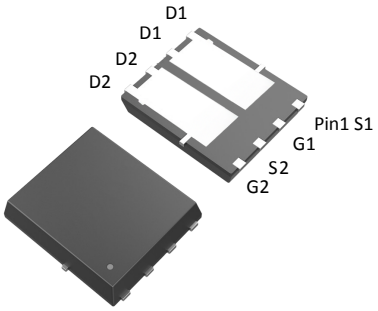
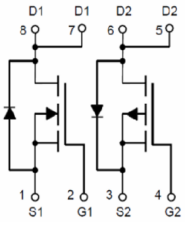
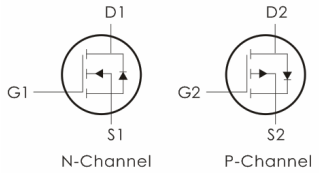
Description：

This N+P Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.







Features：

N-Channel:V_{DS}=30V,I_D=40A,$R_{DS(ON)}$<10mΩ @V_{GS}=10V（Typ：8mΩ）

P-Channel: V_{DS}=-30V,I_D=-30A,$R_{DS(ON)}$<18mΩ @V_{GS}=-10V（Typ：14mΩ）

1) Low gate charge.
2) Green device available.
3) Advanced high cell denity trench technology for ultra low $R_{DS(ON)}$.
4) Excellent package for good heat dissipation.
5) MSL3

Package Marking and Ordering Information：

Part NO.	Marking	Package	Packing
DON617	N617	DFN5*6-8D	5000 pcs/Reel

Absolute Maximum Ratings：(T_C=25℃ unless otherwise noted)

Symbol	Parameter	N-Channel	P-Channel	Units
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	±20	±20	V
I_D	Continuous Drain Current- T_C=25℃[1]	40	-30	A
	Continuous Drain Current-T_C=100℃[1]	28	-21	
I_{DM}	Pulsed Drain Current [2]	160	-120	A
E_{AS}	Single pulse avalanche energy[3]	46	51	
P_D	Power Dissipation - T_C=25℃	33.5	35	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150		℃

Thermal Characteristics：

Symbol	Parameter	N-CH	P-CH	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Cast	3.6	3.6	℃/W

N-Channel Electrical Characteristics: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=30V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1	---	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance[4]	V_{GS}=10V,I_D=20A	---	8	10	mΩ
		V_{GS}=4.5V,I_D=10A	---	12	15	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz	---	940	---	pF
C_{oss}	Output Capacitance		---	128	---	
C_{rss}	Reverse Transfer Capacitance		---	105	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=15V, I_D=15A, R_{ENG}=3.3Ω,V_{GS}=10V	---	4	---	ns
t_r	Rise Time		---	8	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	31	---	ns
t_f	Fall Time		---	4	---	ns
Q_g	Total Gate Charge	V_{GS}=4.5V, V_{DS}=15V, I_D=15A	---	9.8	---	nC
Q_{gs}	Gate-Source Charge		---	4.2	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	3.6	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_{SD}=1A	---	---	1	V
I_S	Continuous Drain Curren	V_D=V_G=0V	---	---	40	A
I_{SM}	Pulsed Drain Current		---	---	160	A
Trr	Reverse Recovery Time	I_F=30A,T_J=25℃ dI/dt=100A/us	---	8.5	---	ns
Qrr	Reverse Recovery Charge		---	2.2	---	nC

Notes:

1. Computed continuous current assumes the condition of $T_{j,Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. EAS condition : TJ=25℃,VDD=15V,V_G=10V,L=0.5mH
4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

N-Typical Characteristics： (T_C=25℃ unless otherwise noted)

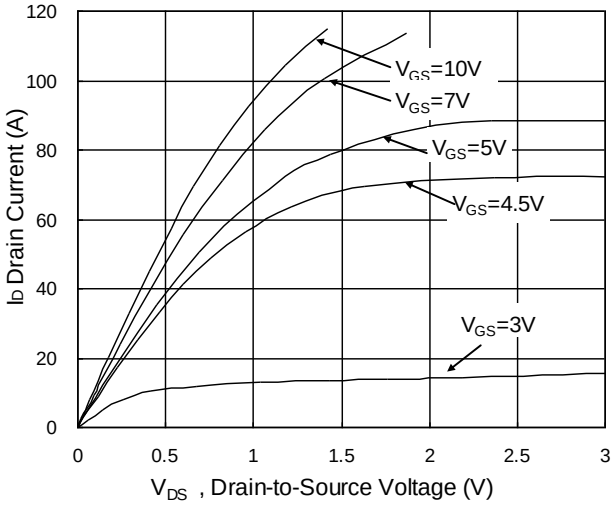


Fig.1 Typical Output Characteristics

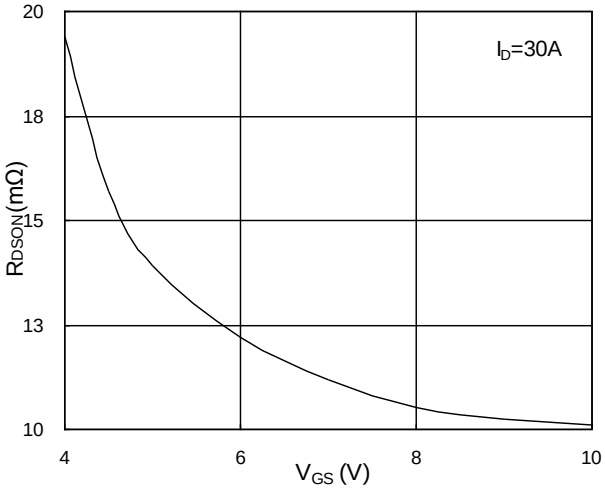


Fig.2 On-Resistance vs. G-S Voltage

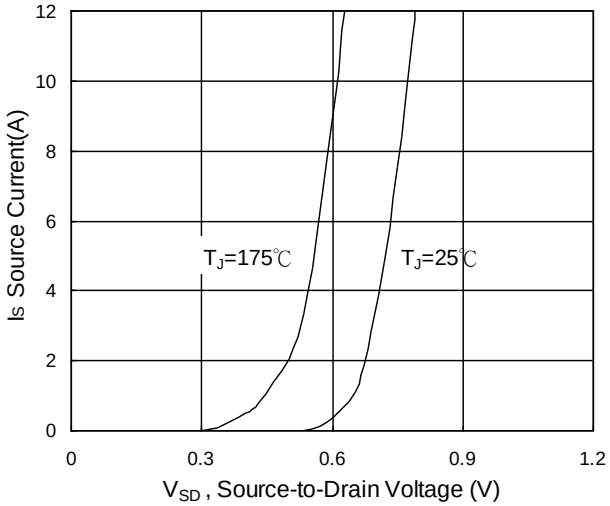


Fig.3 Forward Characteristics of Reverse

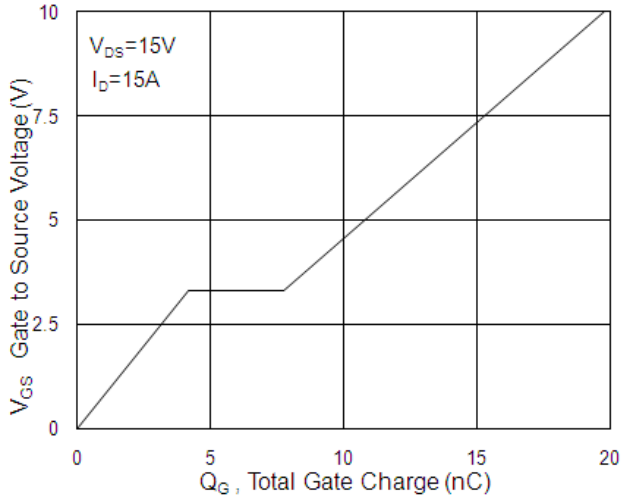


Fig.4 Gate-Charge Characteristics

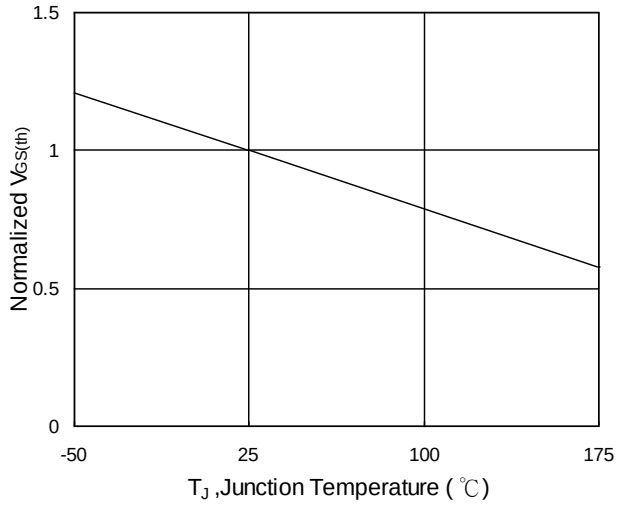


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

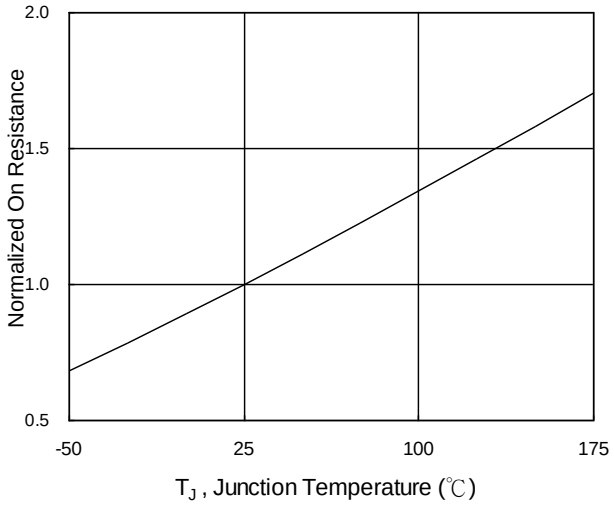


Fig.6 Normalized R_{DSON} vs. T_J

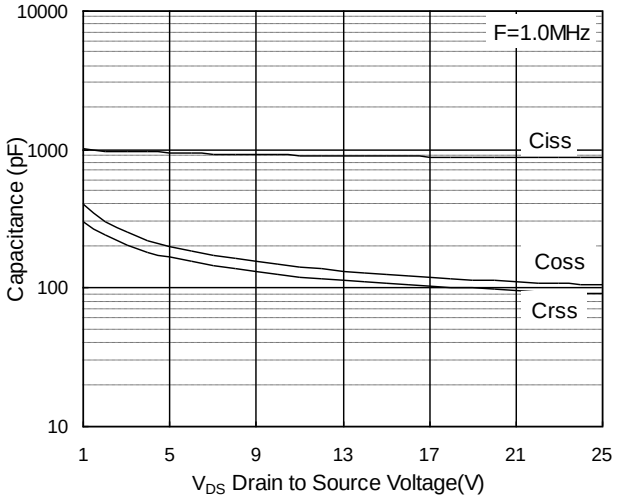


Fig.7 Capacitance

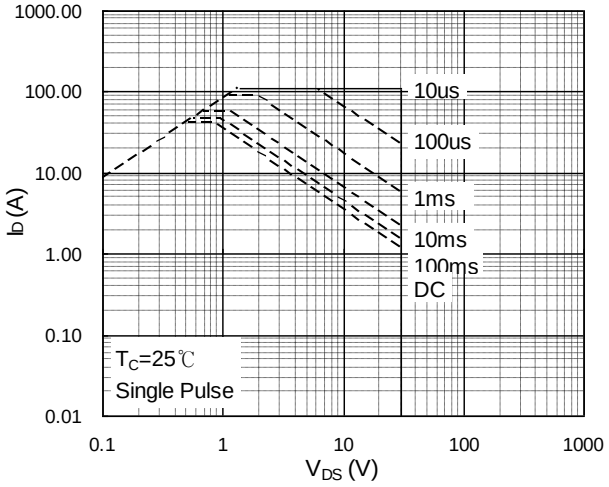


Fig.8 Safe Operating Area

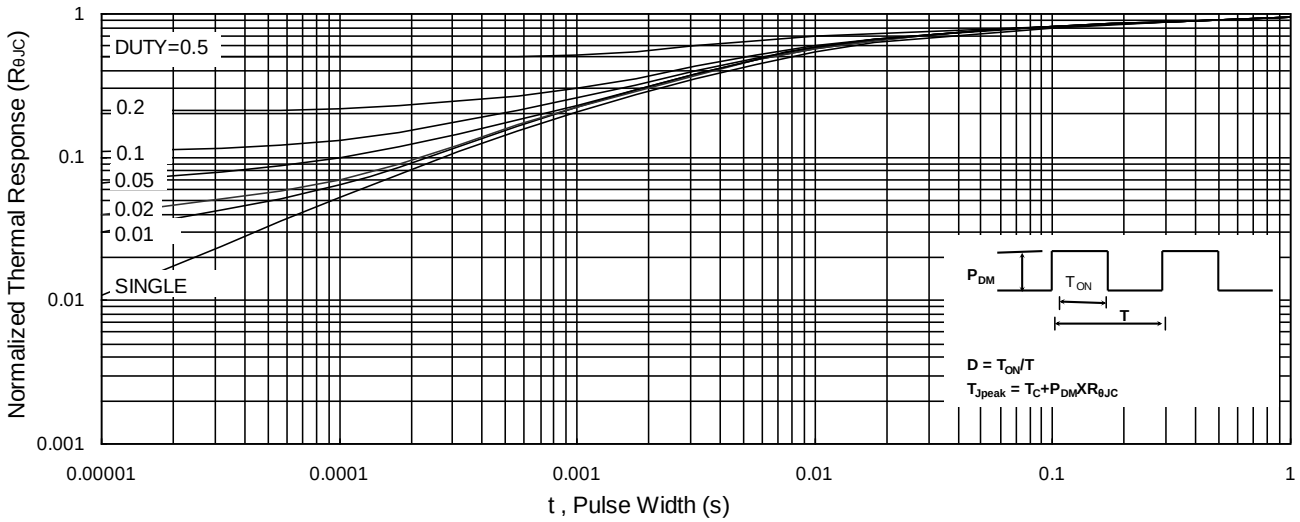


Fig.9 Normalized Maximum Transient Thermal Impedance

P-Channel Electrical Characteristics: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	-30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=-30V	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	-1	-1.7	-3	V
$R_{DS(ON)}$	Drain-Source On Resistance[4]	V_{GS}=-10V,I_D=-20A	---	14	18	mΩ
		V_{GS}=-4.5V,I_D=-10A	---	23	28	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz	---	1250	---	pF
C_{oss}	Output Capacitance		---	156	---	
C_{rss}	Reverse Transfer Capacitance		---	87	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}= -15V， I_D=-1A V_{GS}= -10V, R_{GEN}=6Ω	---	5.8	---	ns
t_r	Rise Time		---	18.8	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	46.9	---	ns
t_f	Fall Time		---	12.3	---	ns
Q_g	Total Gate Charge	V_{GS}=-4.5V,V_{DS}=-15V, I_D=-5A	---	11	---	nC
Q_{gs}	Gate-Source Charge		---	3.4	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	4.2	---	nC
Drain-Source Diode Characteristics						
I_S	Continuous Drain to Source Diode	V_D=V_G=0V	---	---	-30	A
I_{SM}	Pulsed Drain to Source Diode		---	---	-120	---
V_{SD}	Source-Drain Diode Forward Voltage	V_{GS}=0V,I_S=-1A	---	---	-1	V

Notes:

1. Computed continuous current assumes the condition of $T_{j,Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. EAS condition : TJ=25℃,VDD=-15V,V_G=-10V,L=0.5mH
4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

P-Typical Characteristics: (T_C=25℃ unless otherwise noted)

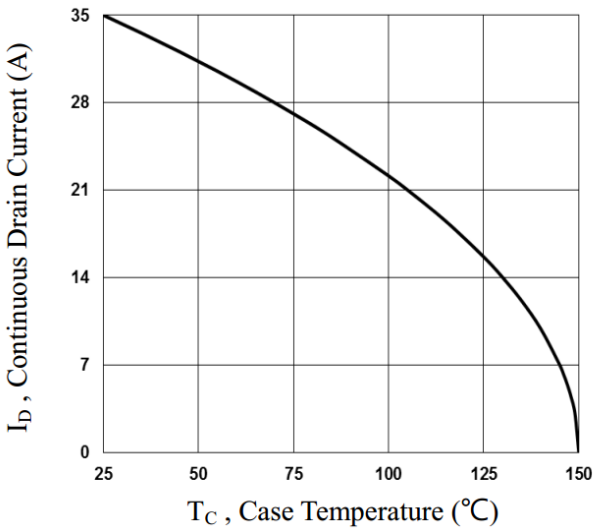


Fig.1 Continuous Drain Current vs. T_C

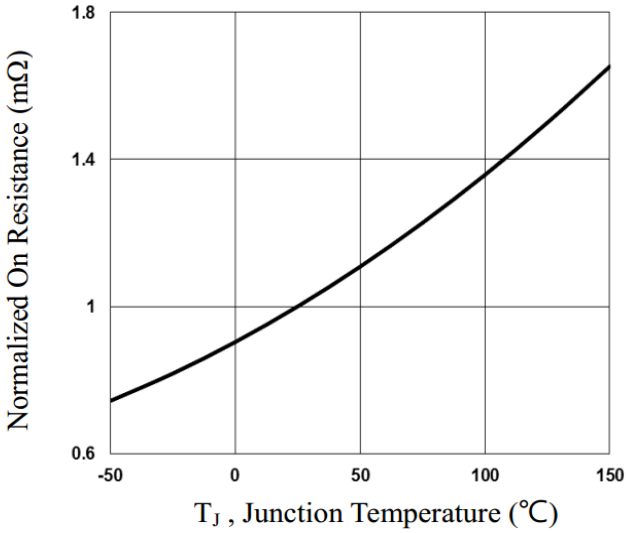


Fig.2 Normalized RDSON vs. T_J

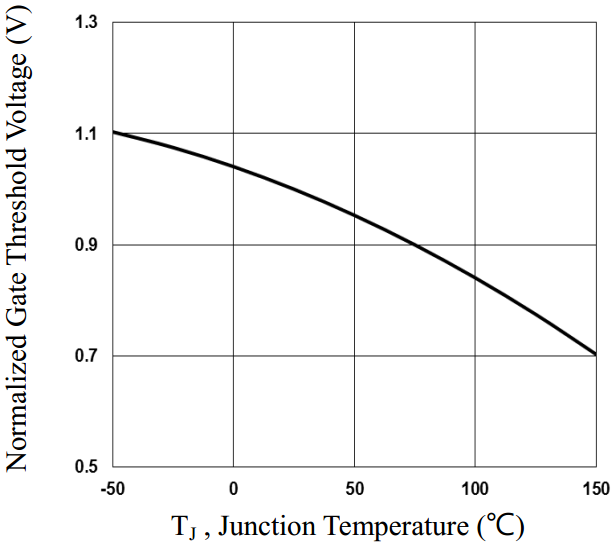


Fig.3 Normalized V_{th} vs. T_J

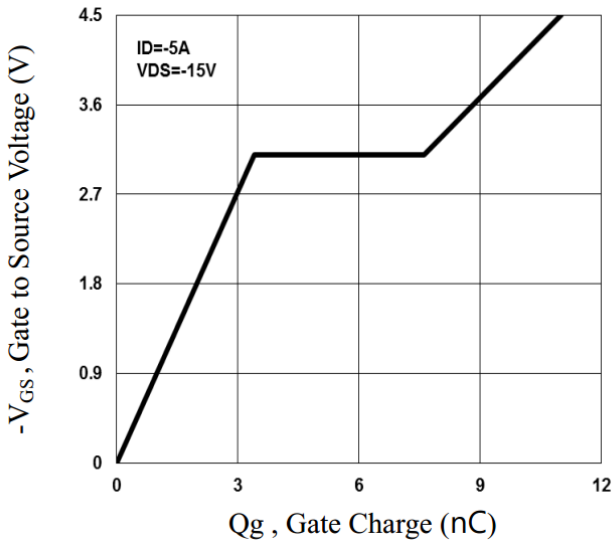


Fig.4 Gate Charge Waveform

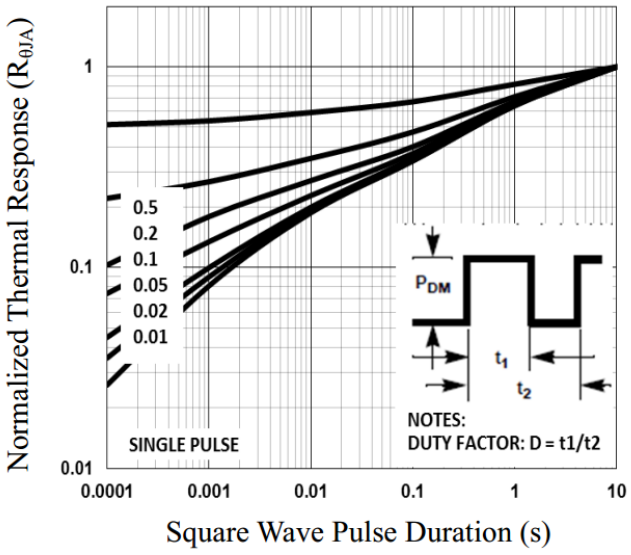


Fig.5 Normalized Transient Impedance

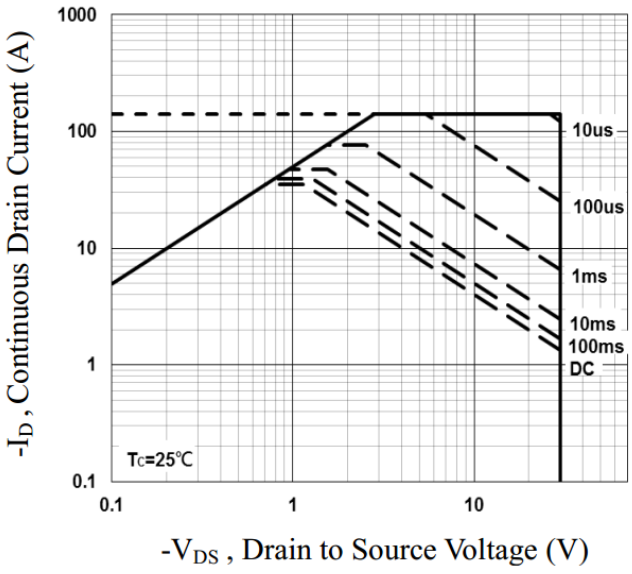


Fig.6 Maximum Safe Operation Area

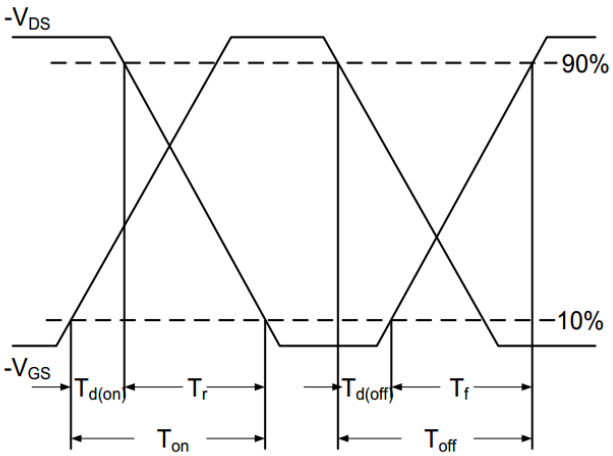


Fig.7 Switching Time Waveform

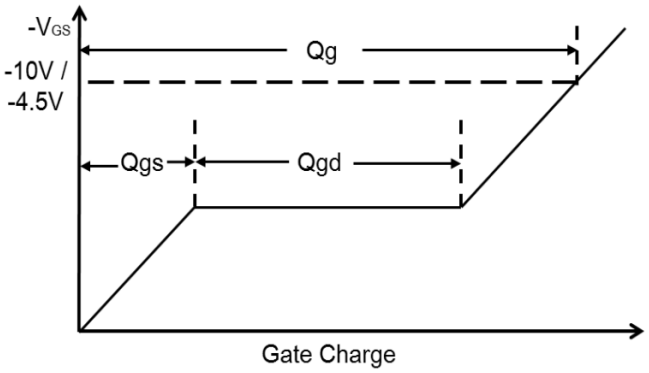
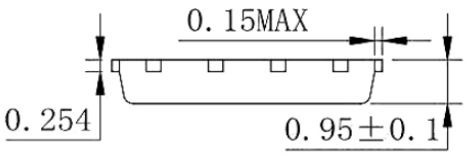
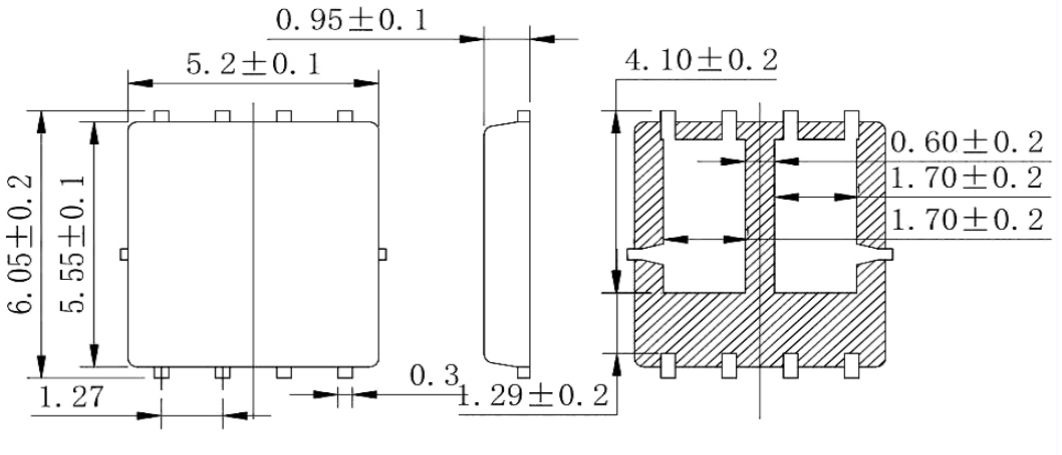


Fig.8 Gate Charge Waveform

DFN5×6-8D Package Information：

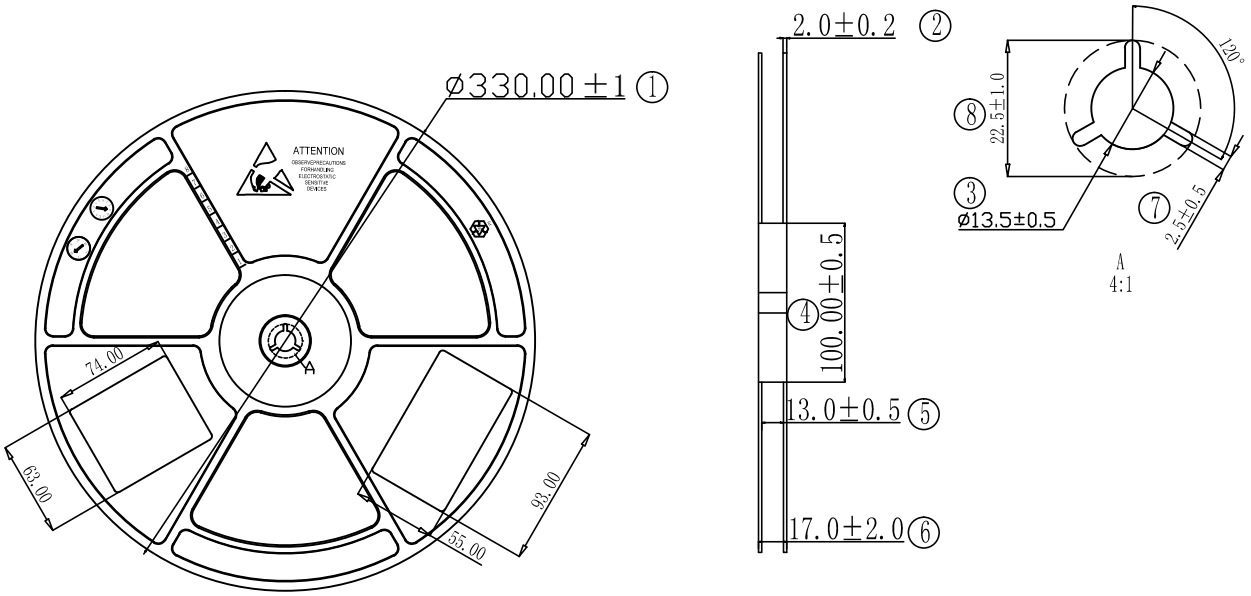


UNIT：mm

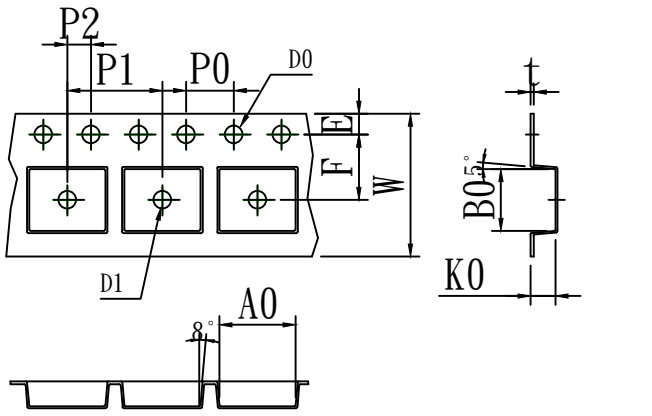


Tape & Reel Information

Dimensions in mm



Symbol	A0	B0	K0	D0	D1	P0	P1	10*P0
Spec	6.15±0.10	5.40±0.10	1.30±0.10	1.55±0.10	1.55±0.10	4.00±0.10	8.00±0.10	40.00±0.10
Symbol	W	E	F	P2	t			
Spec	12.00±0.10	1.75±0.10	5.50±0.10	2.00±0.10	0.20±0.05			



Marking Information：

①. Doingter LOGO

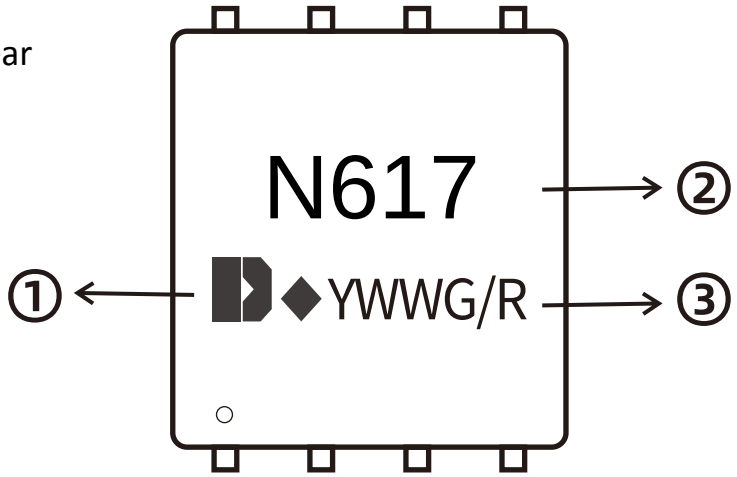
②. Part NO.

③. Date Code(YWWG / R)

Y：Year Code , last digit of the year

WW：Week Code(01-53)

G/R：G(Green) /R(Lead Free)



Previous Version

Version	Date	Subjects (major changes since last revision)
2.0	2025-02-09	Release of final version

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