

Description:

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

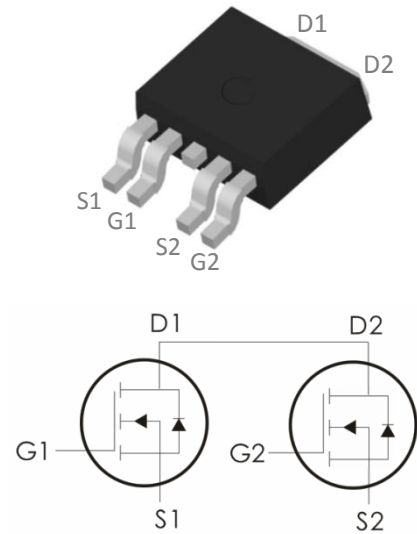
It can be used in a wide variety of applications.

Features:

N-Channel: $V_{DS}=30V, I_D=18A, R_{DS(on)} < 25m\Omega @ V_{GS}=10V$ (Typ: $18 m\Omega$)

P-Channel: $V_{DS}=-30V, I_D=-19A, R_{DS(on)} < 33m\Omega @ V_{GS}=-10V$ (Typ: $28 m\Omega$)

- 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
DOD607H	D607H	TO-252-4D	2500 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	30	-30	V
V_{GS}	Gate-Source Voltage	± 20	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ C$	18	-19	A
	Continuous Drain Current- $T_C=100^\circ C$	12	-13	
I_{DM}	Pulsed Drain Current ¹	72	-76	A
E_{AS}	Single pulse avalanche energy ²	20	36	
P_D	Power Dissipation - $T_C=25^\circ C$	20	30	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 Cast	6.25	4.2	$^\circ C/W$

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-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=30V$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	1	1.65	2.5	V
$R_{DS(on)}$	Drain-Source On Resistance ³	$V_{GS}=10V, I_D=5A$	---	18	25	m Ω
		$V_{GS}=4.5V, I_D=3A$	---	28	40	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	490	---	pF
C_{oss}	Output Capacitance		---	78.7	---	
C_{rss}	Reverse Transfer Capacitance		---	60.9	---	
Q_g	Gate Charge	$V_{GS}=4.5V, V_{DS}=15V$ $I_D=5.8A$	---	7.2	---	nC
Q_{gs}	Gate-Source Charge		---	0.84	---	
Q_{gd}	Gate-Drain Charge		---	1.26	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=15V, I_D=3A,$ $R_{REN}=3\ \Omega, V_{GS}=10V$	---	4.51	---	ns
t_r	Rise Time		---	2.41	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	14.7	---	ns
t_f	Fall Time		---	3.15	---	ns
Drain-Source Diode Characteristics						
I_S	Continuous Drain to Source Diode	$V_D=V_G=0V$	---	---	18	A
I_{SM}	Pulsed Drain to Source Diode	$V_D=V_G=0V$	---	---	72	A
V_{SD}	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=12A$	---	---	1.2	V

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : $T_J=25^{\circ}\text{C}$, $V_{DD}=15\text{V}$, $V_G=10\text{V}$, $L=0.5\text{mH}$
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)

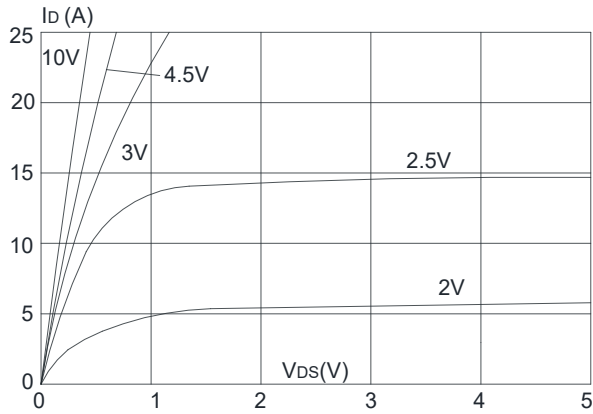


Figure1: Output Characteristics

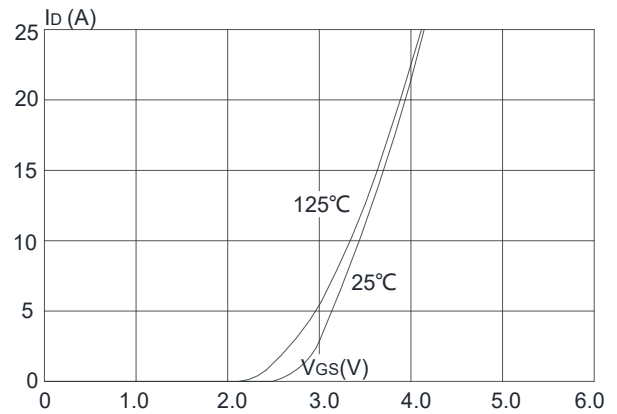


Figure 2: Typical Transfer Characteristics

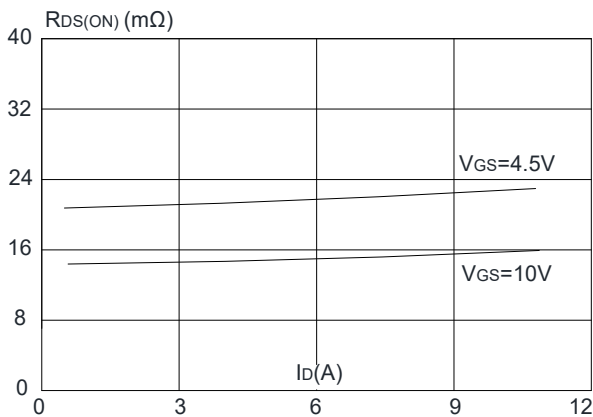


Figure 3: On-resistance vs. Drain Current

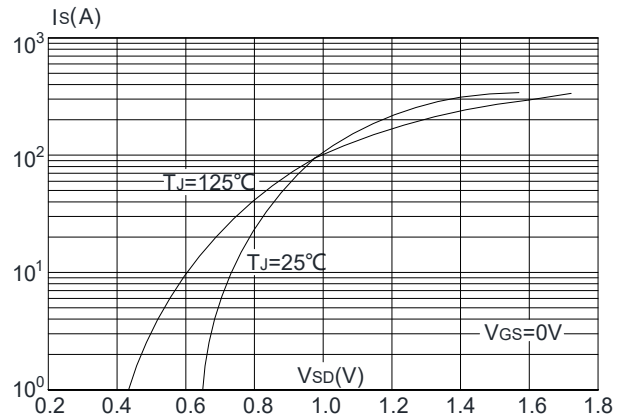


Figure 4: Body Diode Characteristics

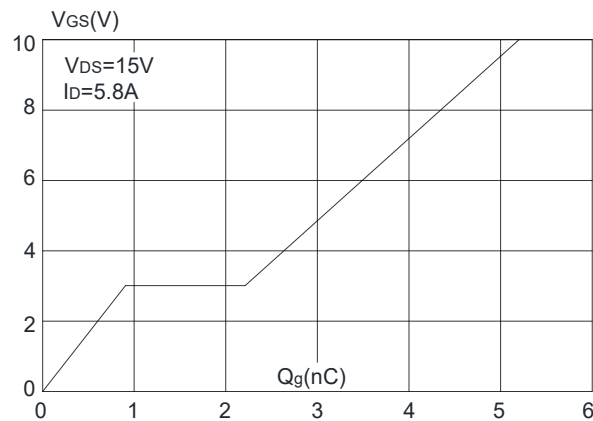


Figure 5: Gate Charge Characteristics

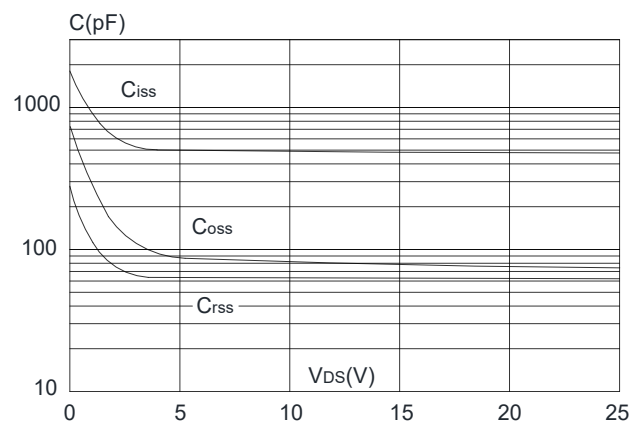


Figure 6: Capacitance Characteristics

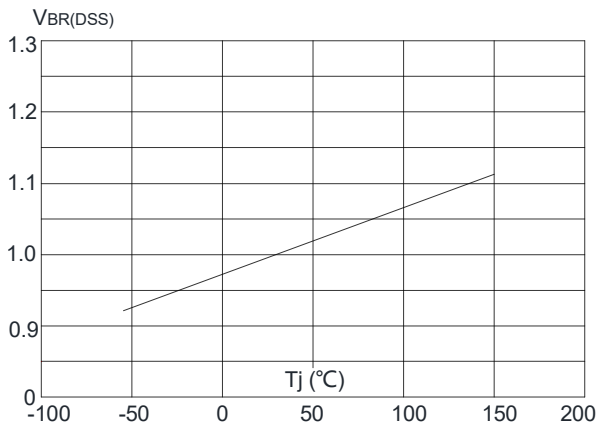


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

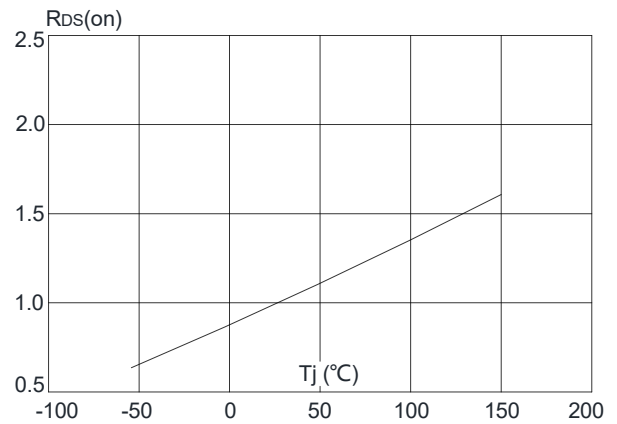


Figure 8: Normalized on Resistance vs. Junction Temperature

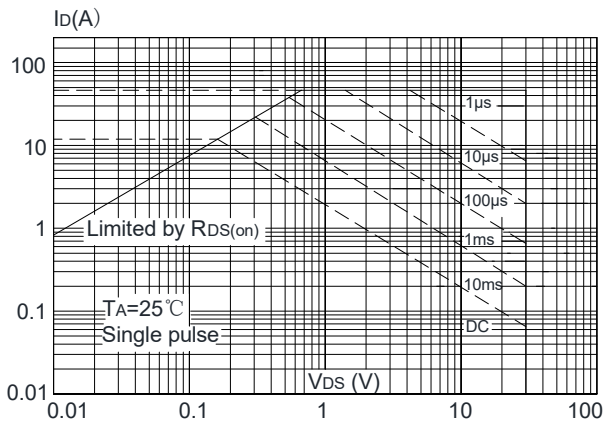


Figure 9: Maximum Safe Operating Area

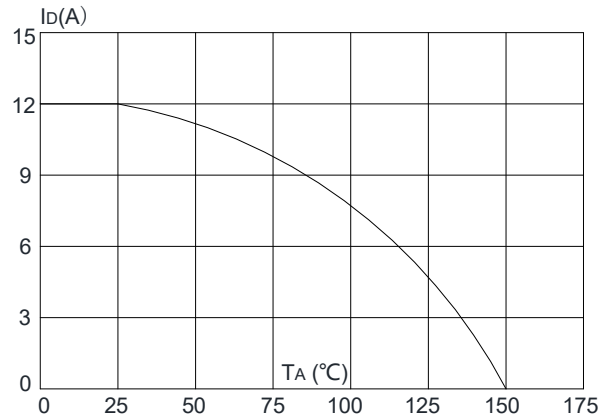


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

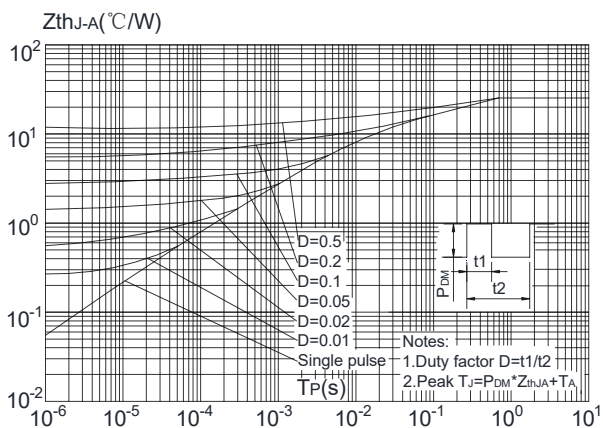


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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	$V_{GS}=0V, I_D=250\ \mu\text{A}$	-30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=-30V$	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	-1	-1.6	-3	V
$R_{DS(on)}$	Drain-Source On Resistance ³	$V_{GS}=-10V, I_D=-8A$	---	28	33	m Ω
		$V_{GS}=-4.5V, I_D=-5A$	---	36	50	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	---	520	---	pF
C_{oss}	Output Capacitance		---	105	---	
C_{rss}	Reverse Transfer Capacitance		---	68.25	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=-15V, I_D=-4A$ $V_{GS}=-10V, R_{GEN}=3\ \Omega$	---	7.87	---	ns
t_r	Rise Time		---	5.88	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	19.95	---	ns
t_f	Fall Time		---	6.3	---	ns
Q_g	Total Gate Charge	$V_{GS}=-10V, V_{DS}=-15V,$ $I_D=-6.5A$	---	9.2	---	nC
Q_{gs}	Gate-Source Charge		---	1.68	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	2.3	---	nC
Drain-Source Diode Characteristics						
I_S	Continuous Drain to Source Diode	$V_D=V_G=0V$	---	---	-19	A
I_{SM}	Pulsed Drain to Source Diode		---	---	-76	---
V_{SD}	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=-1A$	---	---	-1.2	V

Notes:

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

P-Typical Characteristics: (T_c=25°C unless otherwise noted)

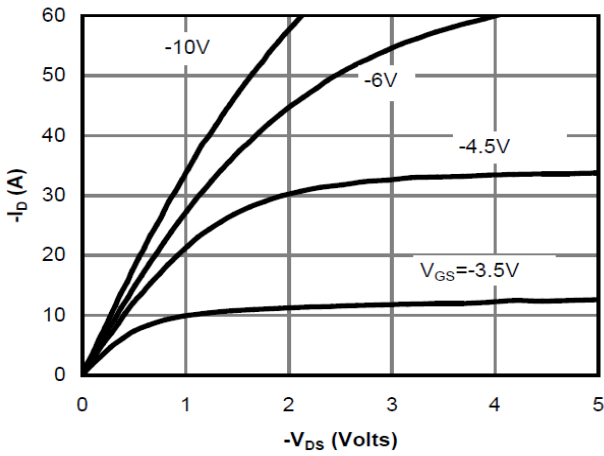


Figure 1: On-Region Characteristics

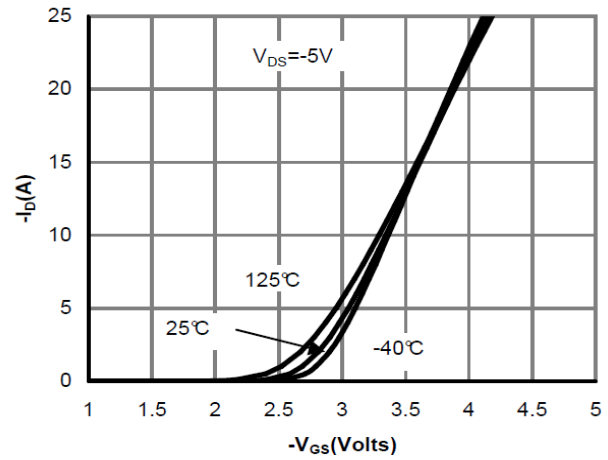


Figure 2: Transfer Characteristics

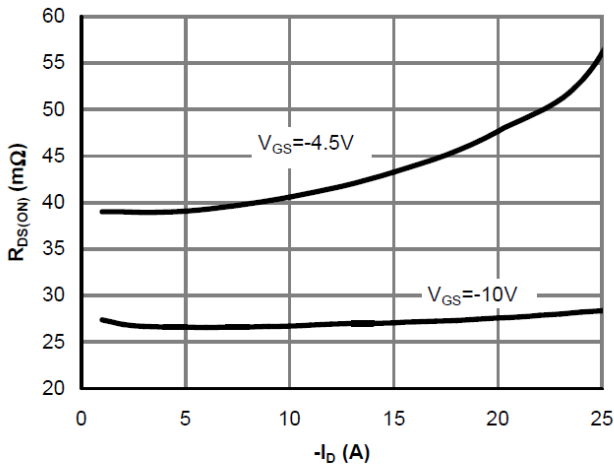


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

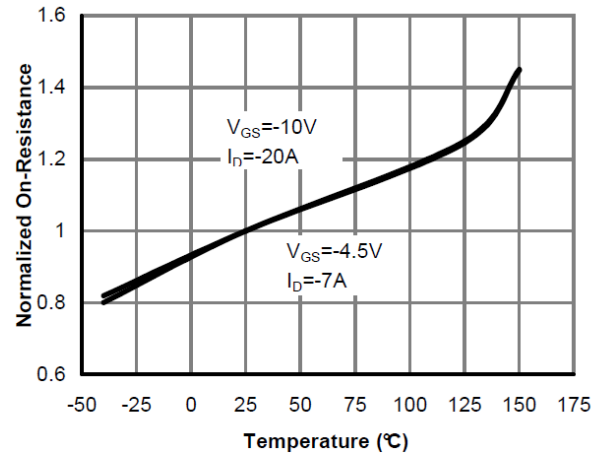


Figure 4: On-Resistance vs. Junction Temperature

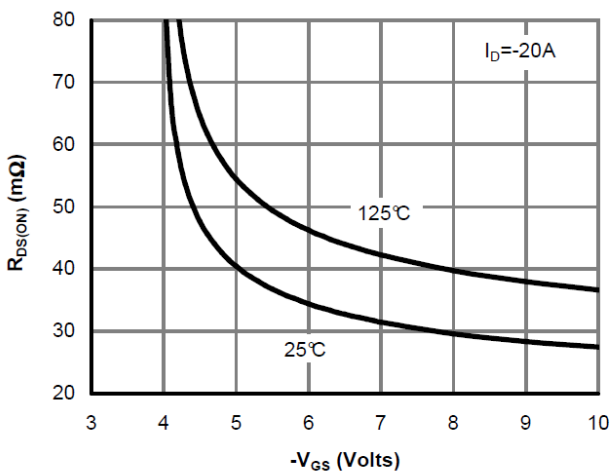


Figure 5: On-Resistance vs. Gate-Source Voltage

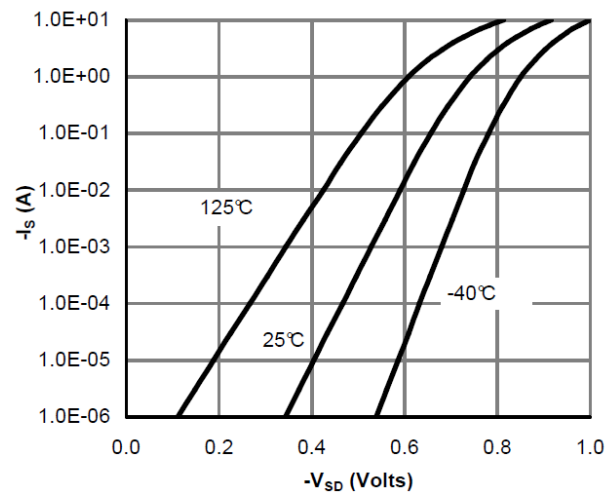


Figure 6: Body-Diode Characteristics

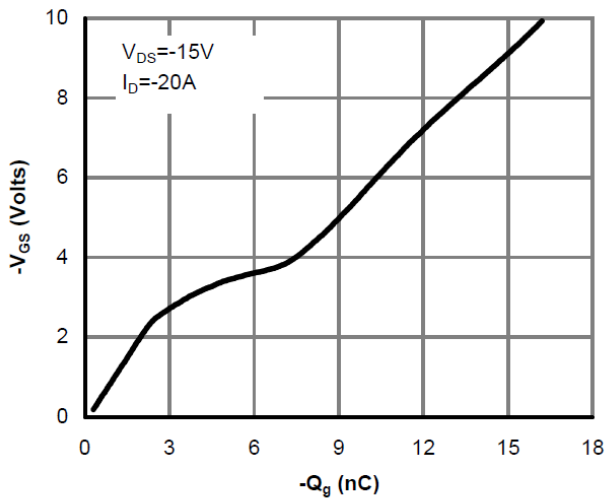


Figure 7: Gate-Charge Characteristics

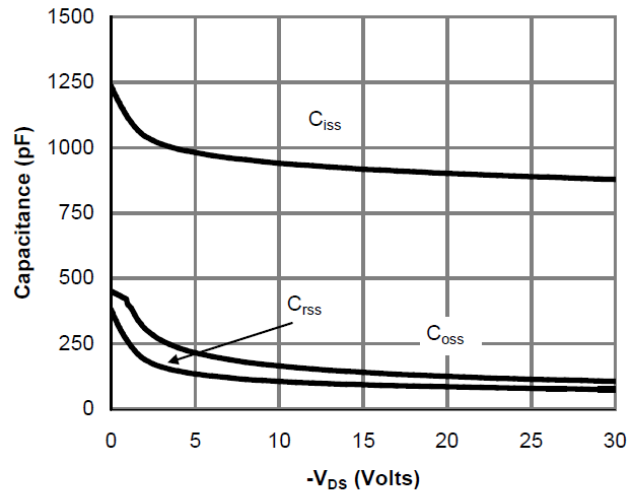


Figure 8: Capacitance Characteristics

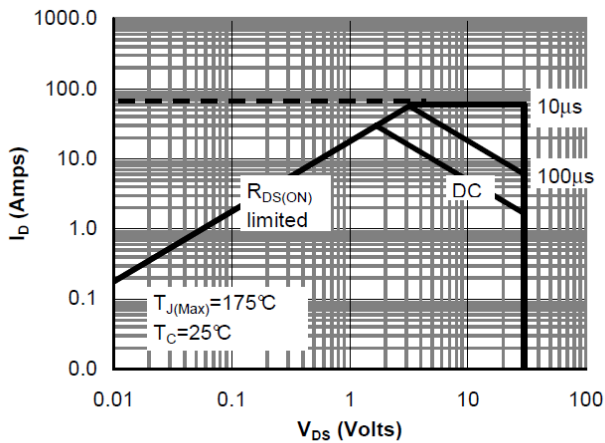


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

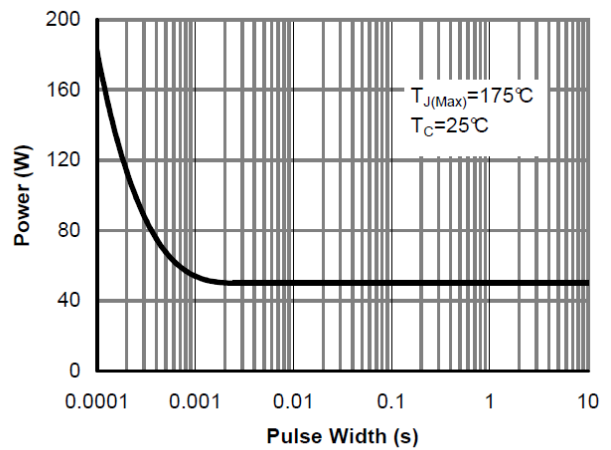


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

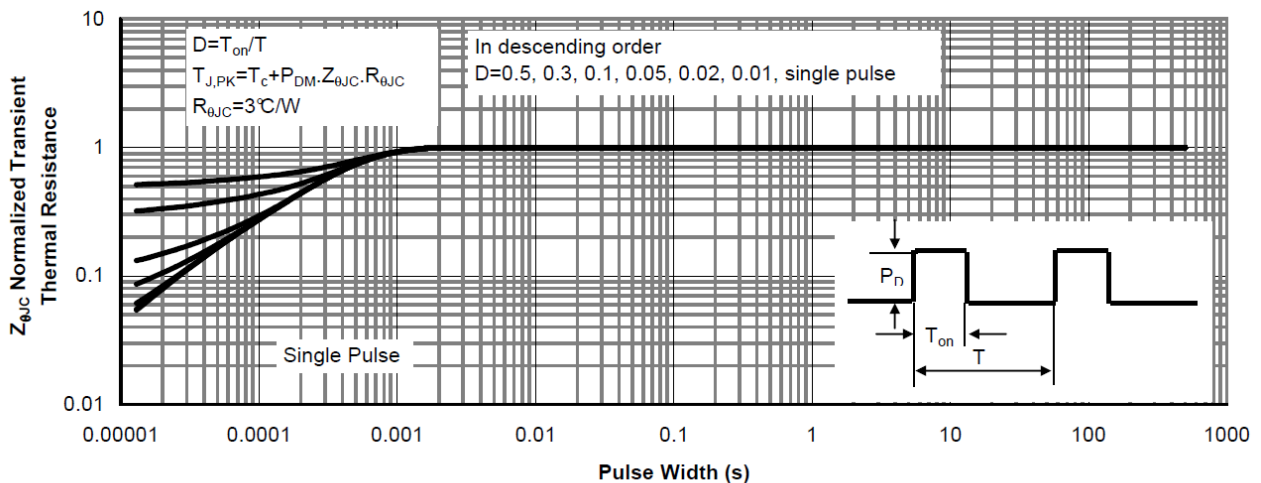
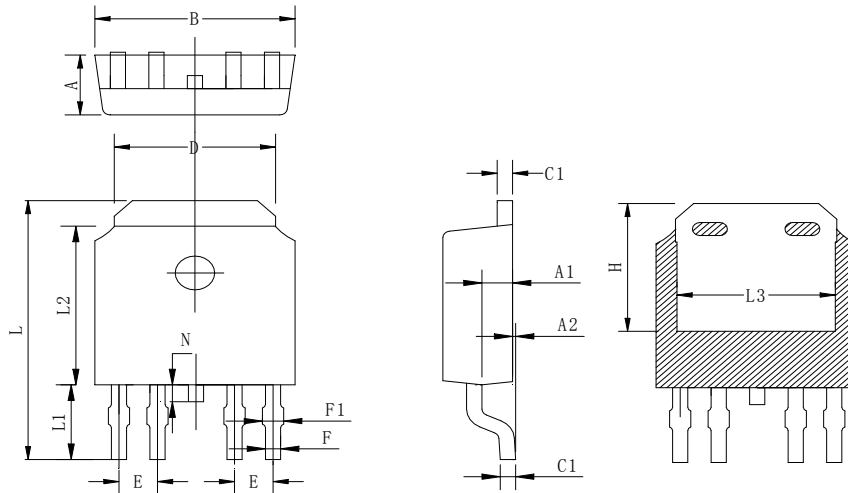


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

TO-252-4D Package Outline Data

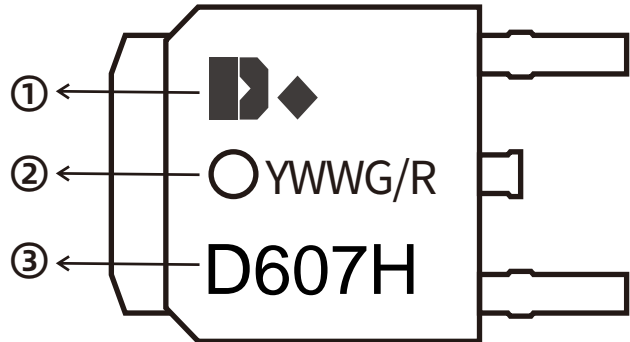
UNIT: mm



Symbol	Min	Typ	Max
A	2.20	2.30	2.40
A1	0.91	1.01	1.11
A2	0.05	0.15	0.25
B	6.45	6.60	6.75
C	0.45	0.50	0.58
C1	0.45	0.50	0.58
D	5.12	5.32	5.52
E	1.27 TYP		
F1	0.45	0.60	0.75
F	0.40	0.50	0.60
H	4.70	4.90	5.10
L	9.70	10.00	10.20
L1	2.6	2.8	3.0
L2	5.95	6.10	6.25
L3	5.00	5.20	5.40`
N	0.45	0.65	0.85

Marking Information:

- ①. Doingter LOGO
- ②. Date Code(YWWG / R)
 Y : Year Code , last digit of the year
 WW : Week Code(01-53)
 G/R : G(Green) /R(Lead Free)
- ③. Part NO.



Previous Version

Version	Date	Subjects (major changes since last revision)
1.0	2024-06-16	Release of final version

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