

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: $V_{DS}=60V, I_D=15A, R_{DS(on)} < 27m\Omega @ V_{GS}=10V$ (Typ: $20.5m\Omega$)

P-Channel: $V_{DS}=-60V, I_D=-16A, R_{DS(on)} < 60m\Omega @ V_{GS}=-10V$ (Typ: $52m\Omega$)

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

5) MSL3

Package Marking and Ordering Information:

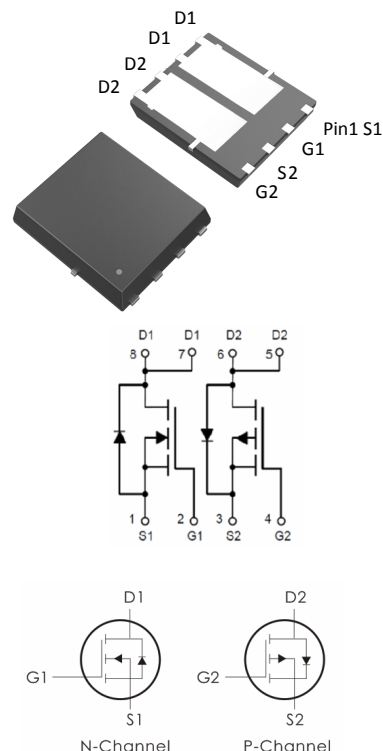
Part NO.	Marking	Package	Packing
DON603B	N603B	DFN5*6-8D	5000 pcs/Reel

Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	N-Channel	P-Channel	Units
V_{DS}	Drain-Source Voltage	60	-60	V
V_{GS}	Gate-Source Voltage	± 20	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ C^1$	15	-16	A
	Continuous Drain Current- $T_C=100^\circ C^1$	10.5	-11.2	
I_{DM}	Pulsed Drain Current ²	60	-64	A
E_{AS}	Single pulse avalanche energy ³	22	44	mJ
P_D	Power Dissipation - $T_C=25^\circ C$	21	28	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150		$^\circ C$

Thermal Characteristics:

Symbol	Parameter	N-CH	P-CH	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	6	4.5	$^\circ C/W$



N-Channel Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourctce Breakdown Voltage	V _{GS} =0V,I _D =250 μ A	60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =60V	---	---	1	μ A
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 =250 μ A	1.2	1.67	2.5	V
R _{DS(ON)}	Drain-Source On Resistance ⁴	V _{GS} =10V,I _D =10A	---	20.5	27	m Ω
		V _{GS} =4.5V,I _D =5A	---	27	35	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	950	---	pF
C _{OSS}	Output Capacitance		---	64	---	
C _{rss}	Reverse Transfer Capacitance		---	52	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =30V, I _D =20A, R _{ENG} =1.8 Ω ,V _{GS} =10V	---	7.9	---	ns
t _r	Rise Time		---	21	---	ns
t _{d(off)}	Turn-Off Delay Time		---	15.7	---	ns
t _f	Fall Time		---	25	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =30V, I _D =10A	---	20	---	nC
Q _{gs}	Gate-Source Charge		---	3.8	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	5.5	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =15A	---	---	1.2	V
I _S	Continuous Drain Current	V _D =V _G =0V	---	---	12.5	A
I _{SM}	Pulsed Drain Current		---	---	50	A

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 : $T_J=25^{\circ}C, V_{DD}=30V, V_G=10V, L=0.5mH$
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

N-Typical Characteristics: ($T_C=25^{\circ}C$ unless otherwise noted)

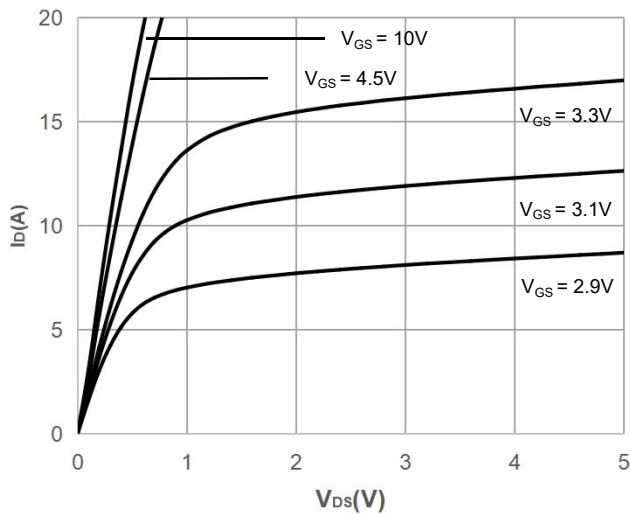


Figure 1: Output Characteristics

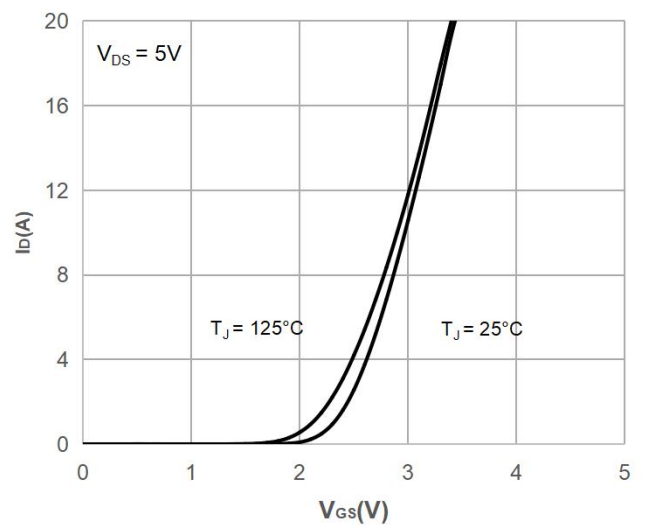


Figure 2: Typical Transfer Characteristics

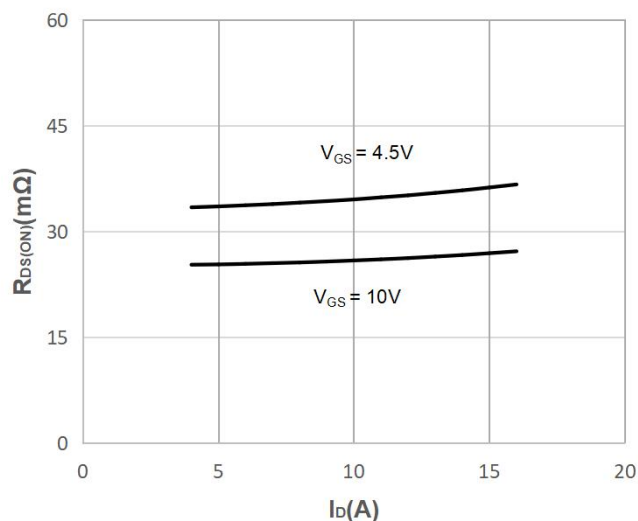


Figure 3: On-resistance vs. Drain Current

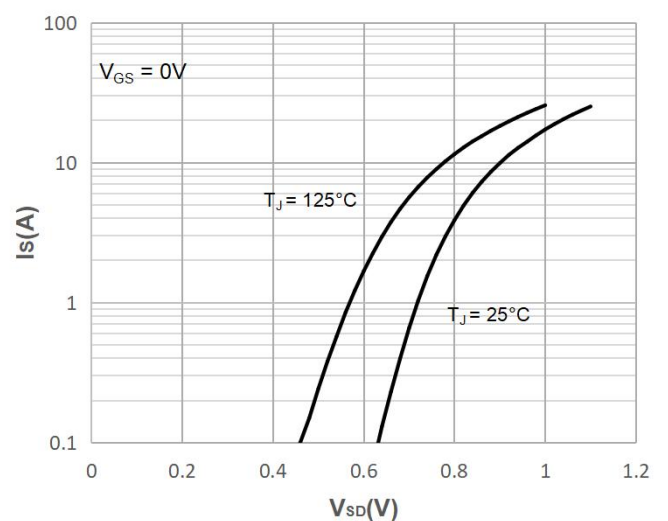


Figure 4: Body Diode Characteristics

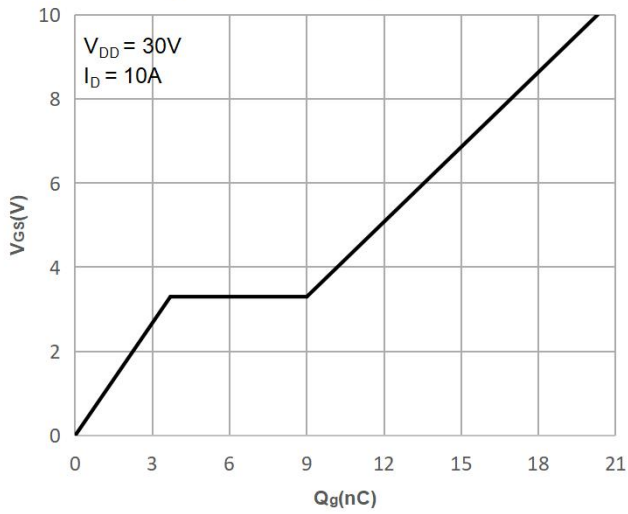


Figure 5: Gate Charge Characteristics

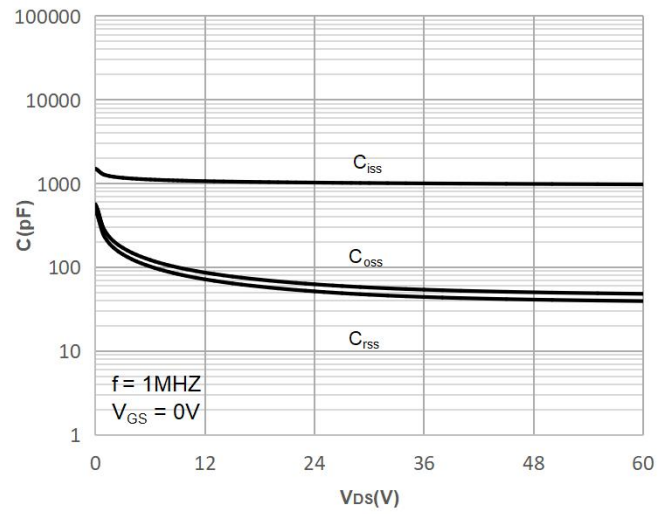


Figure 6: Capacitance Characteristics

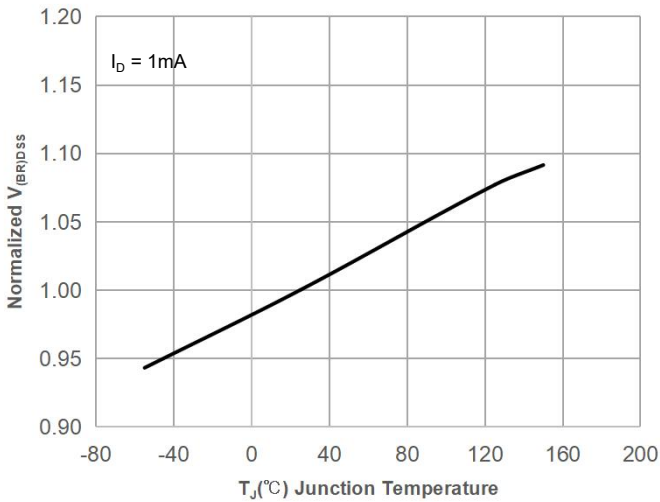


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

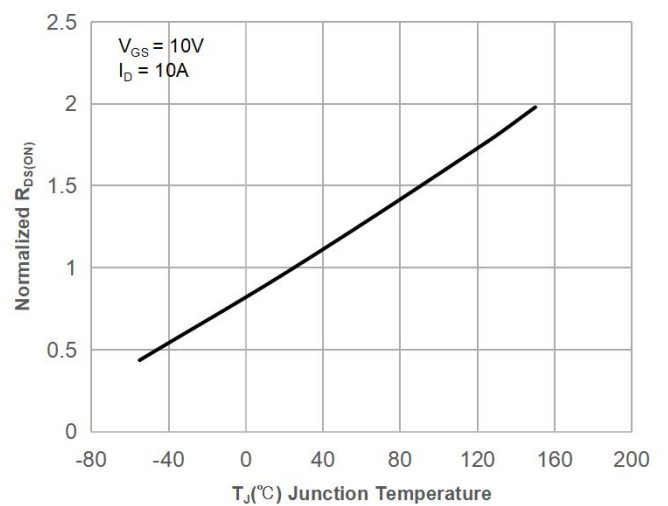


Figure 8: Normalized on Resistance vs. Junction Temperature

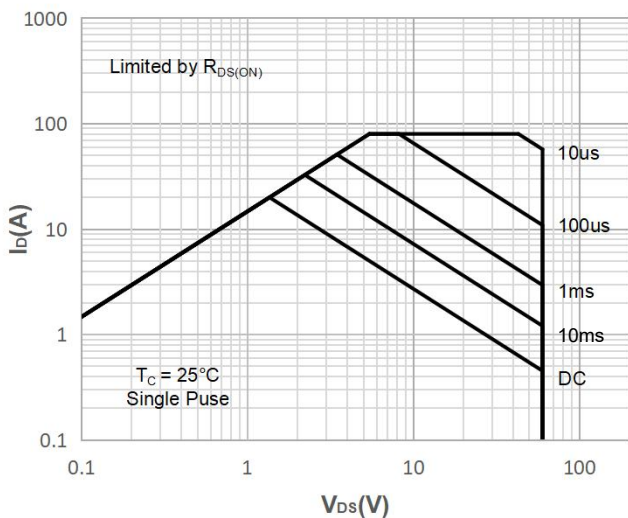


Figure 9: Maximum Safe Operating Area

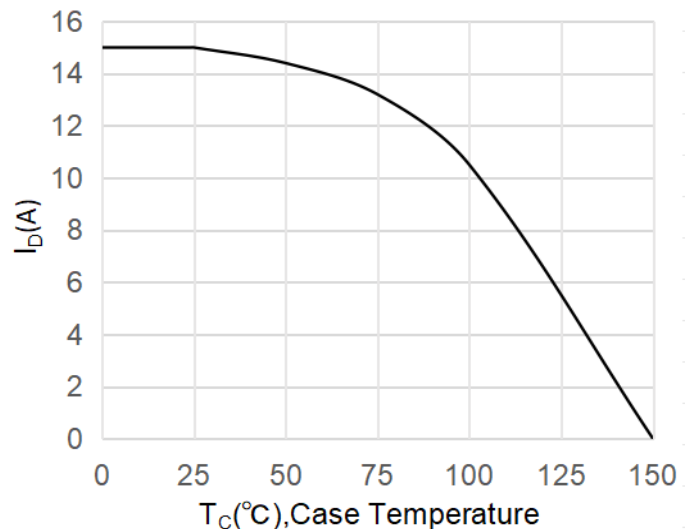


Figure 10: Maximum Continuous Driant Current vs. Case Temperature

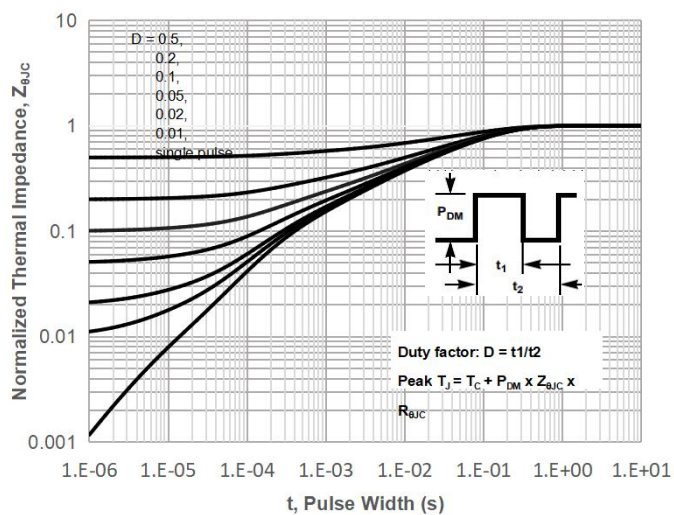


Figure 11: Normalized Maximum Transient Thermal Impedance

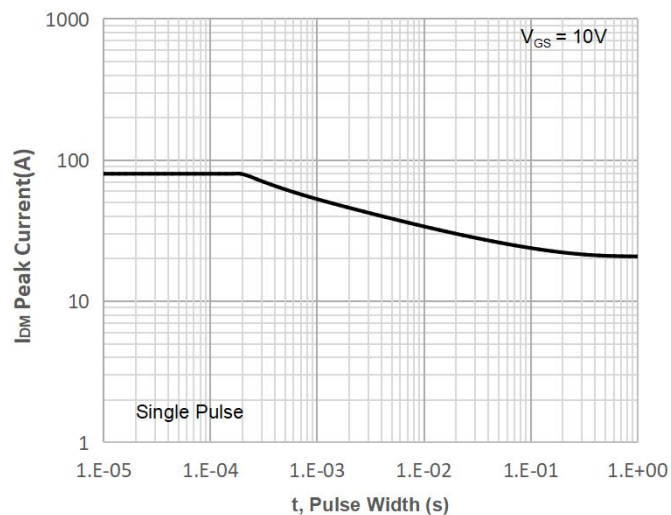


Figure 12: Peak Current Capacity

P-Channel Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	-60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-60V	---	---	-1	μ A
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 =250 μ A	-1	-1.6	-2.5	V
R _{DS(ON)}	Drain-Source On Resistance ⁴	V _{GS} =-10V, I _D =-10A	---	52	60	m Ω
		V _{GS} =-4.5V, I _D =-5A	---	65.5	70	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	1620	---	pF
C _{oss}	Output Capacitance		---	75	---	
C _{rss}	Reverse Transfer Capacitance		---	64	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} = -30V, I _D =-3A V _{GS} = -10V, R _{GEN} =3 Ω	---	12.6	---	ns
t _r	Rise Time		---	5.2	---	ns
t _{d(off)}	Turn-Off Delay Time		---	47	---	ns
t _f	Fall Time		---	8.4	---	ns
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-30V, I _D =-3A	---	30	---	nC
Q _{gs}	Gate-Source Charge		---	6.3	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	7.3	---	nC
Drain-Source Diode Characteristics						
I _S	Continuous Drain to Source Diode	V _D =V _G =0V	---	---	-13.3	A
I _{SM}	Pulsed Drain to Source Diode		---	---	-53.3	---
T _{rr}	Reverse Recovery Time	I _F =-3A, T _J =25 °C	---	-26	---	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/us	---	-32	---	nC
V _{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =-3A	---	---	-1.2	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 : $T_J=25^{\circ}C, V_{DD}=-30V, V_G=-10V, L=1mH$
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

P-Typical Characteristics: ($T_C=25^{\circ}C$ unless otherwise noted)

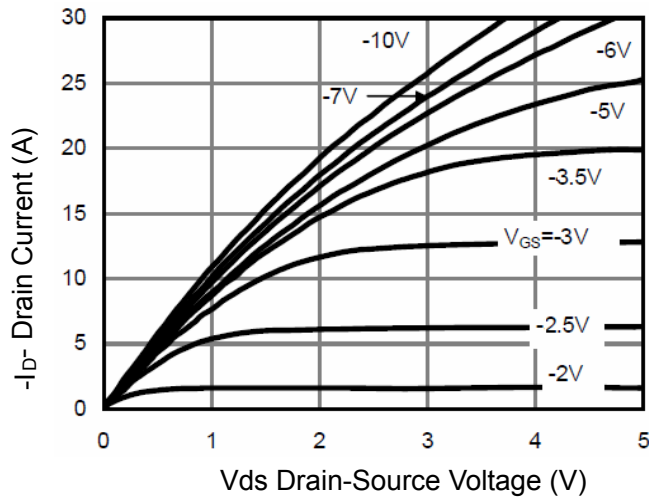


Figure 1 Output Characteristics

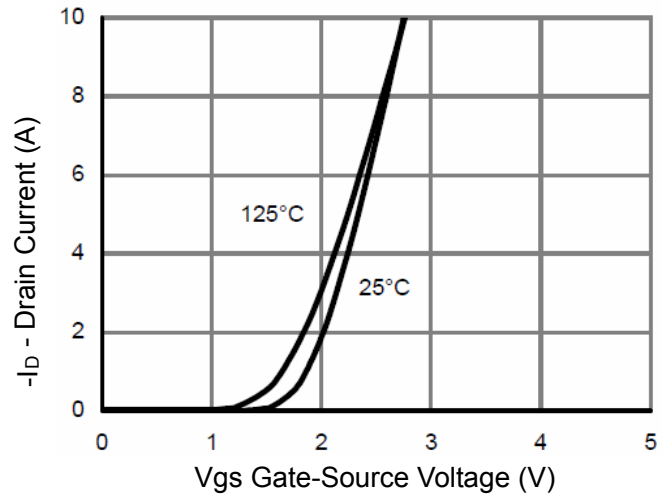


Figure 2 Transfer Characteristics

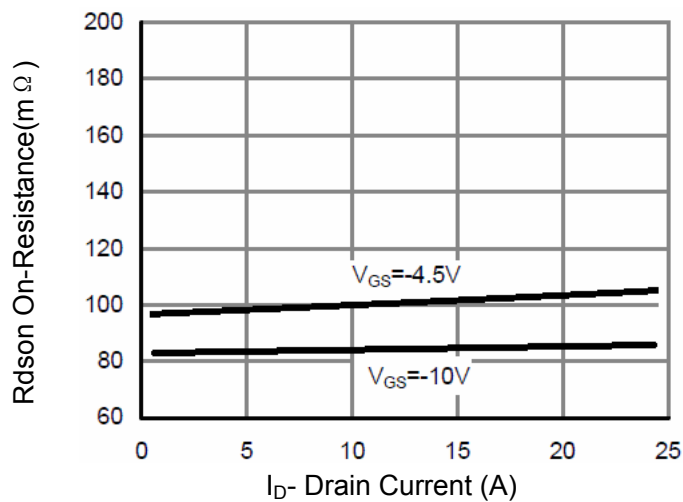


Figure 3 Rdson- Drain Current

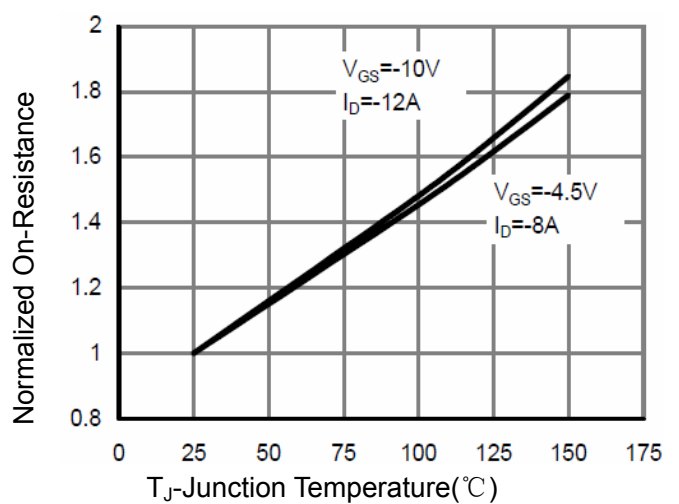


Figure 4 Rdson-Junction Temperature

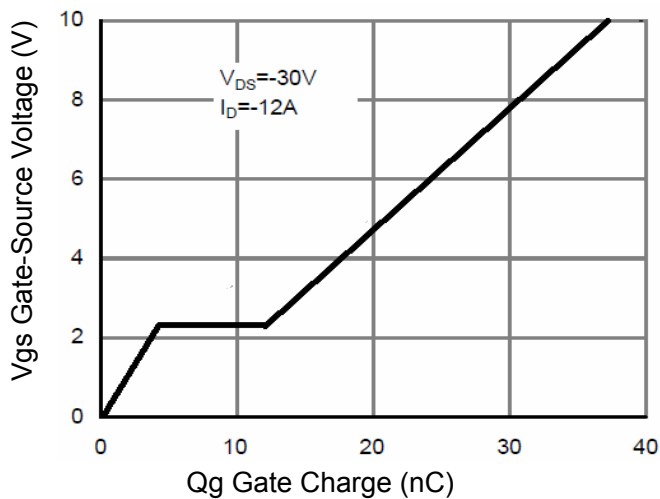


Figure 5 Gate Charge

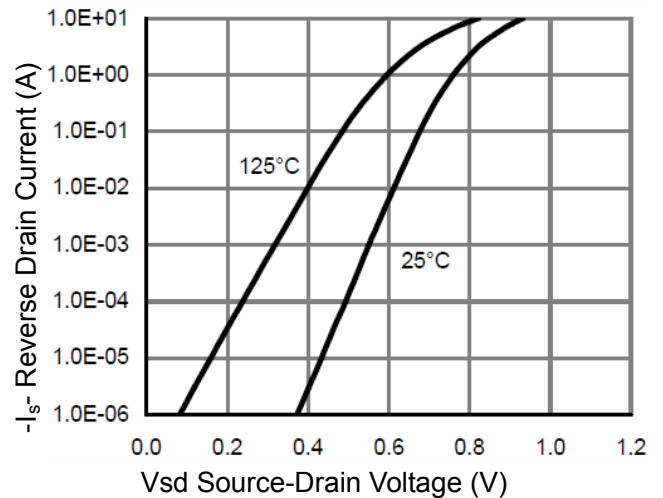


Figure 6 Source- Drain Diode Forward

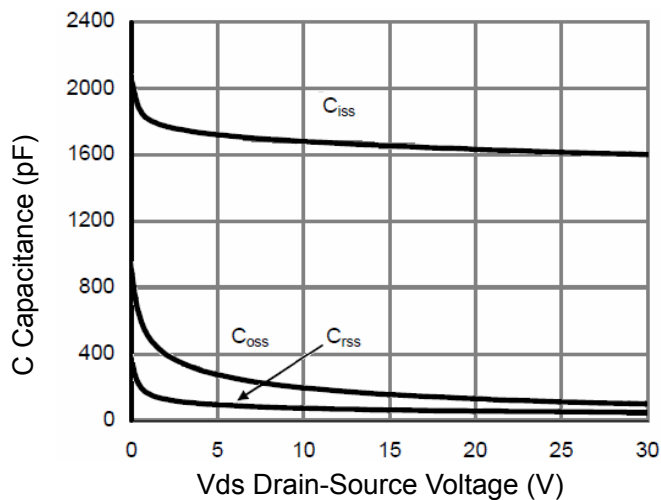


Figure 7 Capacitance vs Vds

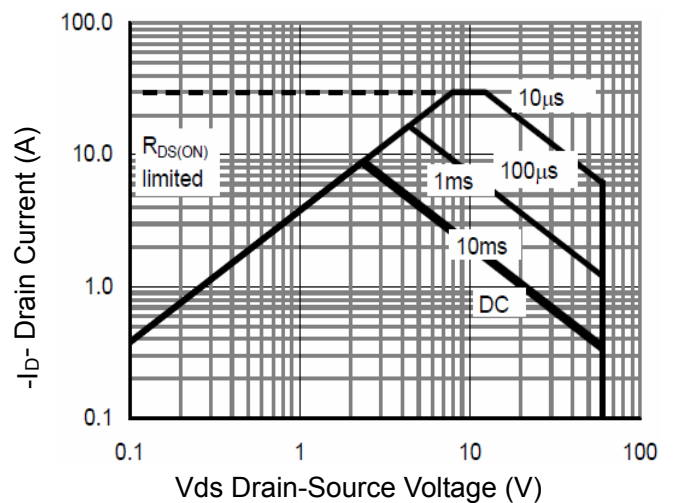


Figure 8 Safe Operation Area

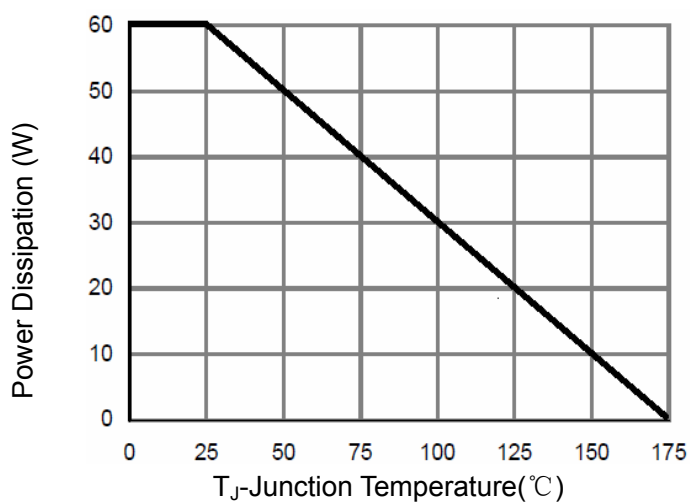


Figure 9 Power De-rating

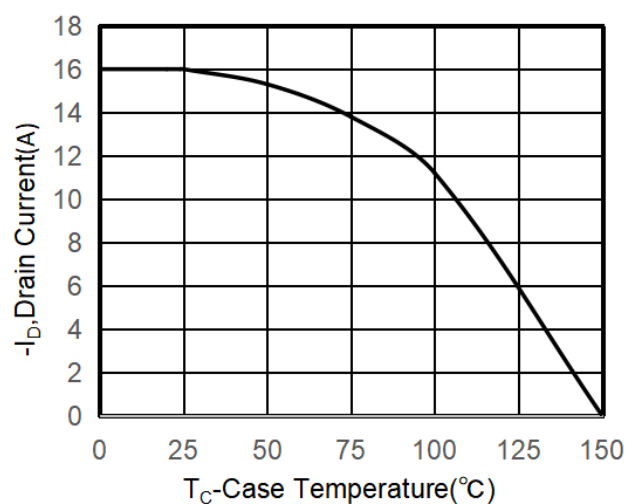


Figure 10 ID Current De-rating

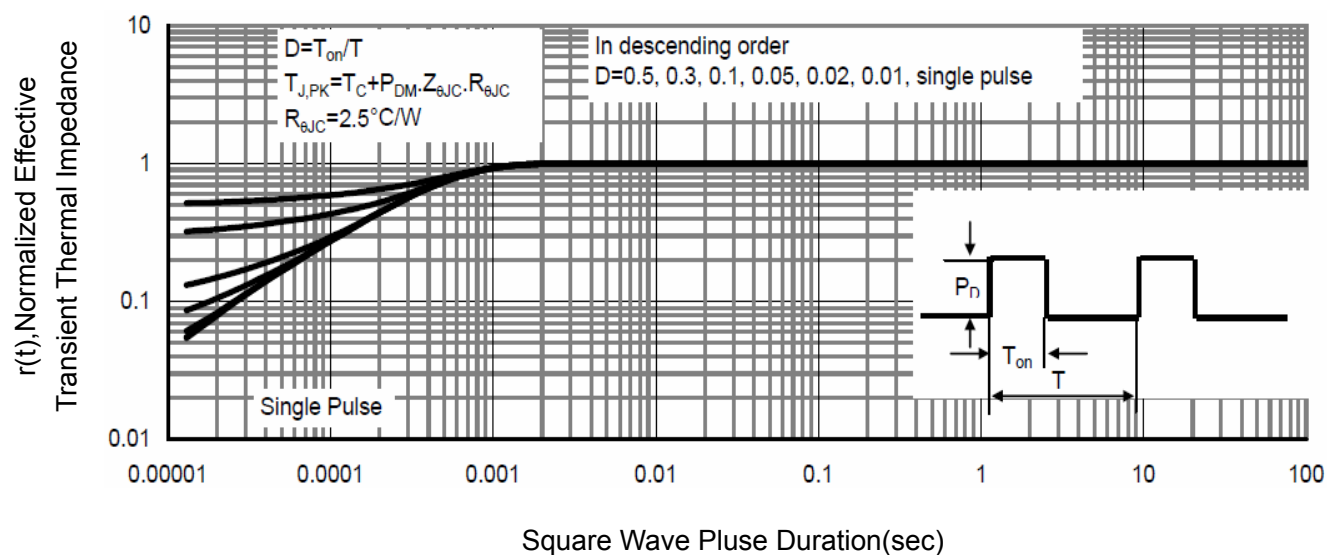
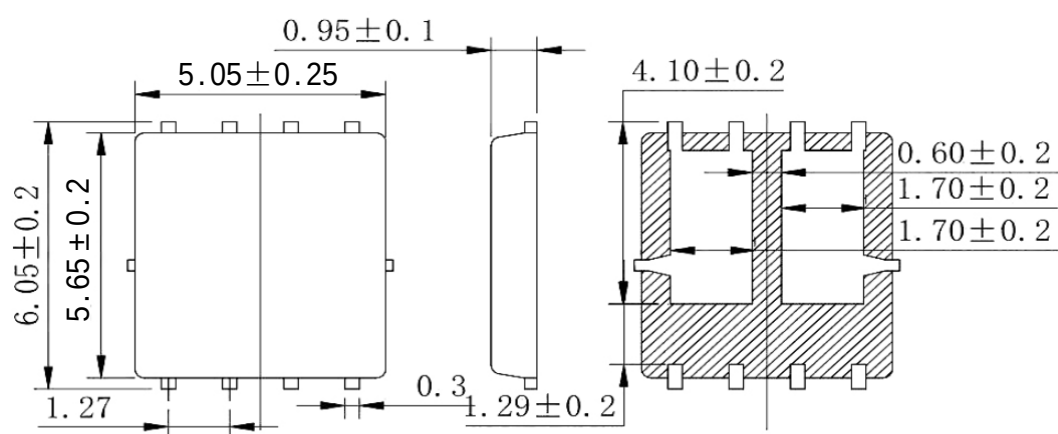
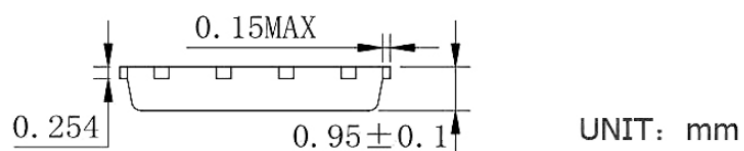


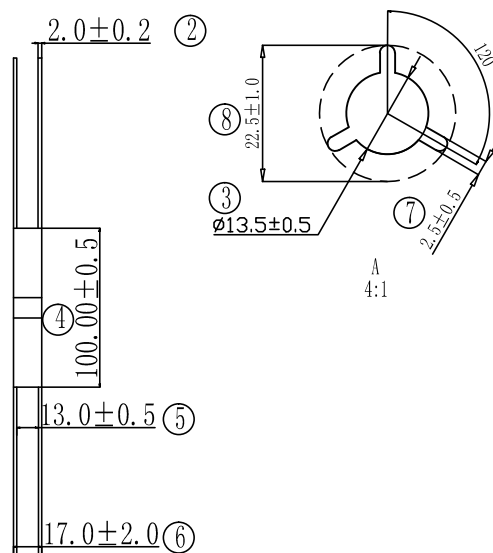
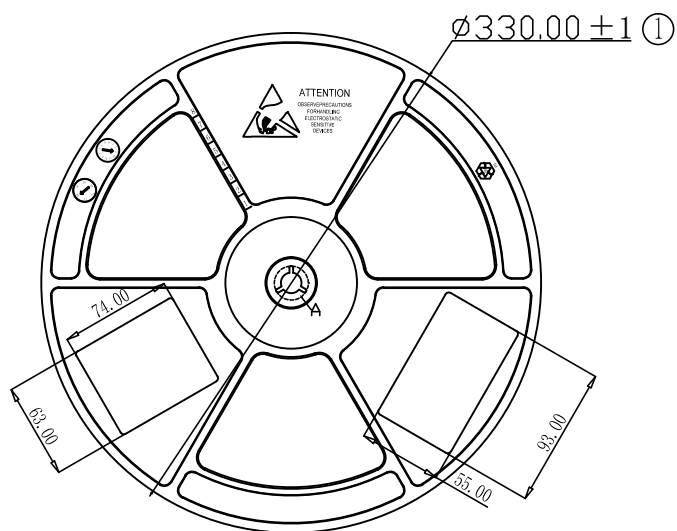
Figure 11 Normalized Maximum Transient Thermal Impedance

DFN5×6-8D Package Information:

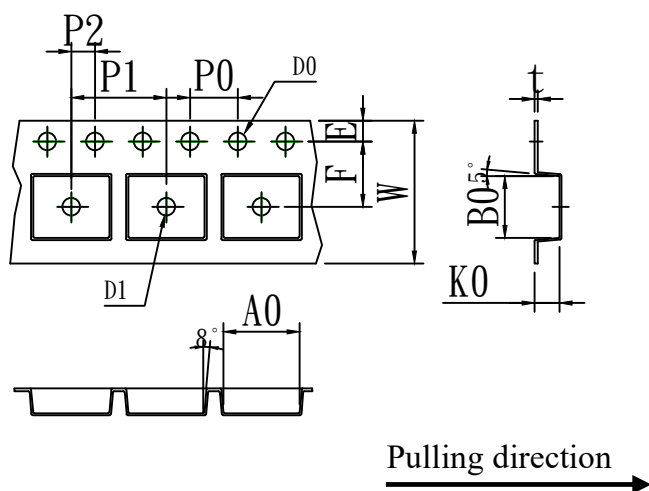


Tape & Reel Information

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

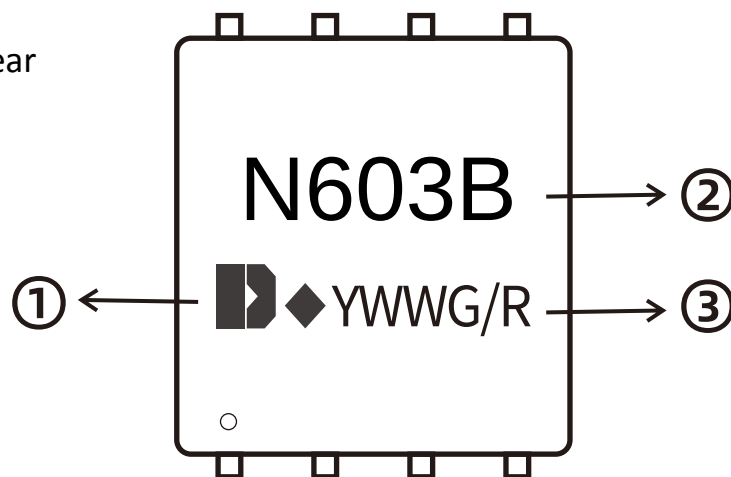
②. Part NO.

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)
1.0	2026-04-02	Release of final version

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