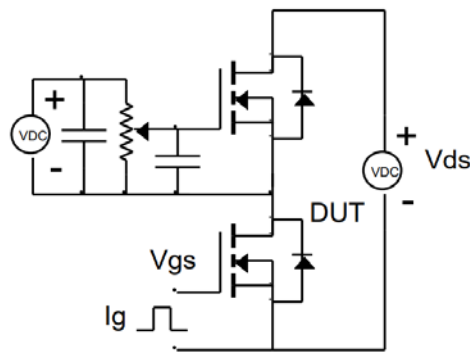
Note: Pulse Test: Pulse Width≤300us, Duty Cycle≤2%

N-Channel Typical Characteristics Curves (Ta=25°C, unless otherwise note)

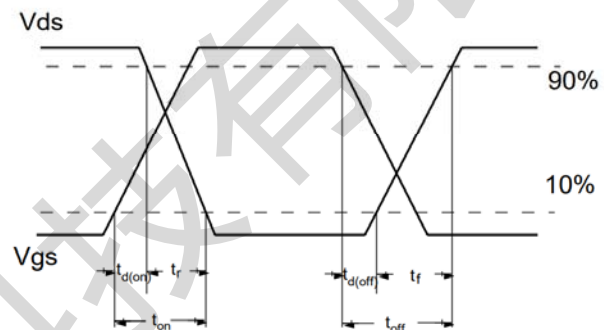
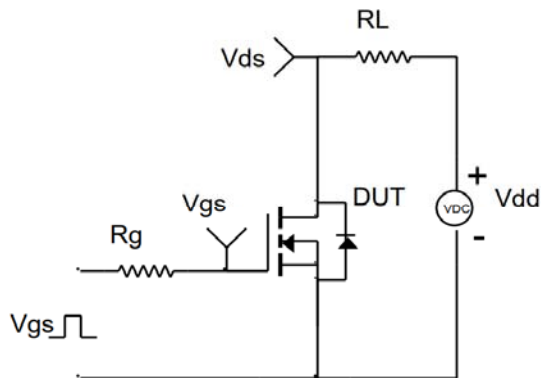




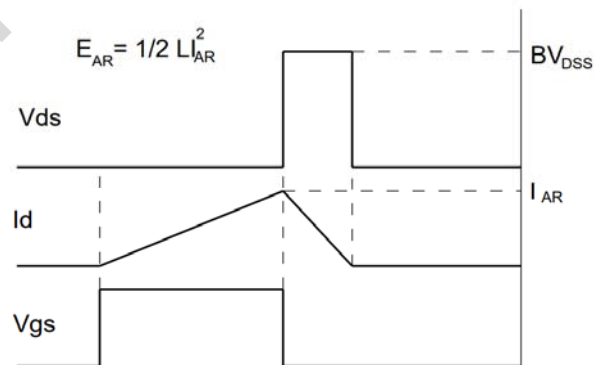
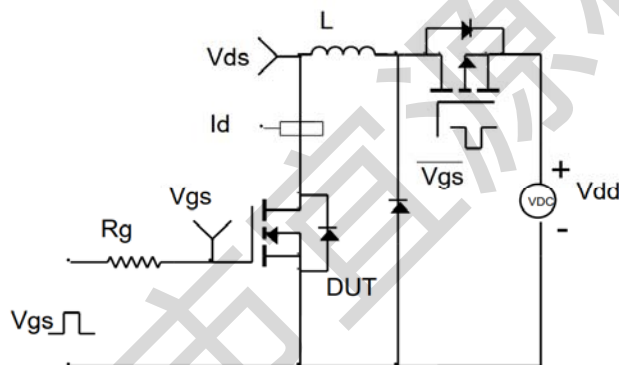
N Gate Charge Test Circuit & Waveforms



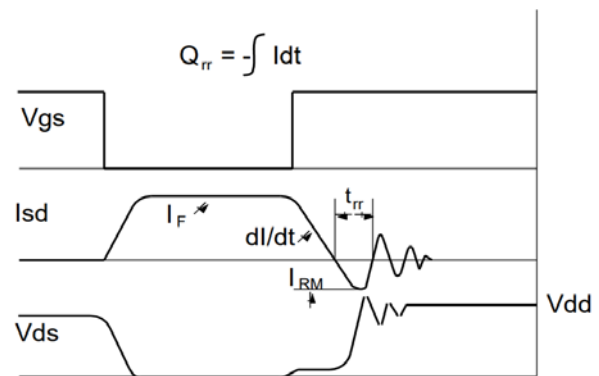
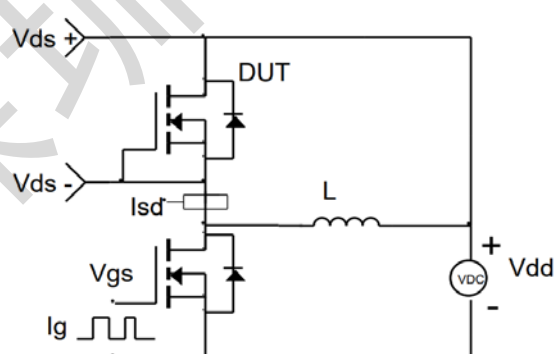
N Resistive Switching Test Circuit & Waveforms



N Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



N Diode Recovery Test Circuit & Waveforms

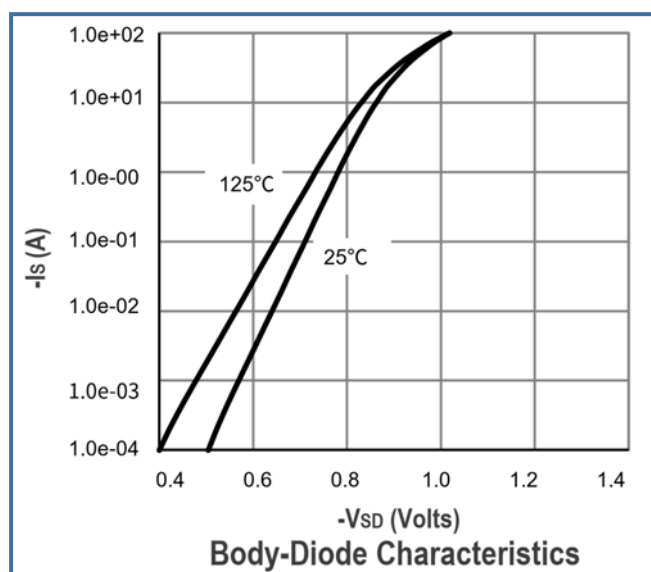
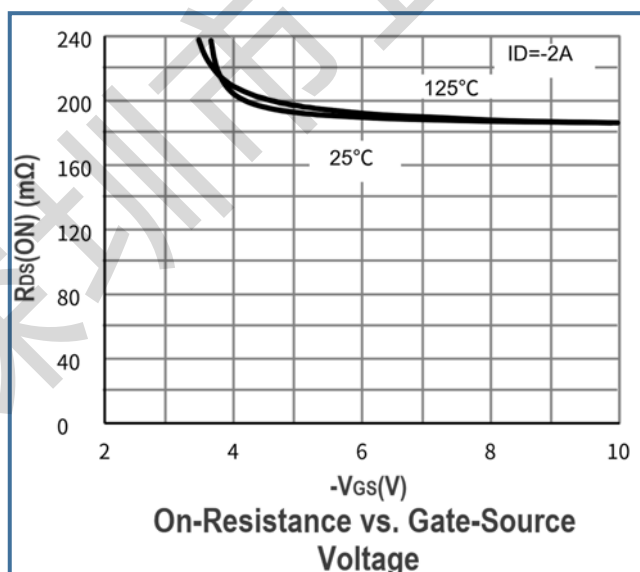
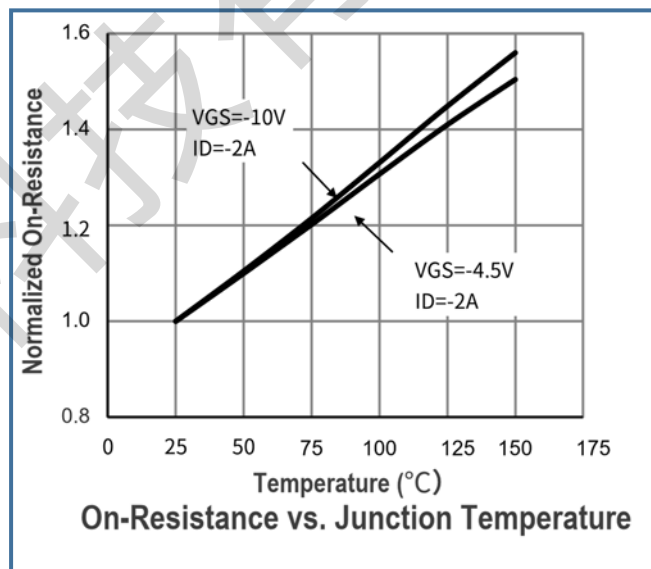
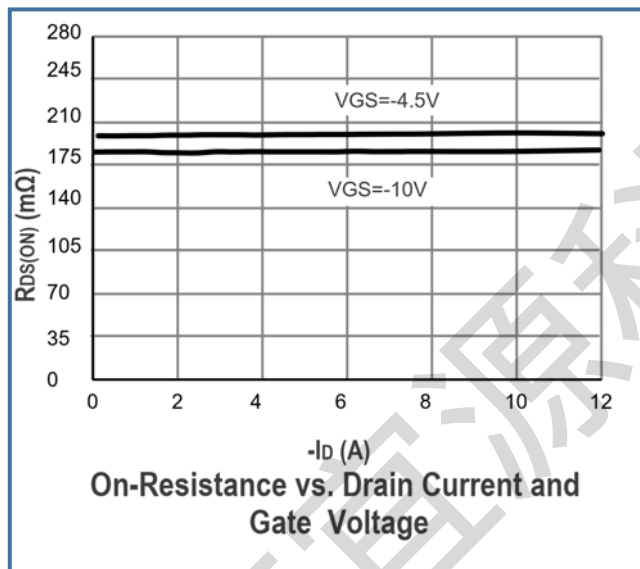
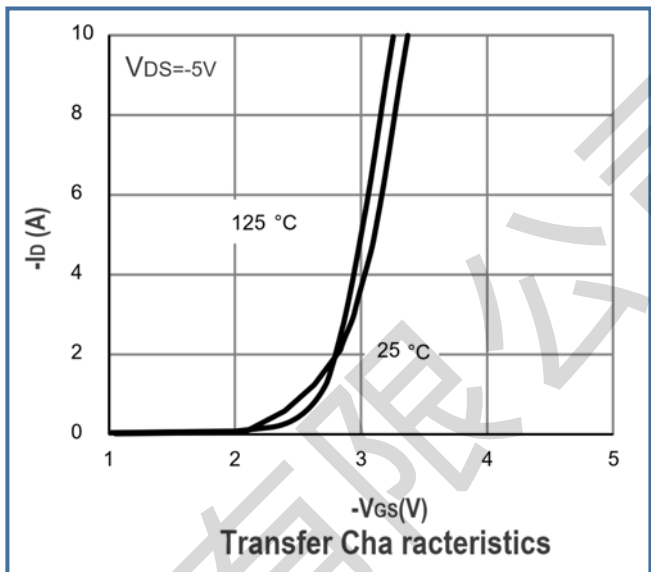
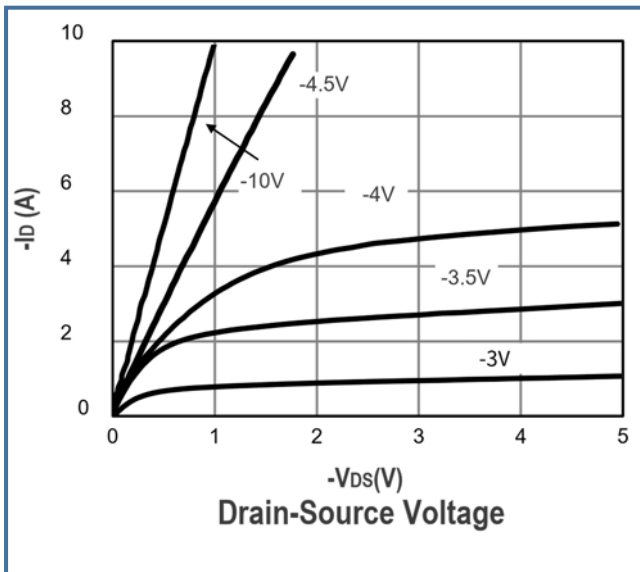


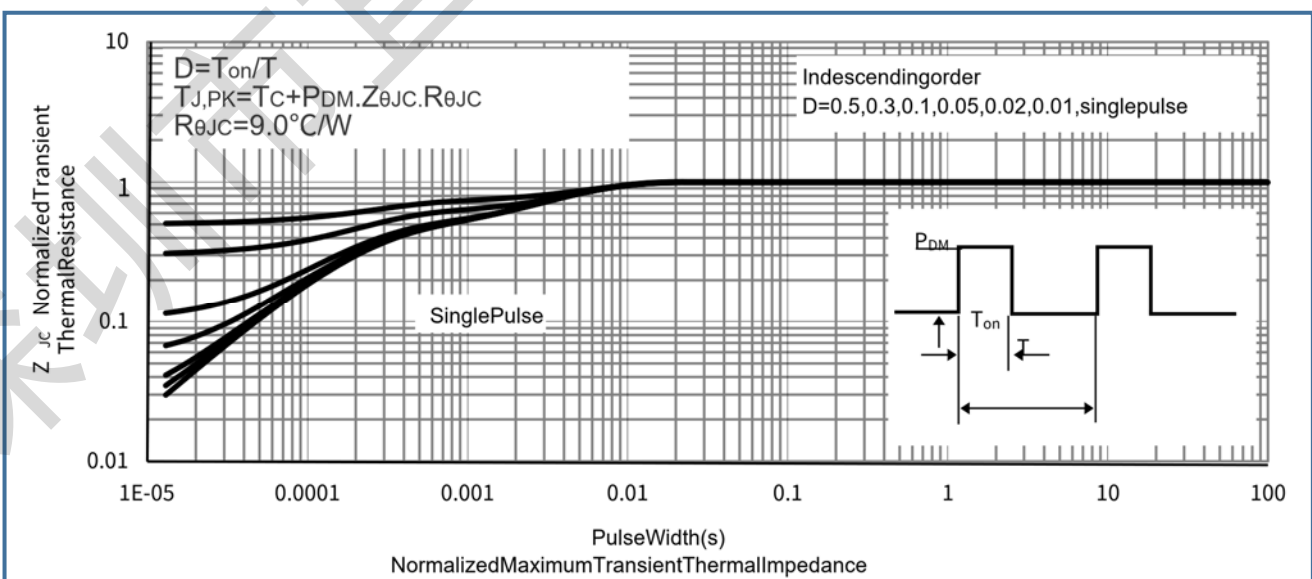
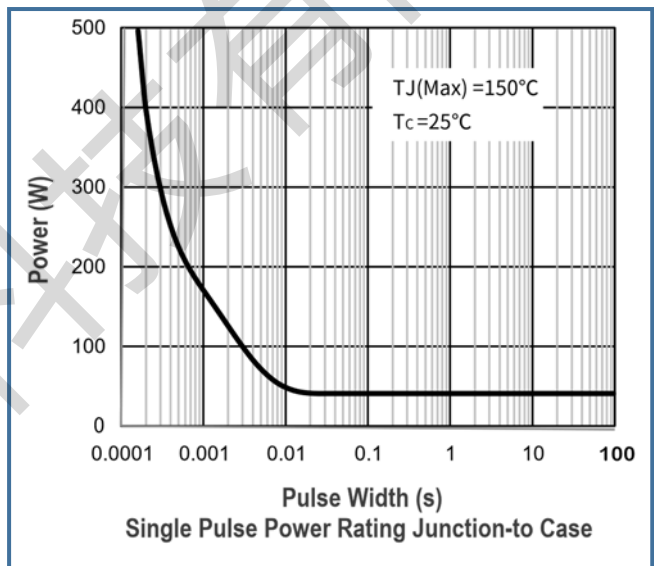
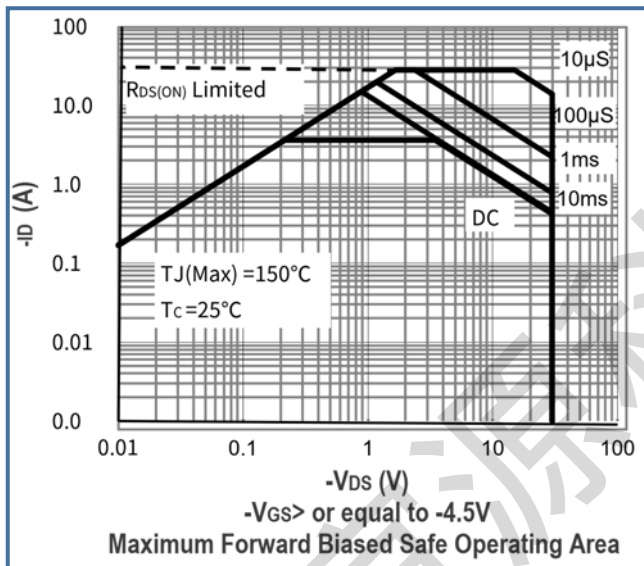
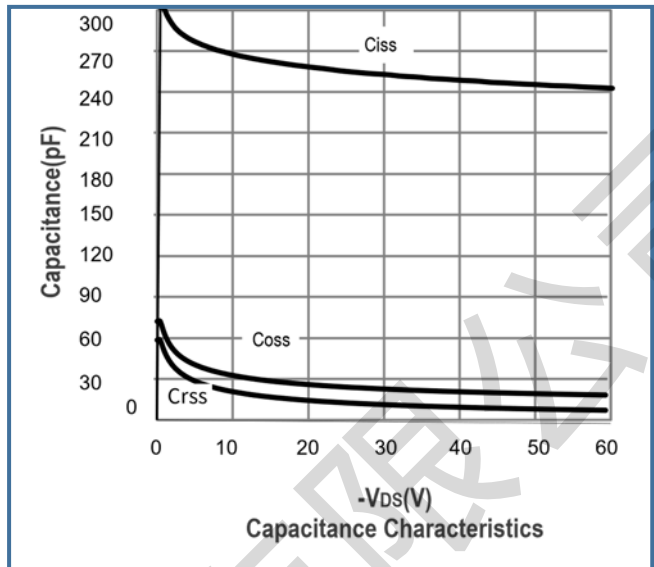
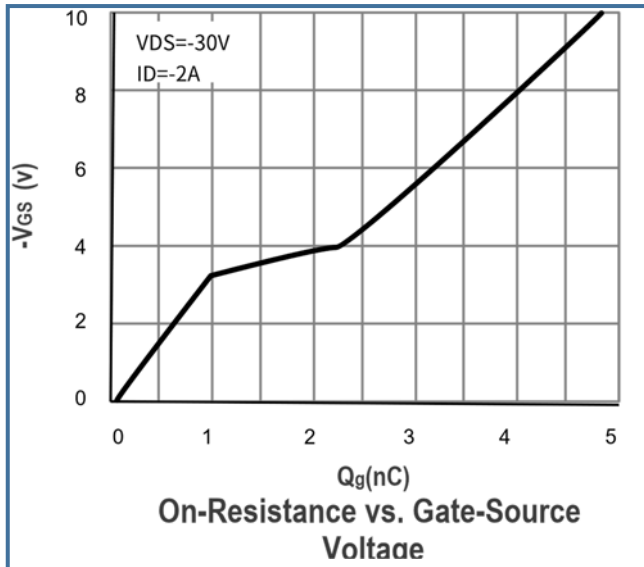
P-Channel Electrical Characteristics (TA=25°C, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-60V, V _{GS} =0V	-	-	-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
• On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	-1.0	-1.7	-2.0	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-2.6A	-	180	230	mΩ
		V _{GS} =-4.5V, I _D =-1A	-	190	260	
g _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-2.6A		8		S
• Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-30V, V _{GS} =0V, f=1MHz	-	265	-	PF
C _{oss}	Output Capacitance		-	27	-	
C _{rss}	Reverse Transfer Capacitance		-	9	-	
• Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =-30V, I _D =-2A, V _{GS} =-10V	-	4.6	-	nC
Q _{gs}	Gate-Source Charge		-	0.9	-	
Q _{gd}	Gate-Drain Charge		-	1.1	-	
t _{d(on)}	Turn-on Delay Time	V _{DD} =-30V, R _L =15Ω, I _D =-2A, V _{GEN} =-10V, R _G =3Ω	-	4.3	-	nS
t _r	Turn-on Rise Time		-	1.6	-	
t _{d(off)}	Turn-off Delay Time		-	16	-	
t _f	Turn-off Fall Time		-	1.5	-	
• Drain-Source Diode Characteristics						
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V, I _S =-2.6A	-	-	-1.2	V
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1.3	-	Ω

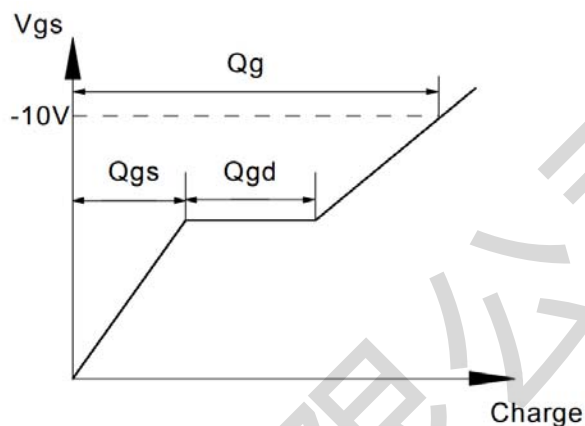
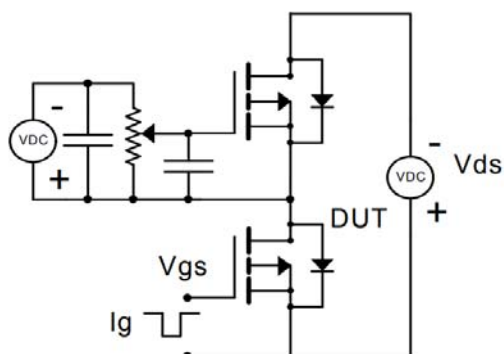
Note: Pulse Test: Pulse Width≤300us, Duty Cycle≤2%

P-Channel Typical Characteristics Curves (Ta=25°C, unless otherwise note)

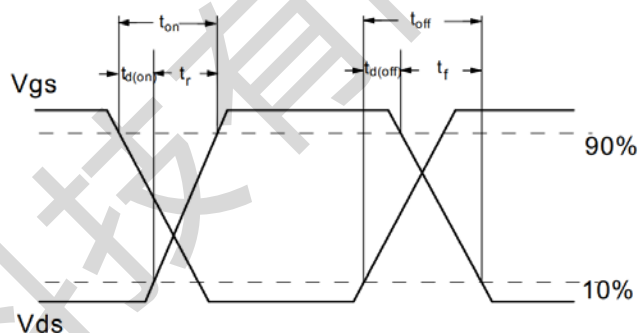
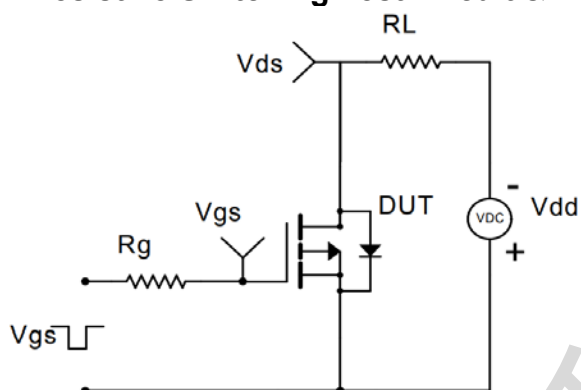




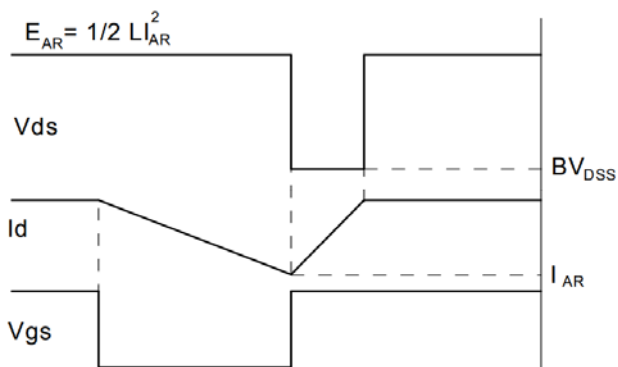
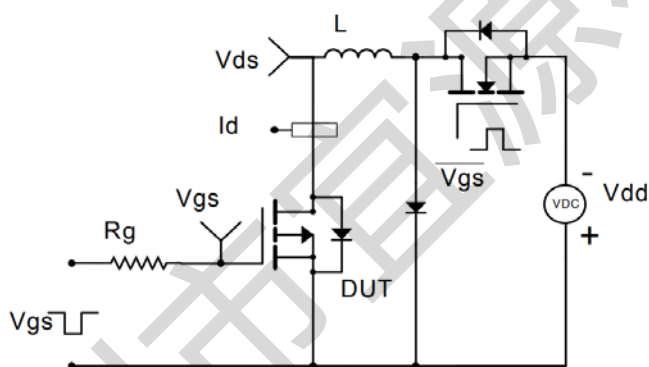
P Gate Charge Test Circuit & Waveforms



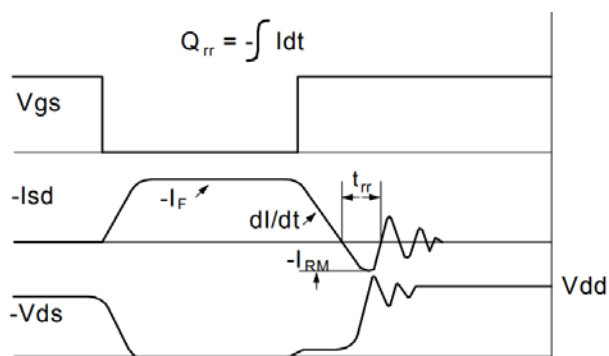
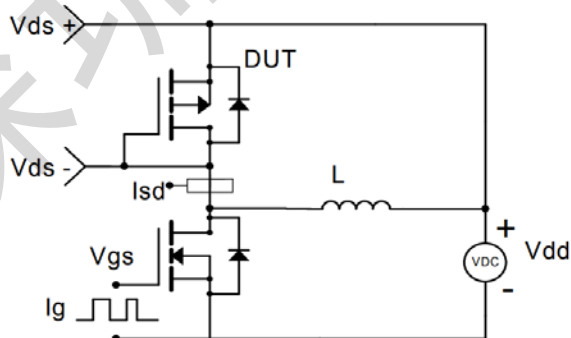
P Resistive Switching Test Circuit & Waveforms



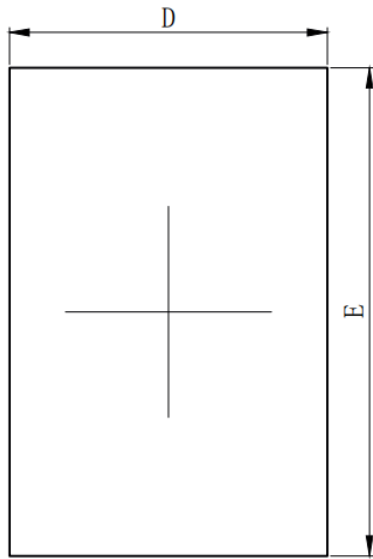
P Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



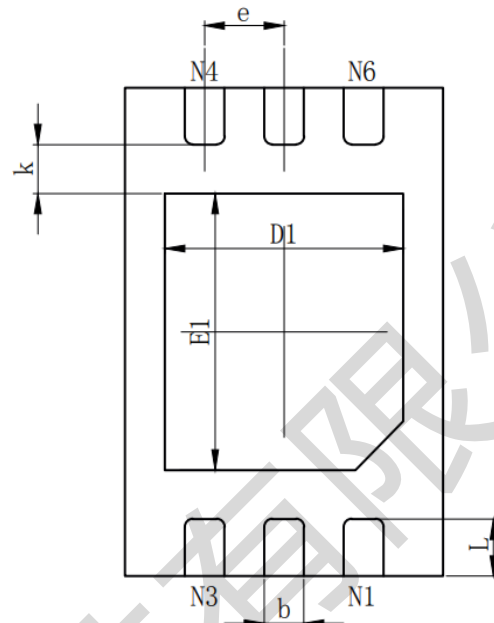
P Diode Recovery Test Circuit & Waveforms



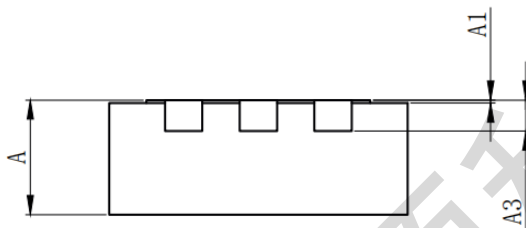
DFN2*3-6L Package Outline Data



TOPVIEW



BOTTOMVIEW



SIDEVIEW

Symbol	Dimensions (unit : mm)		
	Min	TYP	Max
A	0.700	0.750	0.800
A1	0.000	0.010	0.050
A3	0.203REF		
D	1.950	2.000	2.050
E	2.950	3.000	3.050
D1	1.450	1.500	1.550
E1	1.650	1.700	1.750
k	0.200min		
b	0.200	0.250	0.300
e	0.500TYP		
L	0.300		0.400