

Features

- Excellent $R_{DS(ON)}$
- Low gate charge
- Halogen free
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 standards for high reliability

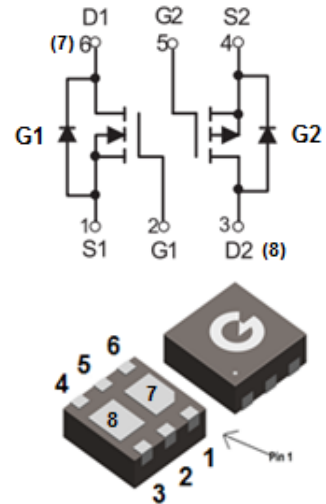
HF

Applications

- Load Switch
- PWM Application

Mechanical Data

- Case: DFN2020-6LC
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



DFN2020-6LC

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TGBLH2201DF2	DFN2020-6LC	3000 pcs / Tape & Reel	H2201

Maximum Ratings (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	G ₁	G ₂	Unit
Drain-to-Source Voltage	V_{DS}	20	-20	V
Gate-to-Source Voltage	V_{GS}	± 12	± 12	V
Continuous Drain Current ($T_A = 25^\circ\text{C}$)	I_D	3	-3	A
Continuous Drain Current ($T_A = 100^\circ\text{C}$)	I_D	2	-2	A
Pulsed Drain Current *1	I_{DM}	12	-12	A

Thermal Characteristics

Parameter	Symbol	G ₁	G ₂	Unit
Power Dissipation ($T_A = 25^\circ\text{C}$)	P_D	0.77	1	W
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	162	125	$^\circ\text{C/W}$
Operating Junction Temperature Range	T_J	-55 ~ +150		$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150		$^\circ\text{C}$

Electrical Characteristics-NMOS G_1 (@ $T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 20V, V _{GS} = 0V	-	-	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±12V, V _{DS} = 0V	-	-	±100	nA
On Characteristics						
R _{DS(ON)}	Static Drain-Source On-resistance *2	V _{GS} = 4.5V, I _D = 3A	-	-	55	mΩ
		V _{GS} = 2.5V, I _D = 2A	-	-	85	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	0.4	-	1.0	V
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 10V f = 1.0MHz	-	184	-	pF
C _{OSS}	Output Capacitance		-	38	-	
C _{RSS}	Reverse Transfer Capacitance		-	28	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time	V _{GS} = 4.5V V _{DD} = 10V R _G = 3Ω I _D = 3A	-	2.3	-	ns
t _r	Turn-on Rise Time		-	3.1	-	
t _{d(OFF)}	Turn-Off Delay Time		-	9.2	-	
t _f	Turn-Off Fall Time		-	2.5	-	
Q _G	Total Gate-Charge	V _{DD} = 10V V _{GS} = 4.5V I _D = 3A	-	2.7	-	nC
Q _{GS}	Gate to Source Charge		-	0.4	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	0.5	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _{SD} = 3A, V _{GS} = 0V	-	-	1.2	V

Notes:

- 1、 Repetitive rating; pulse width limited by maximum junction temperature
- 2、 The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 0.5\%$

Electrical Characteristics-PMOS G₂ (@ T_A = 25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = -250μA	-20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -20V, V _{GS} = 0V	-	-	-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±12V, V _{DS} = 0V	-	-	±100	nA
On Characteristics						
R _{DS(ON)}	Static Drain-Source On-resistance *2	V _{GS} = -4.5V, I _D = -3A	-	-	70	mΩ
		V _{GS} = -2.5V, I _D = -2A	-	-	100	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-0.5	-	-1.0	V
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = -10V f = 1.0MHz	-	503	-	pF
C _{OSS}	Output Capacitance		-	67	-	
C _{RSS}	Reverse Transfer Capacitance		-	58	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time	V _{GS} = -4.5V, V _{DD} = -10V R _G = 1Ω, R _L = 1.2Ω I _D = -3A	-	11	-	ns
t _r	Turn-on Rise Time		-	52	-	
t _{d(OFF)}	Turn-Off Delay Time		-	16	-	
t _f	Turn-Off Fall Time		-	10	-	
Q _G	Total Gate-Charge	V _{GS} = -4.5V	-	4.1	-	nC
Q _{GS}	Gate to Source Charge	V _{DD} = -10V	-	0.8	-	
Q _{GD}	Gate to Drain (Miller) Charge	I _D = -2A	-	1.1	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *2	I _{SD} = -4.1A, V _{GS} = 0V	-	-	-1.2	V
I _S	Diode Continuous Forward Current		-	-	-5.1	A

Ratings and Characteristics Curves-G₁ (@ T_A = 25°C unless otherwise specified)

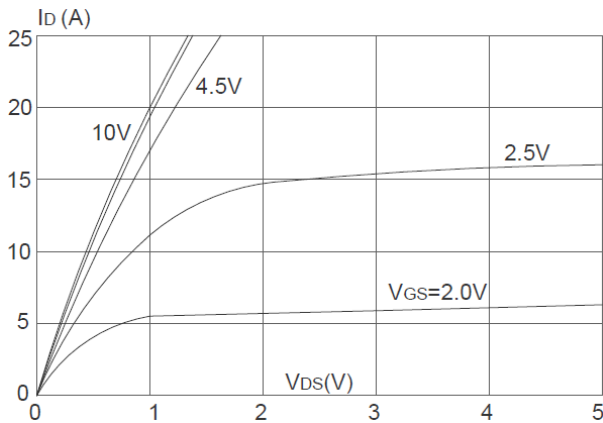
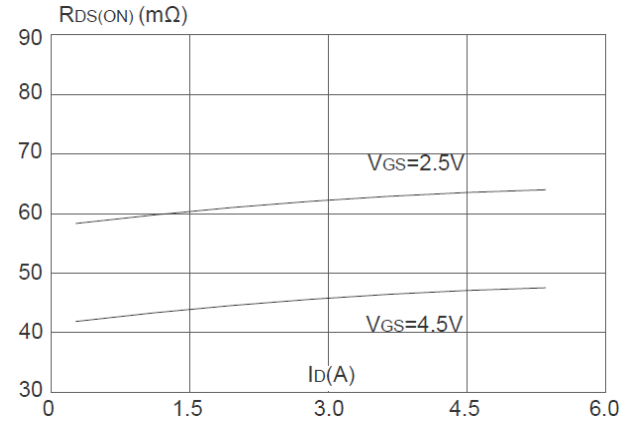
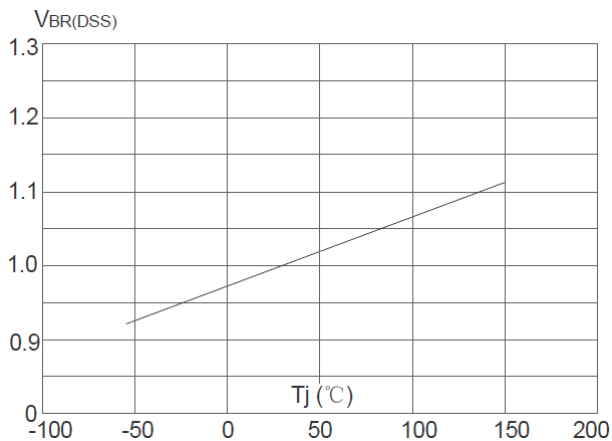


Fig 1 Typical Output Characteristics



**Fig 2 On-Resistance vs. Drain Current
and Gate Voltage**



**Fig 3 Normalized Breakdown Voltage
vs. Junction Temperature**

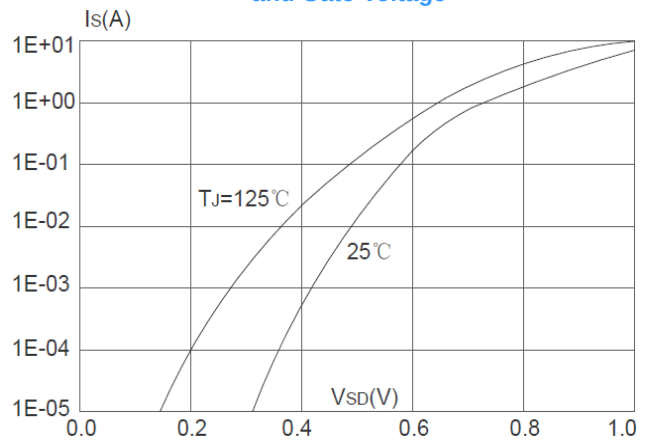
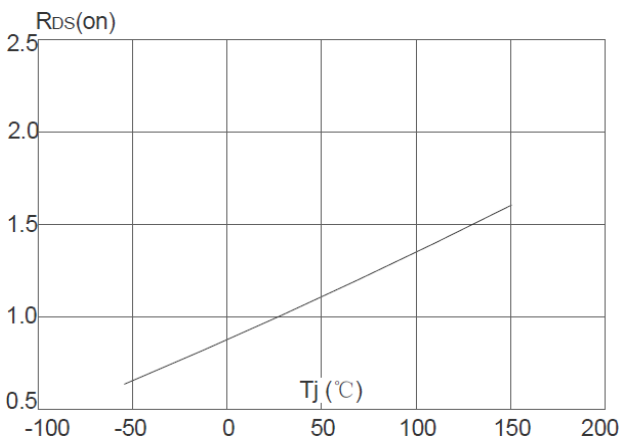


Fig 4 Body-Diode Characteristics



**Fig 5 Normalized On-Resistance vs. Junction
Temperature**

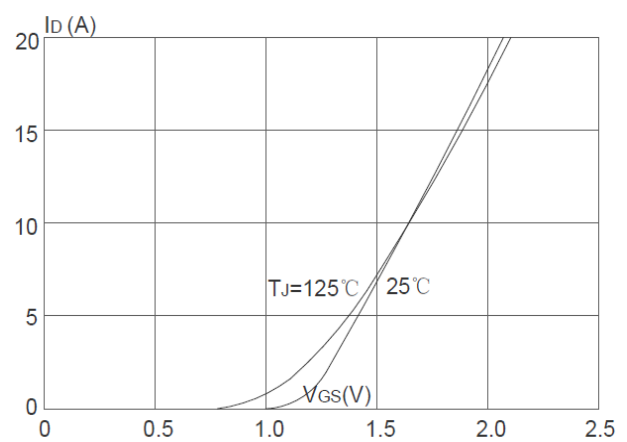


Fig 6 Transfer Characteristics

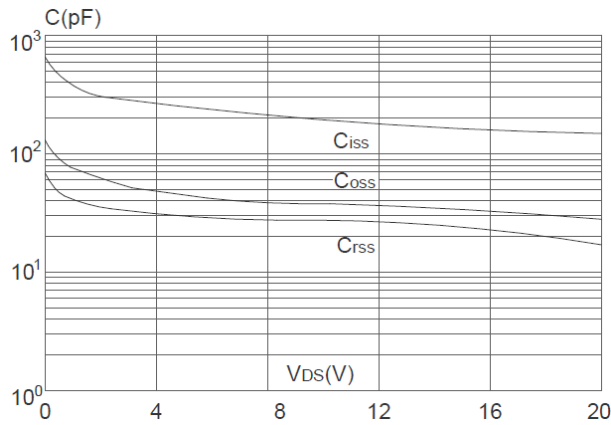


Fig 7 Capacitance Characteristics

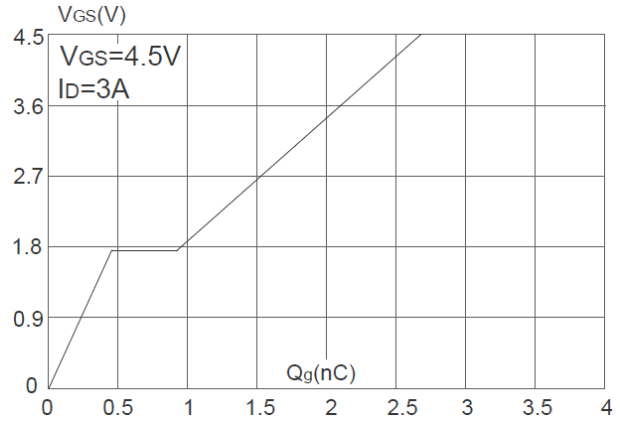
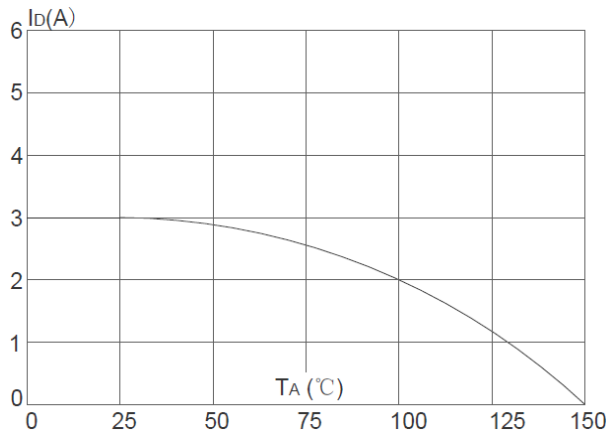


Fig 8 Gate-Charge Characteristics



**Fig 9 Maximum Continuous Drain Current
vs. Ambient Temperature**

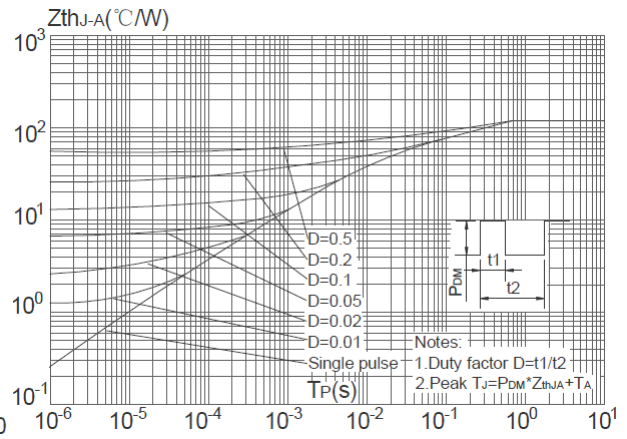


Fig 10 Maximum transient thermal impedance

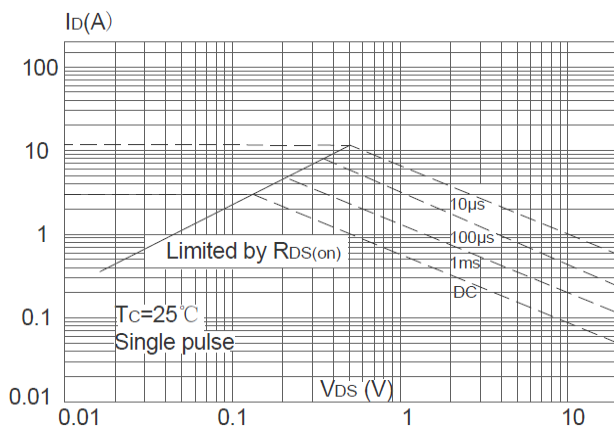


Fig 11 Safe Operation Area

Ratings and Characteristics Curves-G₂ (@ T_A = 25°C unless otherwise specified)

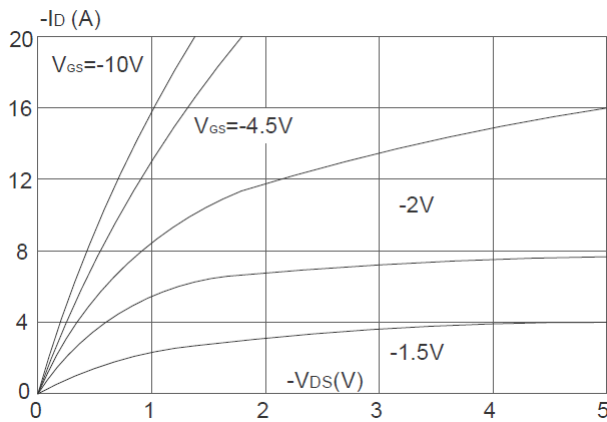
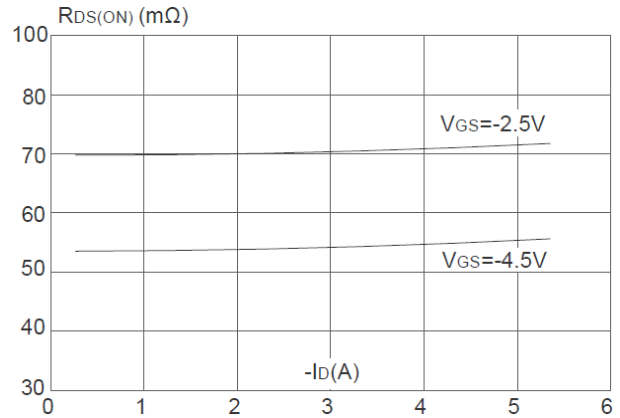
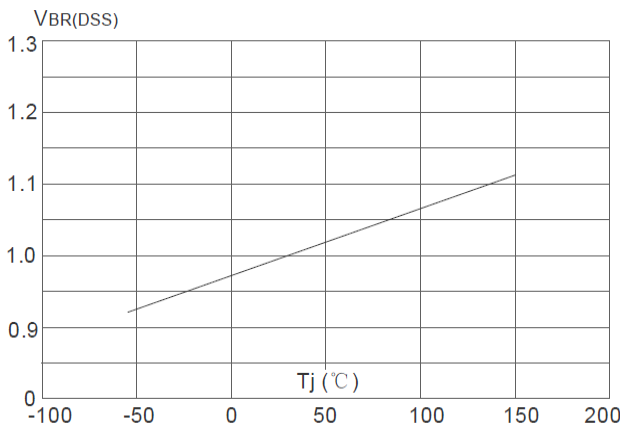


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**Fig 2 On-Resistance vs. Drain Current
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**Fig 3 Normalized Breakdown Voltage
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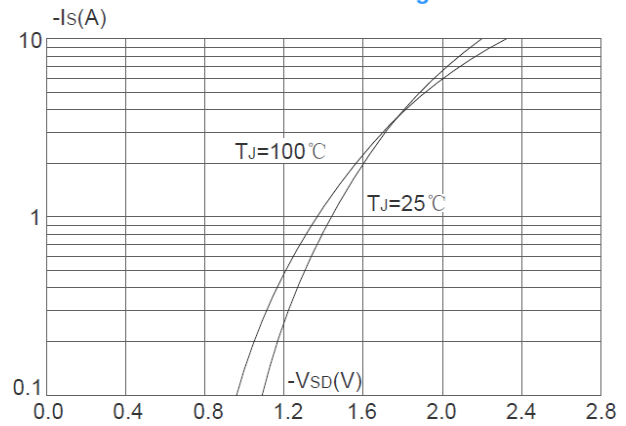
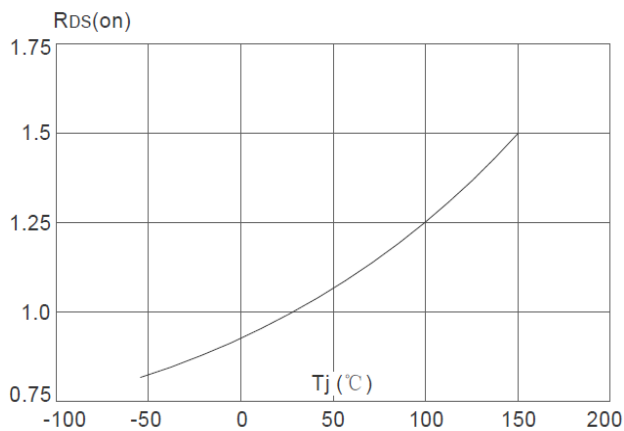


Fig 4 Body-Diode Characteristics



**Fig 5 Normalized On-Resistance vs. Junction
Temperature**

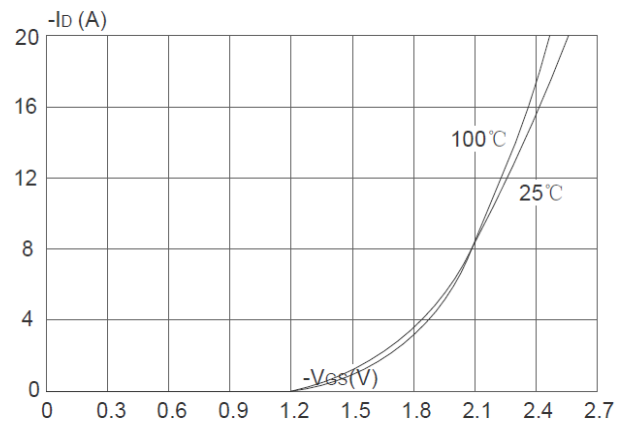


Fig 6 Transfer Characteristics

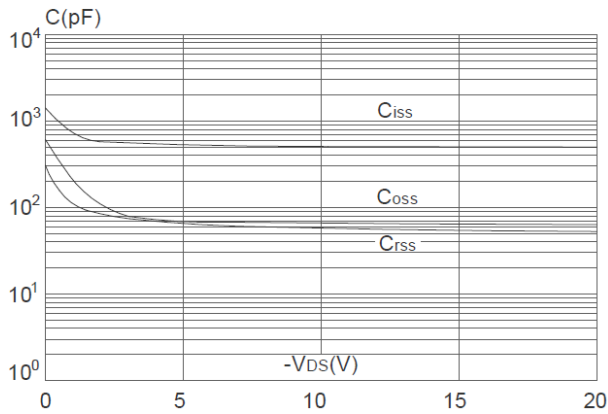


Fig 7 Capacitance Characteristics

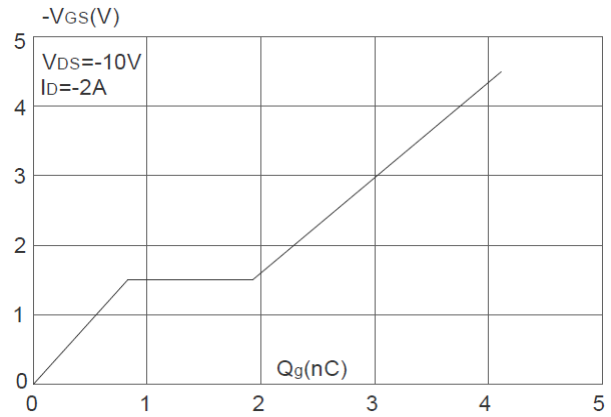
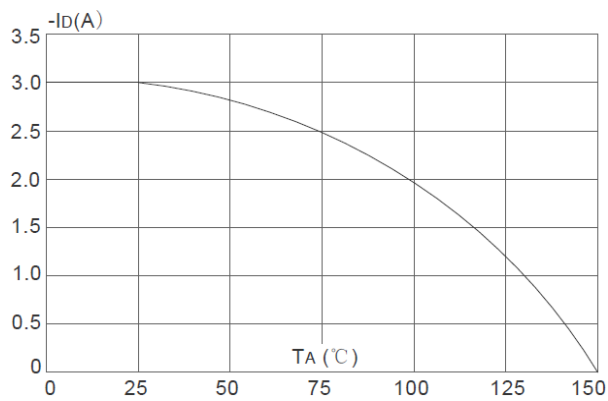


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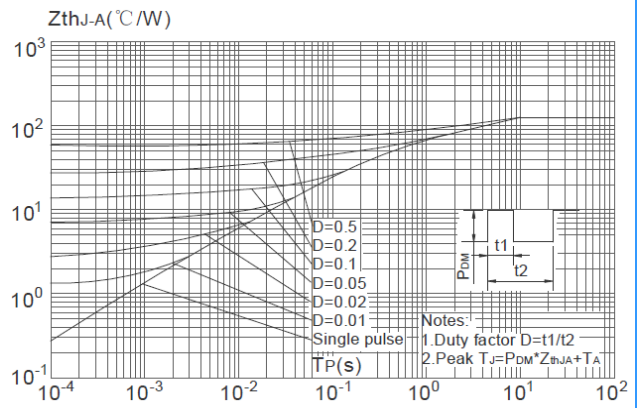


Fig 10 Maximum transient thermal impedance

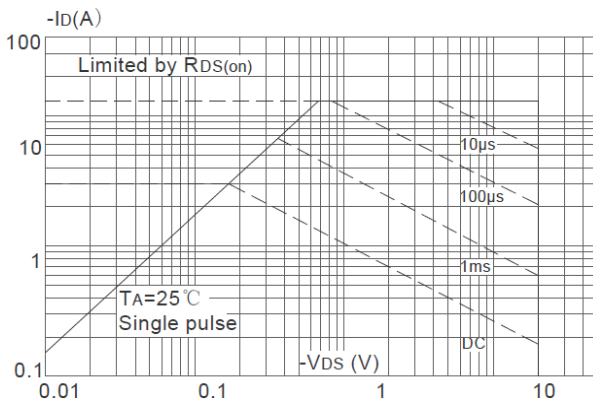
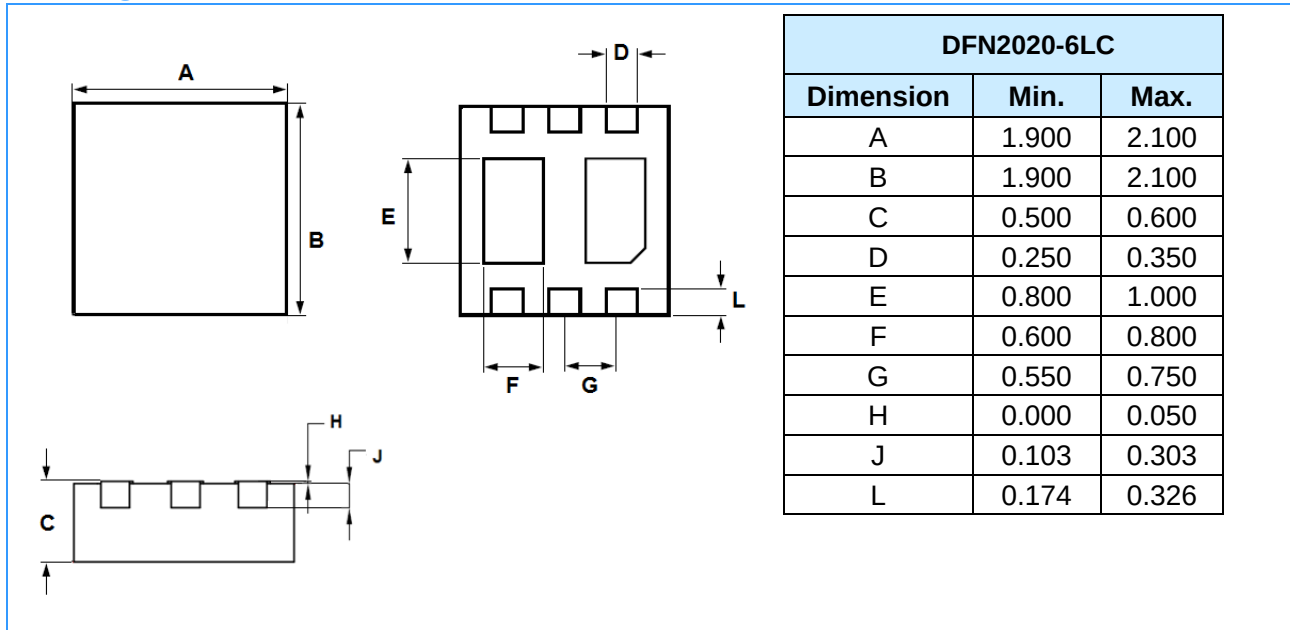


Fig 11 Safe Operation Area

Package Outline Dimensions (Unit: mm)



Mounting Pad Layout (Unit: mm)

