

Description:

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

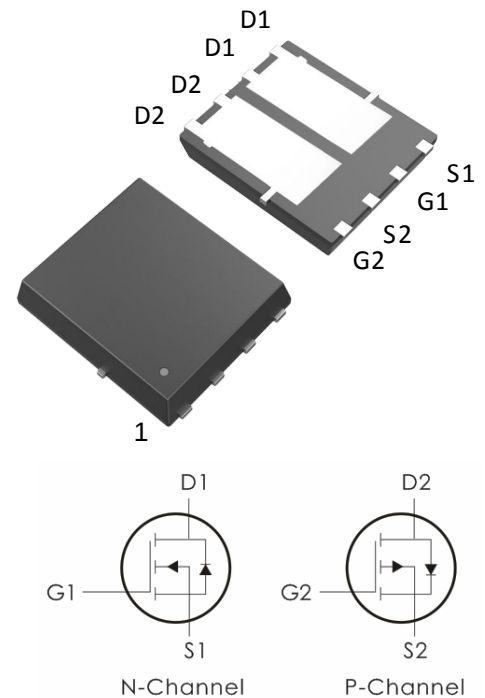
It can be used in a wide variety of applications.

Features:

N-Channel: $V_{DS}=30V, I_D=15A, R_{DS(on)} < 22\text{ m}\Omega @ V_{GS}=10V$ (Typ: $18\text{ m}\Omega$)

P-Channel: $V_{DS}=-30V, I_D=-15A, R_{DS(on)} < 33\text{ m}\Omega @ V_{GS}=-10V$ (Typ: $28\text{ m}\Omega$)

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



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
DON607	N607	DFN5*6-8D	5000 pcs/Reel

Absolute Maximum Ratings: ($T_c=25^\circ\text{C}$ 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 $T_C=25^\circ\text{C}$	15	-15	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	10	-10	
I_{DM}	Pulsed Drain Current ¹	40	-55	
EAS	Single Pulse Avalanche Energy ²	20	36	mJ
P_D	Power Dissipation	18	26	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150		$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	N-Max	P-Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	6.9	4.8	$^\circ\text{C}/\text{W}$

N-CH 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	30	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-30V	---	---	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	2.4	V
R _{DS(ON)}	Drain-Source On Resistance ³	V _{GS} =10V, I _D =8A	---	18	22	m Ω
		V _{GS} =4.5V, I _D =6A	---	23	28	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	564	---	pF
C _{oss}	Output Capacitance		---	75	---	
C _{rss}	Reverse Transfer Capacitance		---	66	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =30V, I _D =1.5A, R _{GEN} =1 Ω , V _{GS} =10V	---	9	---	ns
t _r	Rise Time		---	10	---	ns
t _{d(off)}	Turn-Off Delay Time		---	15	---	ns
t _f	Fall Time		---	5	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =30V, I _D =12 A	---	14.2	---	nC
Q _{gs}	Gate-Source Charge		---	1.5	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	3.6	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Drain Diode Forward Voltage	V _{GS} =0V, I _S =8A, T _J =25 °C	---	---	1.2	V
I _S	Continuous Source Current	V _D =V _G =0V	---	---	12	A
I _{SM}	Pulsed Drain to Source Diode	V _D =V _G =0V	---	---	40	A

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J=25^{\circ}\text{C}$, $V_{DD}=15V$, $V_G=10V$, $R_G=25\Omega$, $L=0.5mH$.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

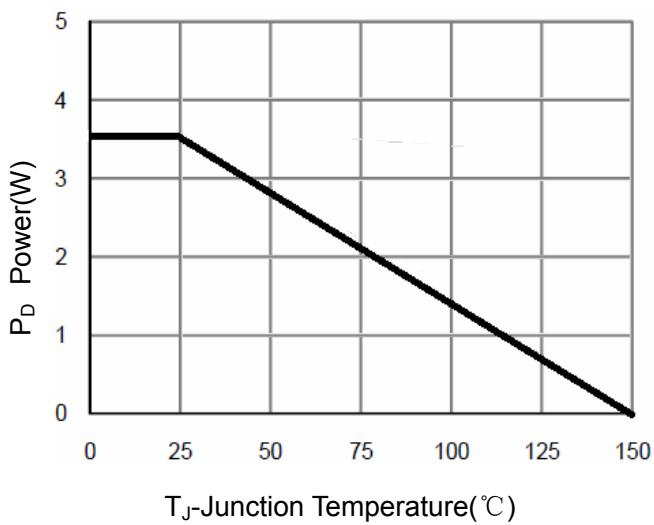


Figure 1 Power Dissipation

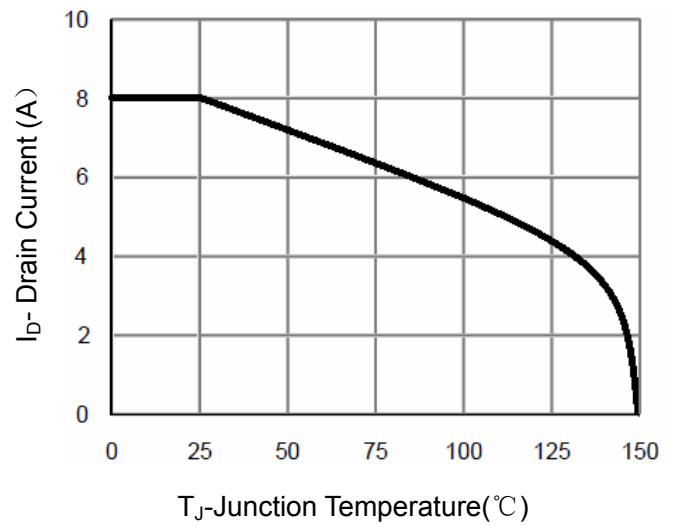


Figure 2 Drain Current

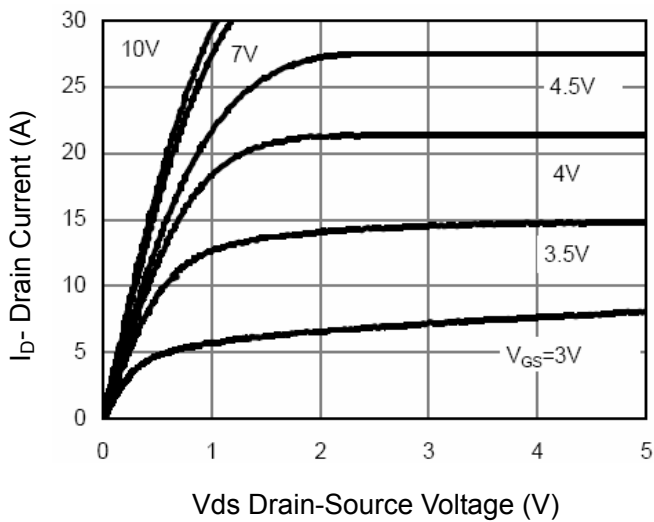


Figure 3 Output Characteristics

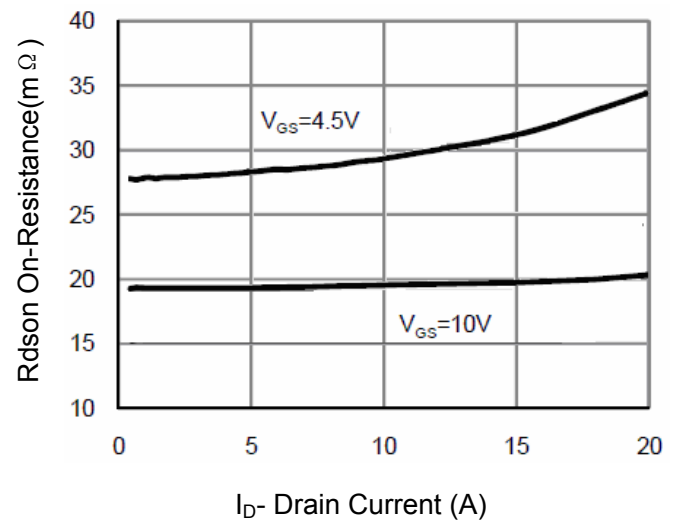


Figure 4 Drain-Source On-Resistance

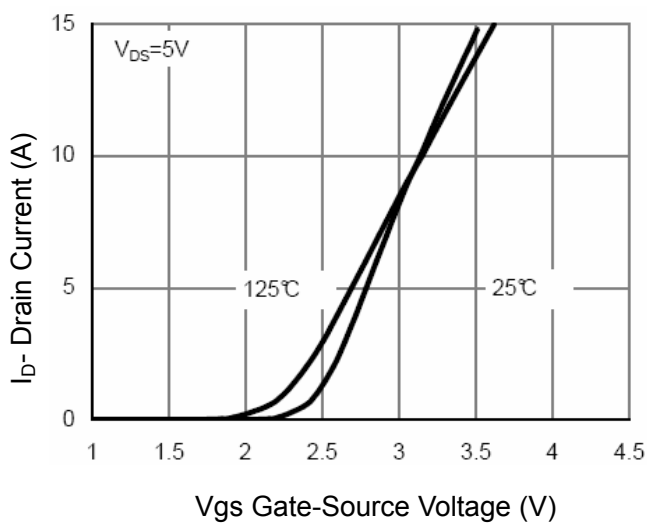


Figure 5 Transfer Characteristics

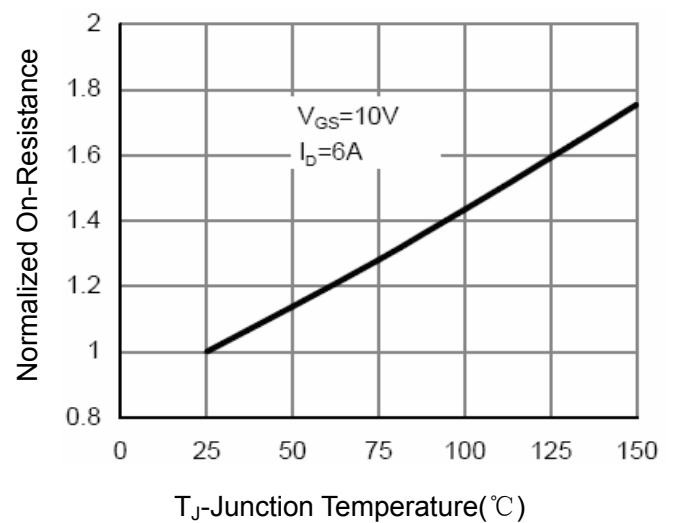
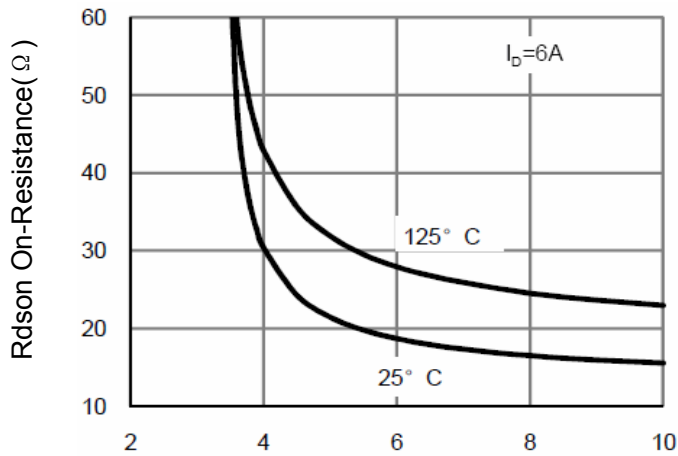
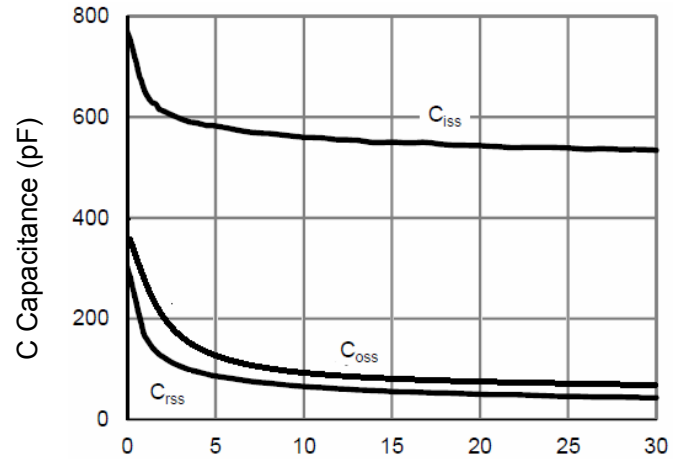


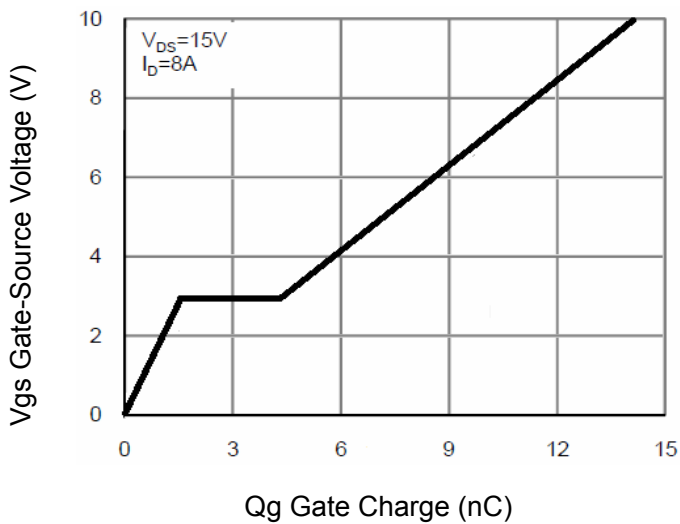
Figure 6 Drain-Source On-Resistance



Vgs Gate-Source Voltage (V)
Figure 7 Rdson vs Vgs



Vds Drain-Source Voltage (V)
Figure 8 Capacitance vs Vds



Qg Gate Charge (nC)
Figure 9 Gate Charge

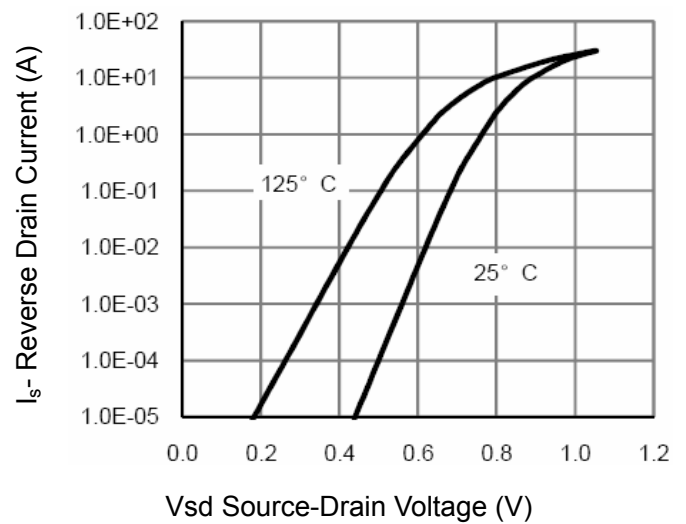


Figure 10 Source- Drain Diode Forward

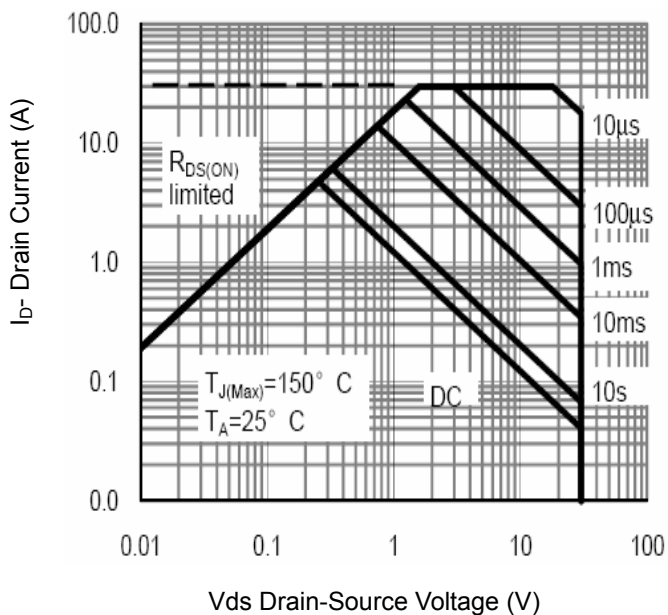


Figure 11 Safe Operation Area

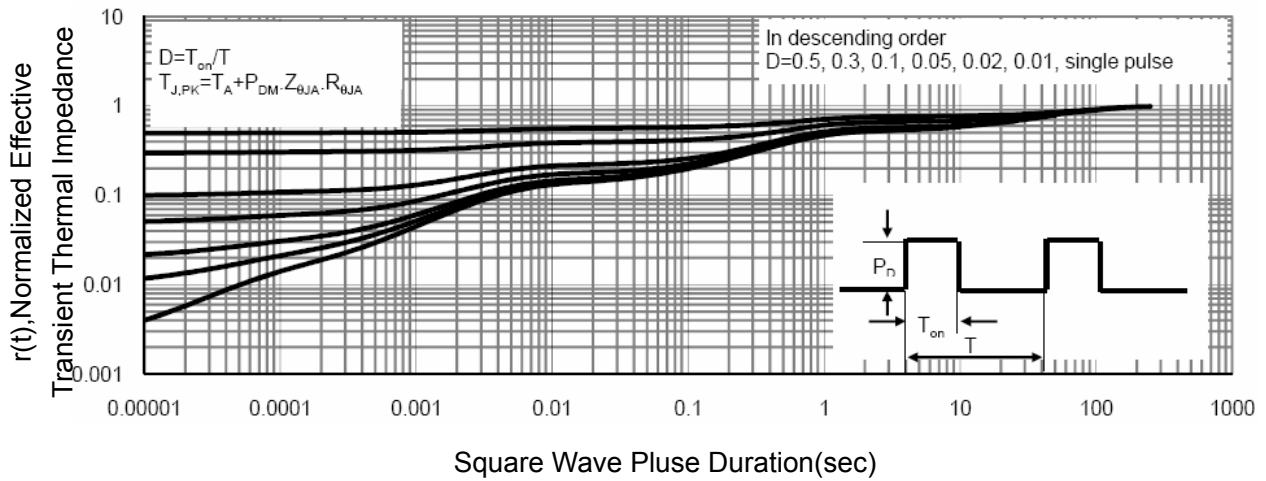


Figure 12 Normalized Maximum Transient Thermal Impedance

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourtce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	-30	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-30V, T _J =25 °C	---	---	-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	-1.0	-1.6	-2.5	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =-10V, I _D =-8A	---	28	33	m Ω
		V _{GS} =-4.5V, I _D =-5A	---	40	50	
G _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-18A	---	18	---	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	660	---	pF
C _{Oss}	Output Capacitance		---	100	---	
C _{rss}	Reverse Transfer Capacitance		---	65	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =-15V, I _D =-4A, R _{GEN} =3 Ω , V _{GS} =-10V	---	7.5	---	ns
t _r	Rise Time		---	5.6	---	ns
t _{d(off)}	Turn-Off Delay Time		---	19	---	ns
t _f	Fall Time		---	6	---	ns
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-15V, I _D =-6.5A	---	9.2	---	nC
Q _{gs}	Gate-Source Charge		---	1.6	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	2.2	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =-1A, T _J =25 °C	---	---	-1.2	V
I _S	Continuous Source Current	V _D =V _G =0V	---	---	12	A
I _{SM}	Pulsed Drain Current	V _D =V _G =0V	---	---	40	A

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J = 25^\circ\text{C}$, $V_{DD} = -15\text{V}$, $V_G = -10\text{V}$, $R_G = 25\Omega$, $L = 0.5\text{mH}$.
3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$

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

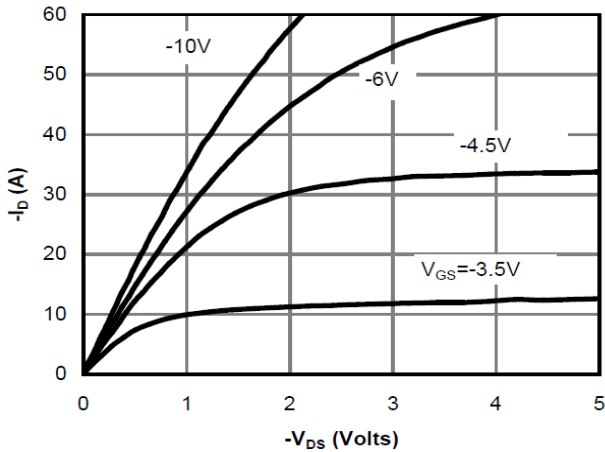


Figure 1: On-Region Characteristics

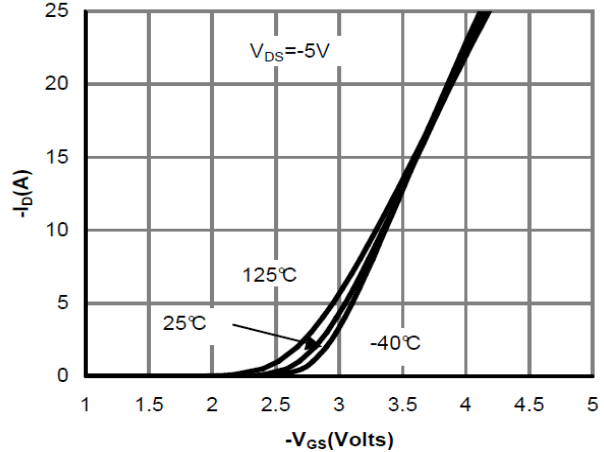


Figure 2: Transfer Characteristics

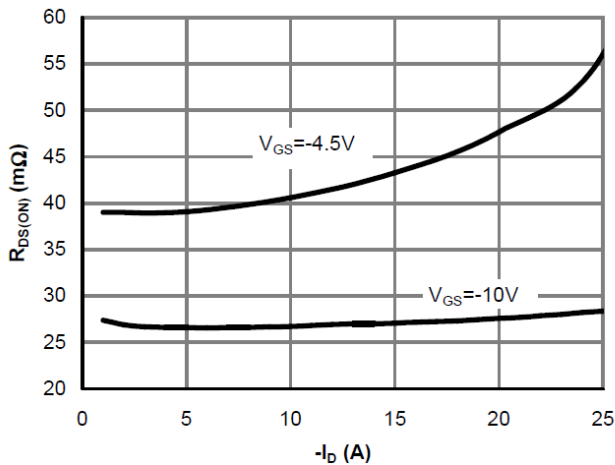


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

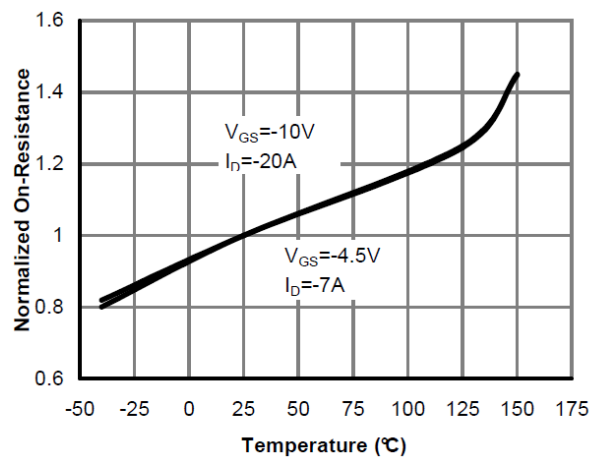


Figure 4: On-Resistance vs. Junction Temperature

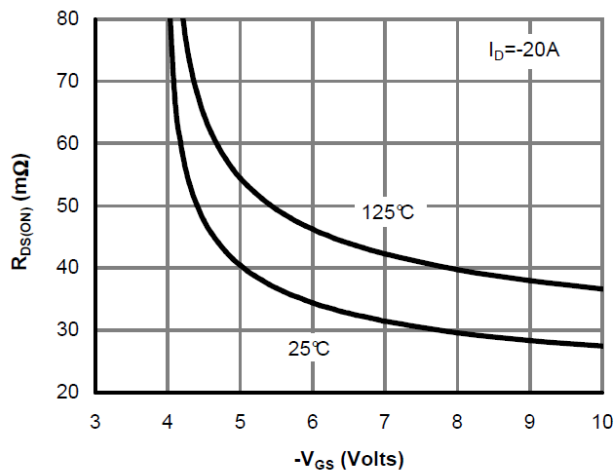


Figure 5: On-Resistance vs. Gate-Source Voltage

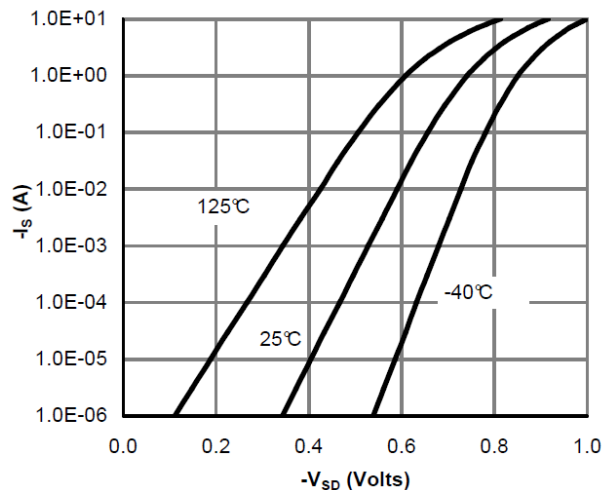


Figure 6: Body-Diode Characteristics

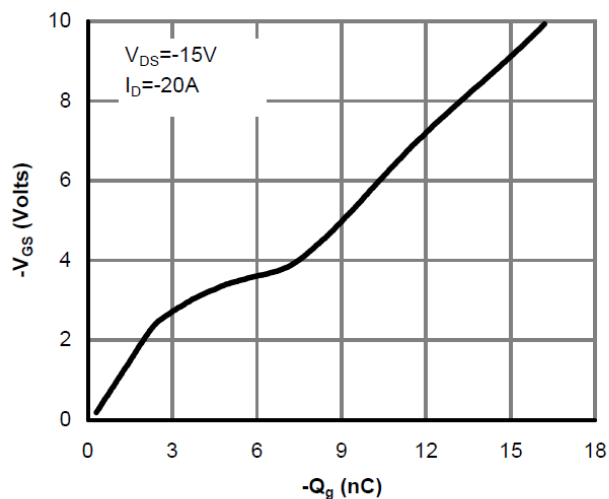


Figure 7: Gate-Charge Characteristics

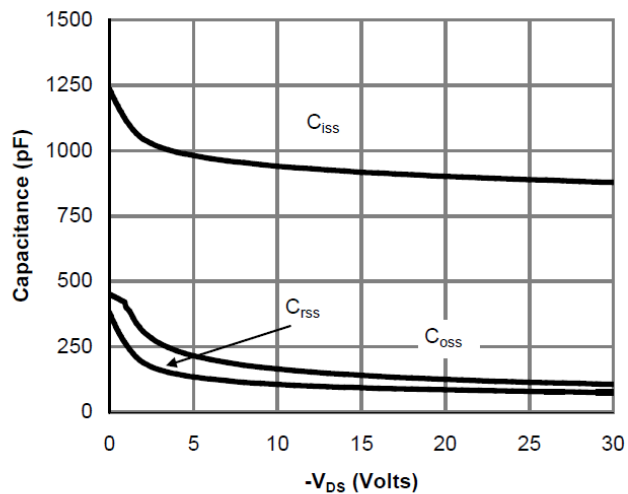


Figure 8: Capacitance Characteristics

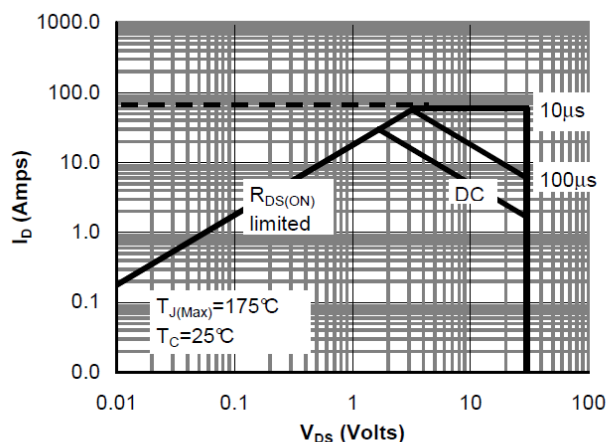


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

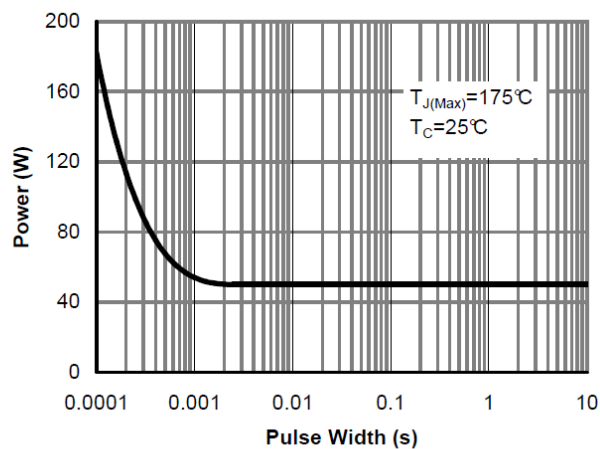


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

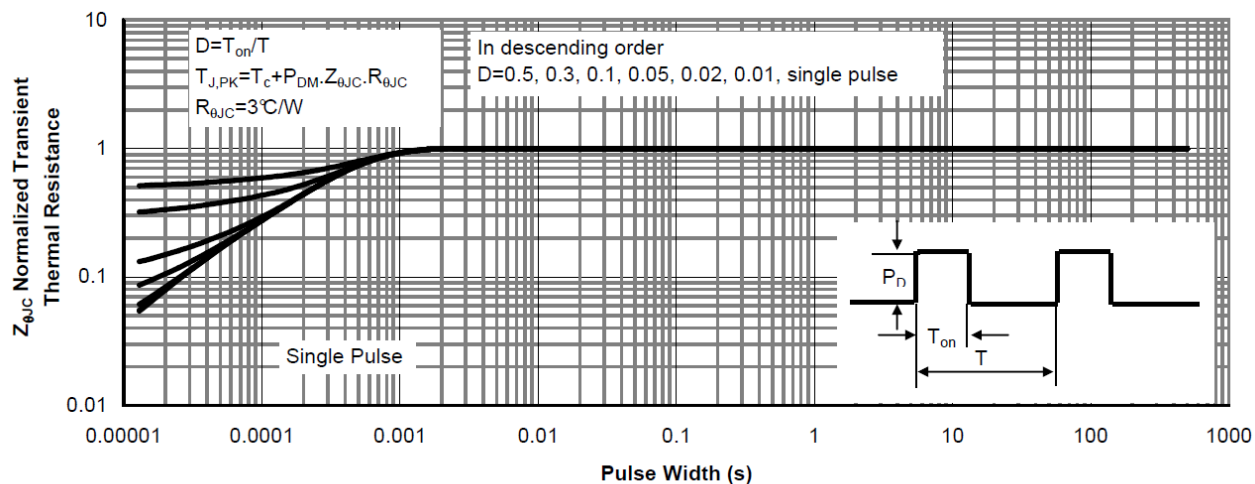
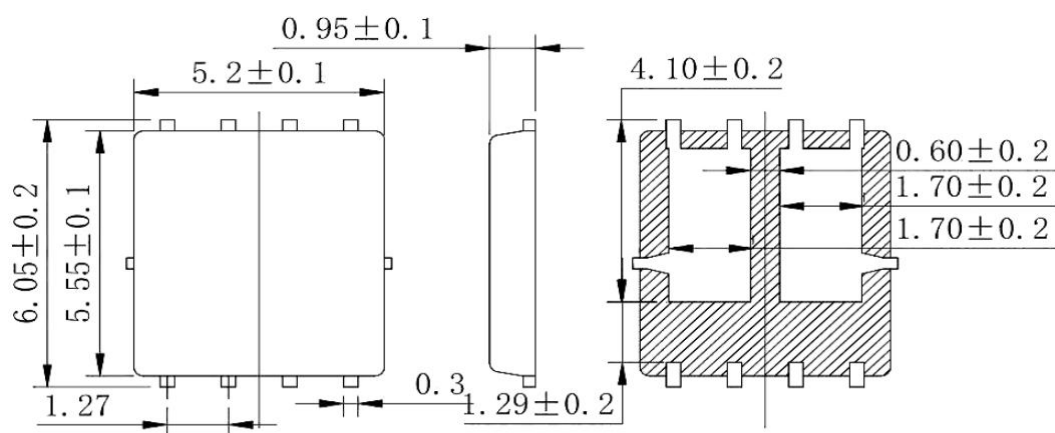
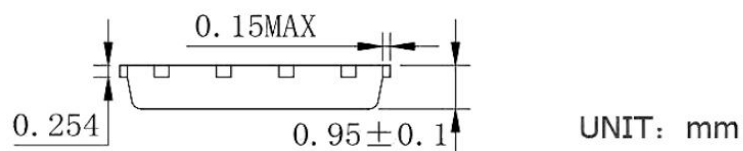


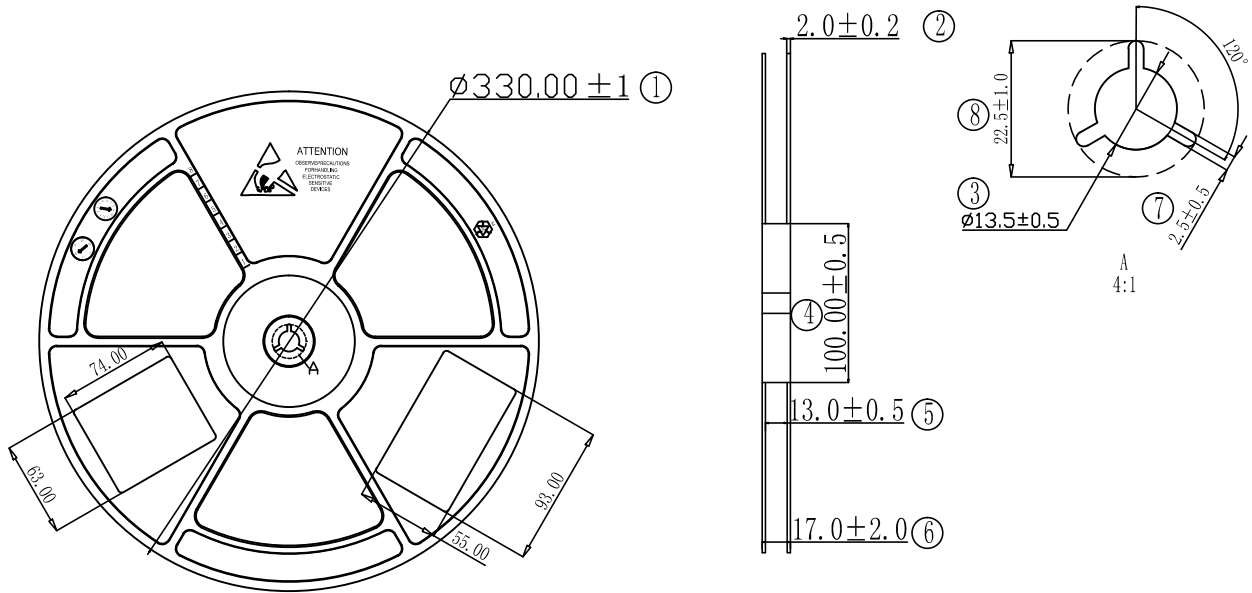
Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

DFN5×6-8D Package Information:

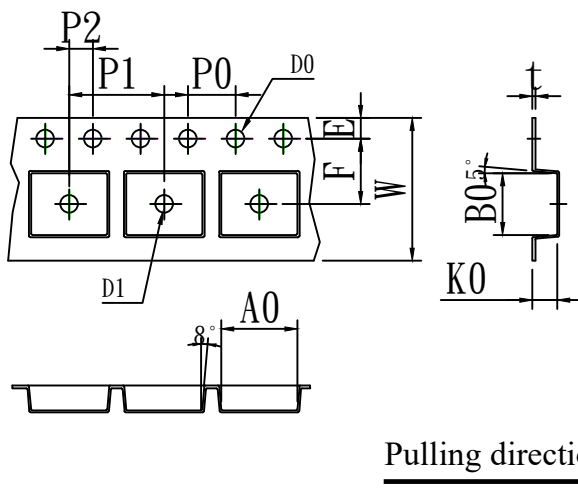


Tape & Reel Information

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

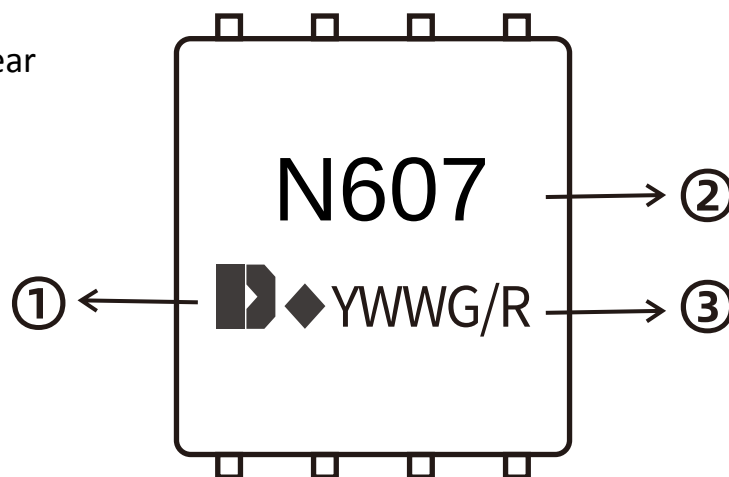
②. Part NO.

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	2023-07-16	Release of final version

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