

Description:

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

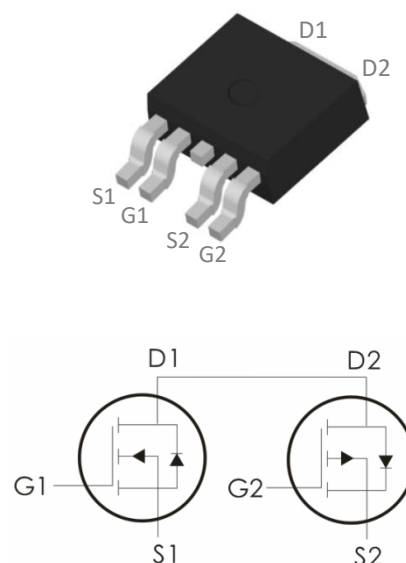
It can be used in a wide variety of applications.

Features:

N-Channel: $V_{DS}=40V, I_D=25A, R_{DS(on)} < 20m\Omega @ V_{GS}=10V$ (Typ: $17m\Omega$)

P-Channel: $V_{DS}=-40V, I_D=-25A, R_{DS(on)} < 26m\Omega @ V_{GS}=-10V$ (Typ: $24m\Omega$)

- 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
DOD619B	D619B	TO- 252-4	2500 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	40	-40	V
V_{GS}	Gate-Source Voltage	± 20	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ\text{C}^1$	25	-25	A
	Continuous Drain Current- $T_C=100^\circ\text{C}^1$	17.5	-17.5	
I_{DM}	Pulsed Drain Current ²	100	-100	A
E_{AS}	Single pulse avalanche energy ³	130	156	mJ
P_D	Power Dissipation - $T_C=25^\circ\text{C}$	40	40	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150		$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	N-CH	P-CH	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Cast	3.12	3.12	$^\circ\text{C}/\text{W}$

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-Sourtce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	40	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =40V	---	---	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	---	17	20	m Ω
		V _{GS} =4.5V, I _D =5A	---	21	26	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, f=1MHz	---	1000	---	pF
C _{oss}	Output Capacitance		---	96	--	
C _{rss}	Reverse Transfer Capacitance ⁶³		---	67.5	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =20V, I _D =5A, R _{ENG} =3 Ω ,V _{GS} =10V	---	10	---	ns
t _r	Rise T8e		---	12	---	ns
t _{d(off)}	Turn-Off Delay T39e		---	35	---	ns
t _f	Fall T16ime		---	8	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =20V, I _D =5A	---	11	---	nC
Q _{gs}	Gate-Source Charge		---	1.8	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	2.2	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	3 _{GS} =0V, I _{SD} =8A	---	---	1.2	V
I _S	Continuous Drain Curren	V _D =V _G =0V	---	---	25	A
I _{SM}	Pulsed Drain Current		---	---	100	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 : $T_J=25^{\circ}C$, $V_{DD}=20V$, $V_G=10V$, $L=0.5mH$
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)

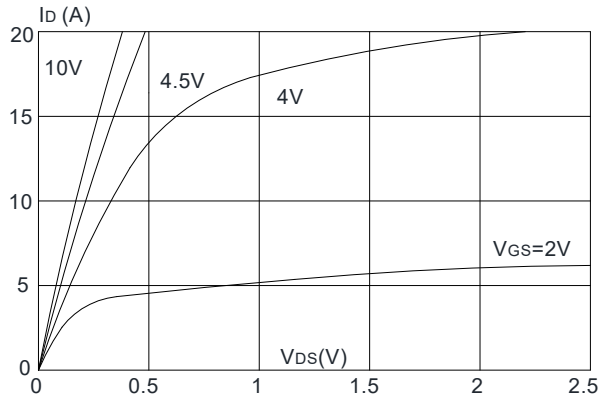


Figure 1: Output Characteristics

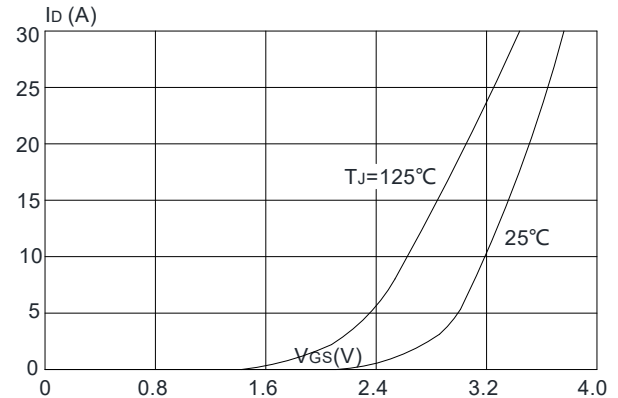


Figure 2: Typical Transfer Characteristics

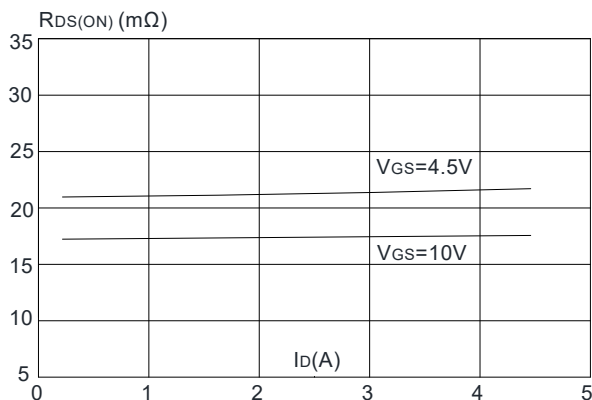


Figure 3: On-resistance vs. Drain Current

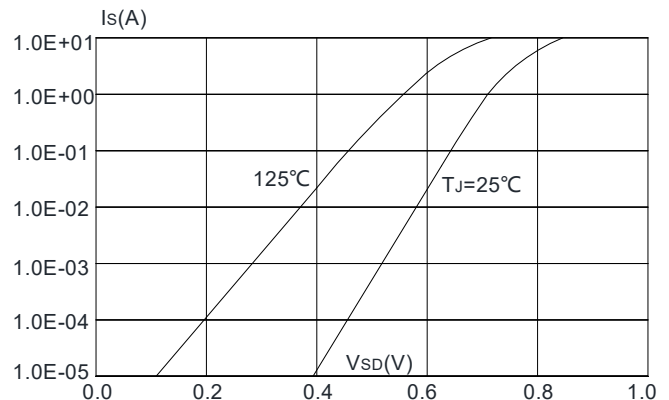


Figure 4: Body Diode Characteristics

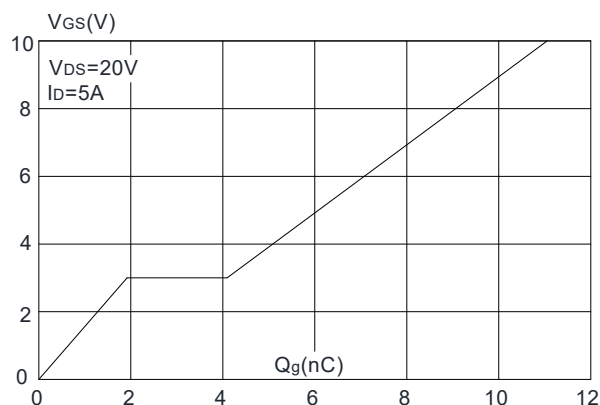


Figure 5: Gate Charge Characteristics

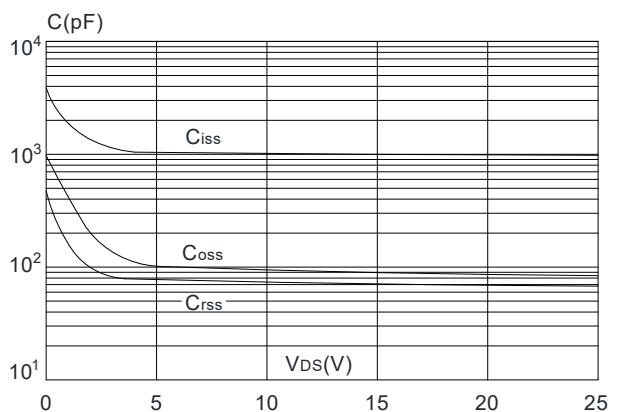


Figure 6: Capacitance Characteristics

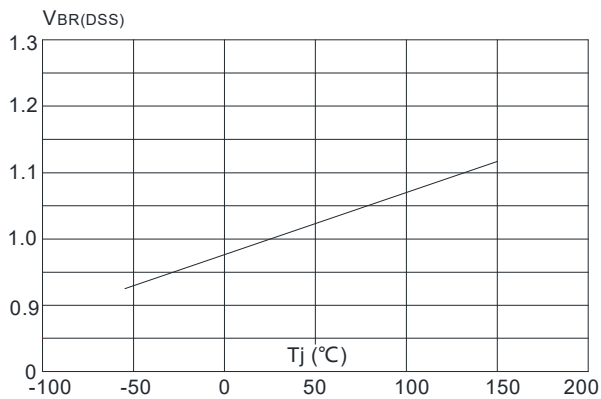


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

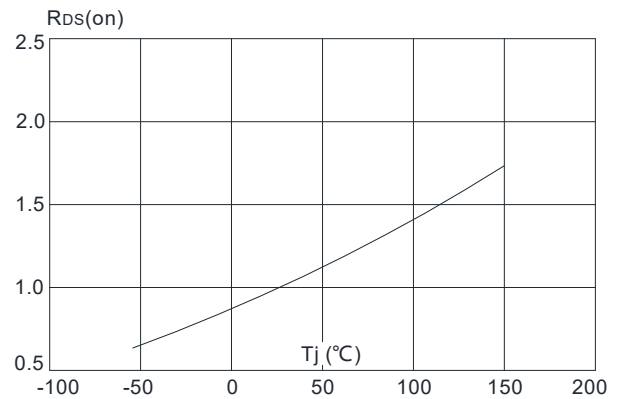


Figure 8: Normalized on Resistance vs. Junction Temperature

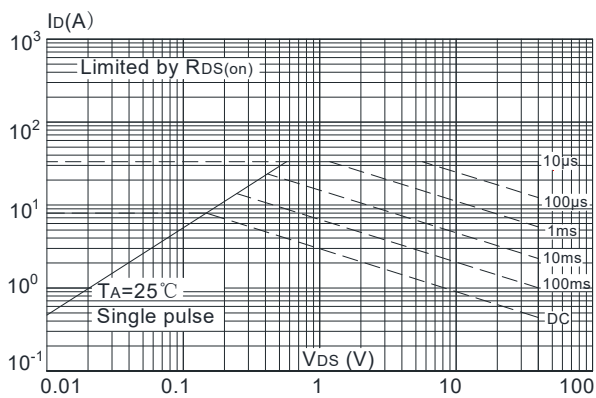


Figure 9: Maximum Safe Operating Area

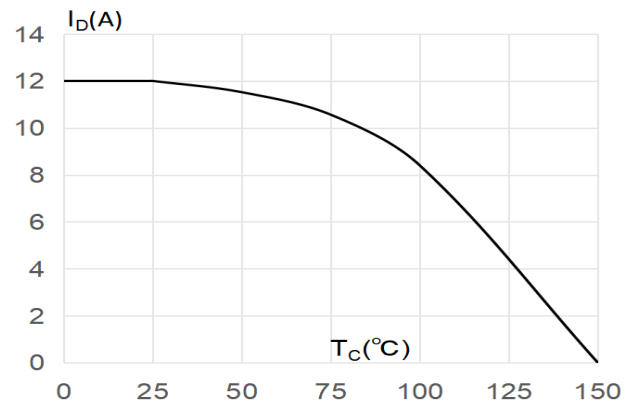


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

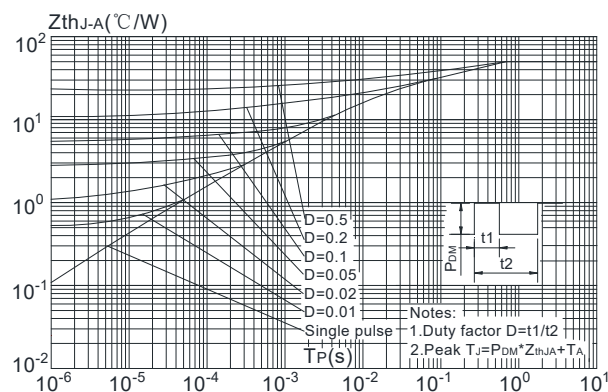


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

P-Channel Electrical Characteristics: ($T_A=25^{\circ}\text{C}$ 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	-40	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-40V	---	---	-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	---	24	26	m Ω
		V _{GS} =-4.5V, I _D =-5A	---	29	35	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-20V, V _{GS} =0V, f=1MHz	---	1300	---	pF
C _{oss}	Output Capacitance		---	102.9	---	
C _{rss}	Reverse Transfer Capacitance		---	76.5	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} = -20V, I _D =-1A	---	9.1	---	ns
t _r	Rise Time		---	7.35	---	ns
t _{d(off)}	Turn-Off Delay Time		V _{GS} = -10V, R _{GEN} =6 Ω	---	32.5	---
t _f	Fall Time		---	17.8	---	ns
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-20V, I _D =-5.5A	---	20	---	nC
Q _{gs}	Gate-Source Charge		---	2.5	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	3.7	---	nC
Drain-Source Diode Characteristics						
I _S	Continuous Drain to Source Diode	V _D =V _G =0V	---	---	-25	A
I _{SM}	Pulsed Drain to Source Diode		---	---	-100	---
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 : $T_J=25^{\circ}C$, $V_{DD}=-20V$, $V_G=-10V$, $L=0.5mH$
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)

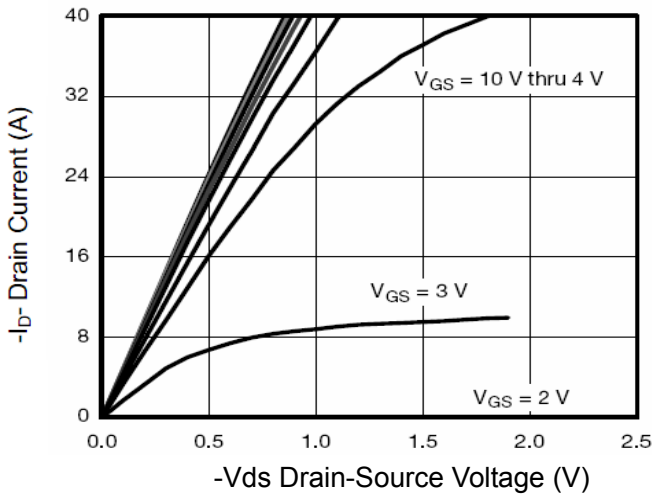


Figure 1 Output Characteristics

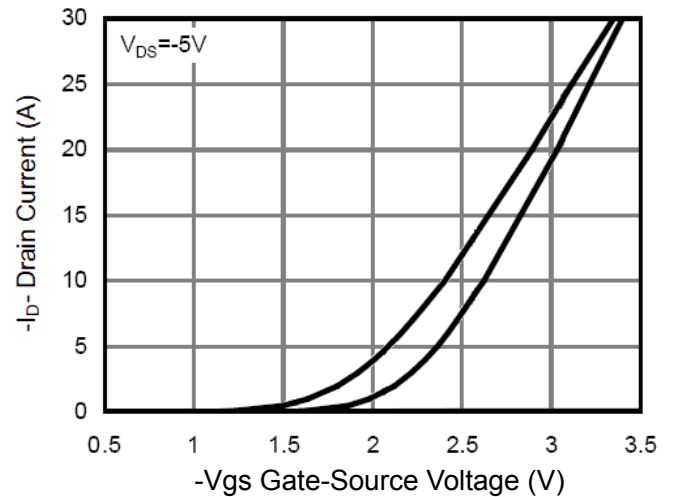


Figure 2 Transfer Characteristics

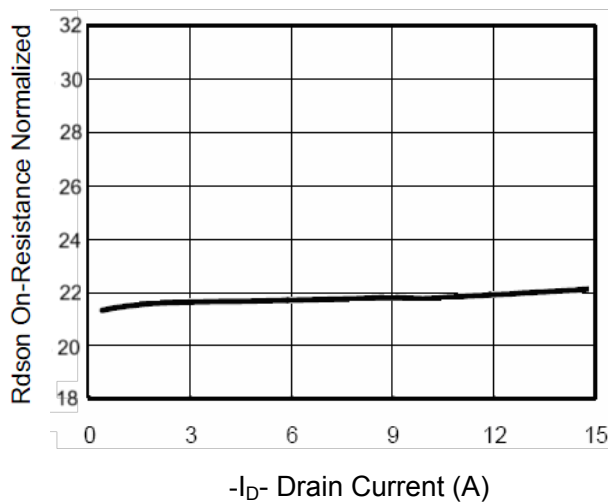


Figure 3 Rdson- Drain Current

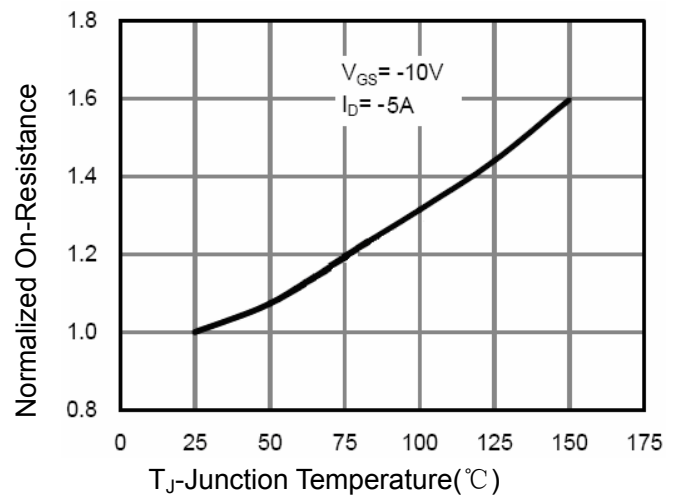


Figure 4 Rdson-Junction Temperature

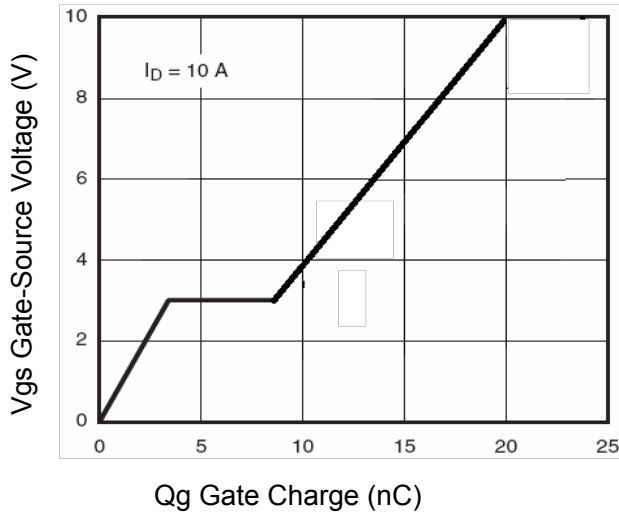


Figure 5 Gate Charge

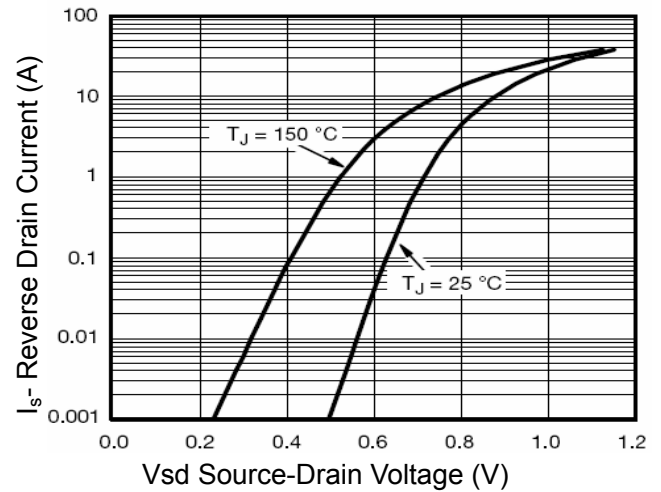


Figure 6 Source- Drain Diode Forward

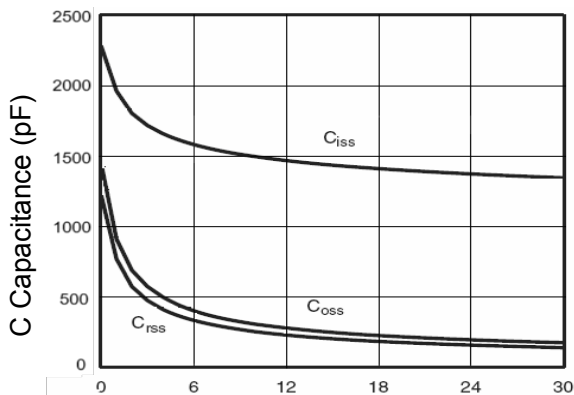


Figure 7 Capacitance vs Vds

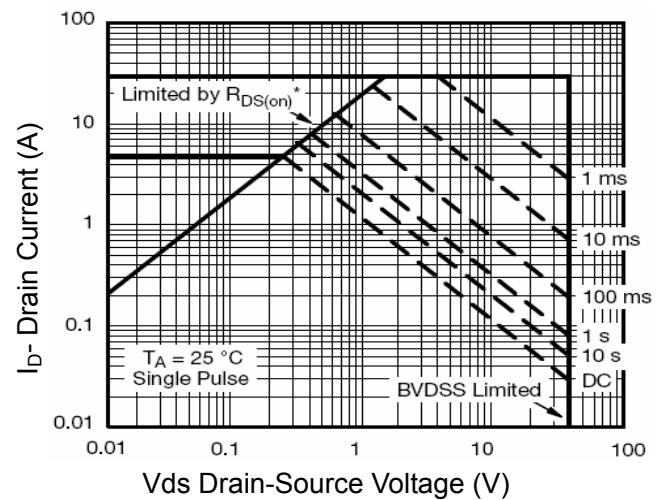


Figure 8 Safe Operation Area

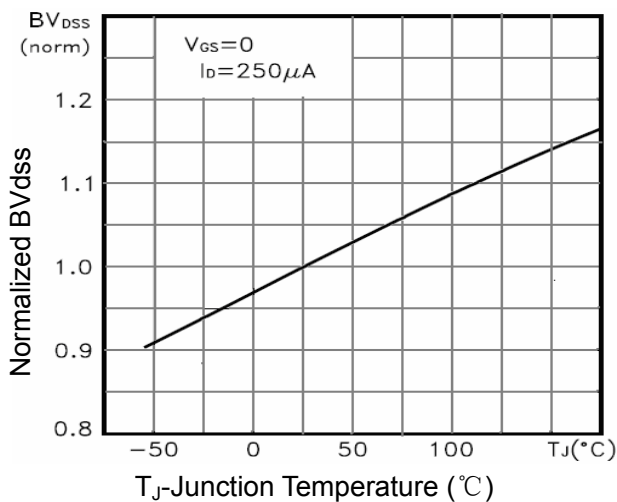


Figure 9 BV_{DSS} vs Junction Temperature

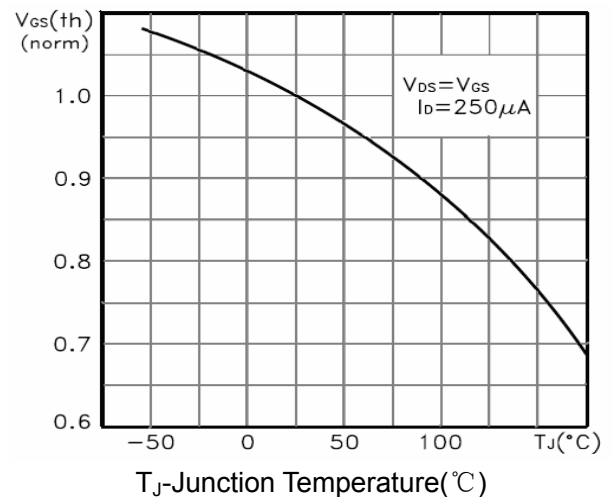


Figure 10 $V_{GS(th)}$ vs Junction Temperature

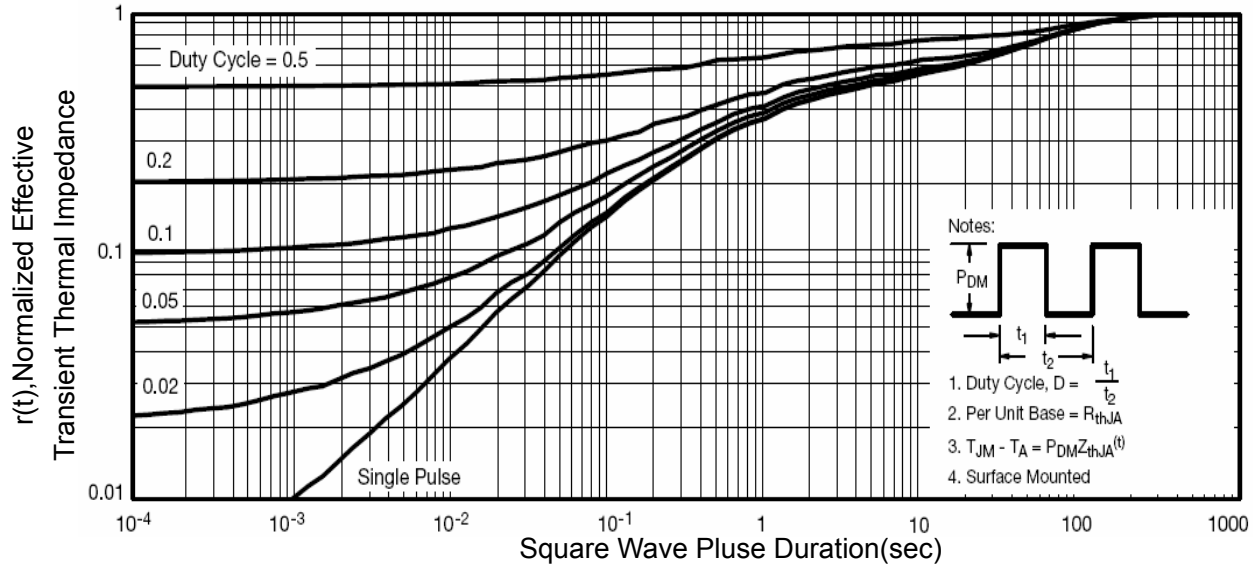
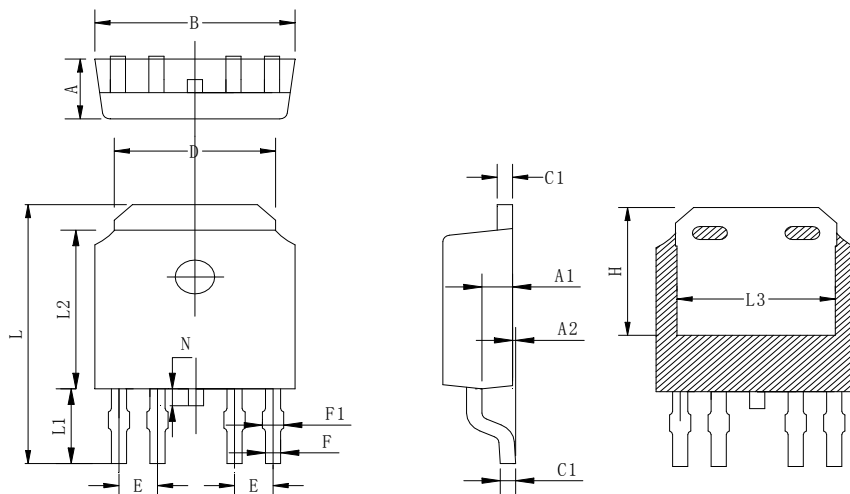


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-252-4 Package Outline Data

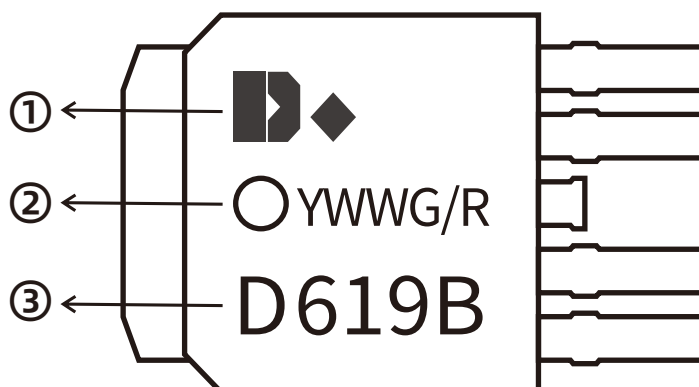
UNIT: mm



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)
1.1	2026-04-16	Release of final version

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