N-Ch and P-Ch Fast Switching MOSFETs

- ★ Super Low Gate Charge
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

Product Summary

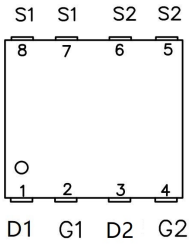
BVDSS	RDSON	ID
20V	12mΩ	8A
-20V	17mΩ	-8A

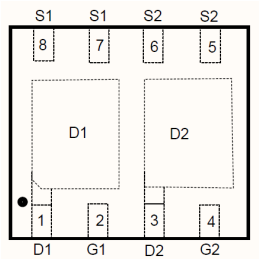
Description

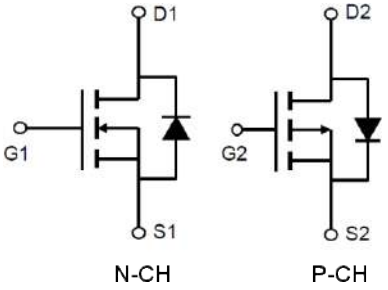
The XR8G02M is the high cell density trenched N-ch and P-ch MOSFETs, which provides excellent RDSON and gate charge for most of the synchronous buck converter applications.

The XR8G02M meets the RoHS and Green Product requirements with 100% full function reliability approved.

DFN2020-8L Pin Configuration







Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Rating		Units
		N-Ch	P-Ch	
V_{DS}	Drain-Source Voltage	20	-20	V
V_{GS}	Gate-Source Voltage	±12	±12	V
I_D@Ta=25°C	Continuous Drain Current, V_{GS} @ 10V[1]	8	-8	A
I_D@Ta=75°C	Continuous Drain Current, V_{GS} @ 10V[1]	6	-6	A
I_{DM}	Pulsed Drain Current[2]	32	-28	A
IAS ,IAR	Avalanche energy[3]	16	-27	A
P_D@T_C=25°C	Total Power Dissipation[4]	15	20	W
T_{STG}	Storage Temperature Range	-55 to 150	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	-55 to 150	°C

N-Channel Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	20	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=20V, V_{GS}=0V	-	-	1	μA
Gate-body leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±12V	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.5	0.7	1.5	V
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=5A	-	12	15	mΩ
		V_{GS}=2.5V, I_D=5A	-	16	23	
Forward transconductance	gfs	V_{DS}=5V, I_D=5A	-	15	-	S
Dynamic Characteristics						
Input capacitance	C_{ISS}	V_{DS}=15V ,V_{GS}=0V f=1.0MHz	-	740	-	pF
Output capacitance	C_{OSS}		-	110	-	
Reverse transfer capacitance	C_{RSS}		-	82	-	
Gate resistance	Rg	V_{GS}=0V, V_{DS}=0V, f=1.0MHz	-	1.1	-	Ω
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	V_{DS}=15V V_{GS}=10V R_L=1.8Ω R_{GEN}=3Ω	-	5	-	ns
Rise time	tr		-	3.5	-	
Turn-off delay time	$t_{D(OFF)}$		-	9	-	
Fall time	tf		-	3.5	-	
Total gate charge	Qg	V_{DS}=15V,I_D=5A V_{GS}=10V	-	15	-	nC
Gate-source charge	Qgs		-	2.5	-	
Gate-drain charge	Qgd		-	3	-	

P-Channel Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-20	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V	-	-	-1	μA
Gate-body leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±12V	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.5	-0.7	-1.5	V
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-5A	-	17	25	mΩ
		V_{GS}=-2.5V, I_D=-5A	-	24	30	
Forward transconductance	gfs	V_{DS}=-5V, I_D=-5A	-	18	-	S
Dynamic Characteristics						
Input capacitance	C_{ISS}	V_{DS}=-15V ,V_{GS}=0V f=1.0MHz	-	1040	-	pF
Output capacitance	C_{OSS}		-	180	-	
Reverse transfer capacitance	C_{RSS}		-	125	-	
Gate resistance	Rg	V_{GS}=0V, V_{DS}=0V, f=1.0MHz	-	4	-	Ω
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	V_{DS}=-15V V_{GS}=-10V R_L=2.3Ω R_{GEN}=3Ω	-	10	-	ns
Rise time	tr		-	5.5	-	
Turn-off delay time	$t_{D(OFF)}$		-	3.6	-	
Fall time	tf		-	4.6	-	
Total gate charge	Qg	V_{DS}=-15V,I_D=-5A V_{GS}=-10V	-	19	-	nC
Gate-source charge	Qgs		-	3.6	-	
Gate-drain charge	Qgd		-	4.6	-	

N-Channel Typical Characteristics

Figure1: Output Characteristics

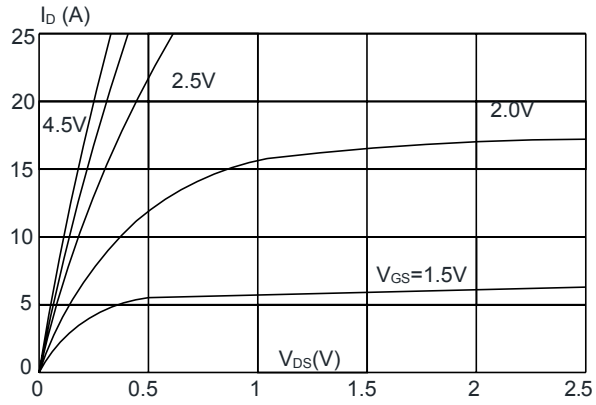


Figure 2: Typical Transfer Characteristics

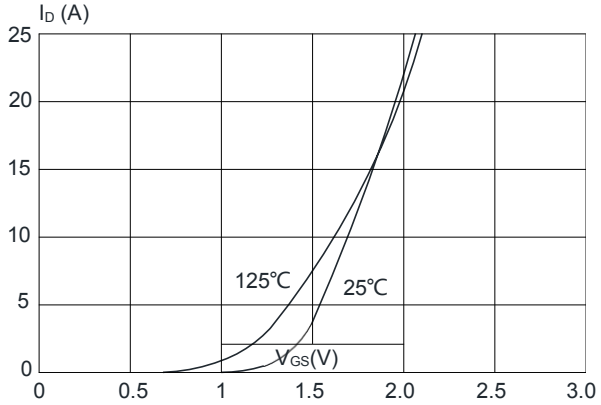


Figure 3: On-resistance vs. Drain Current

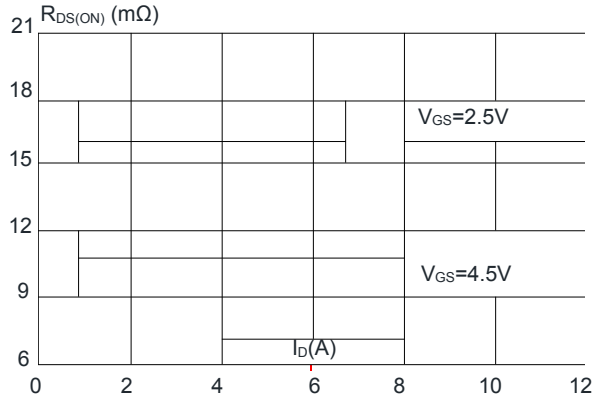


Figure 4: Body Diode Characteristics

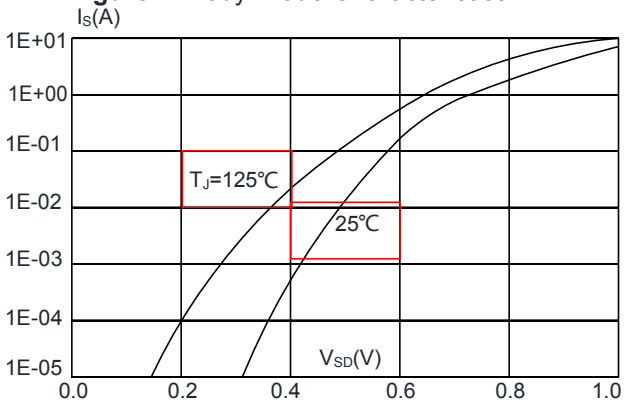


Figure 5: Gate Charge Characteristics

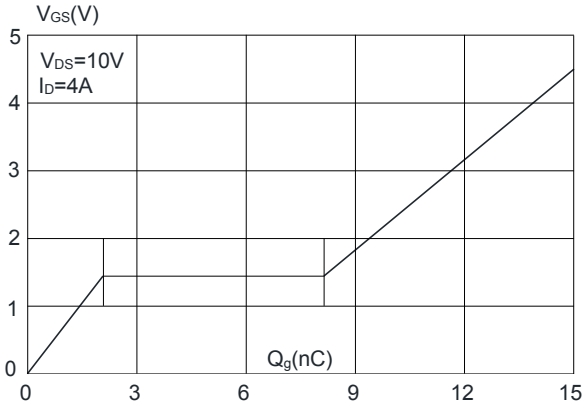


Figure 6: Capacitance Characteristics

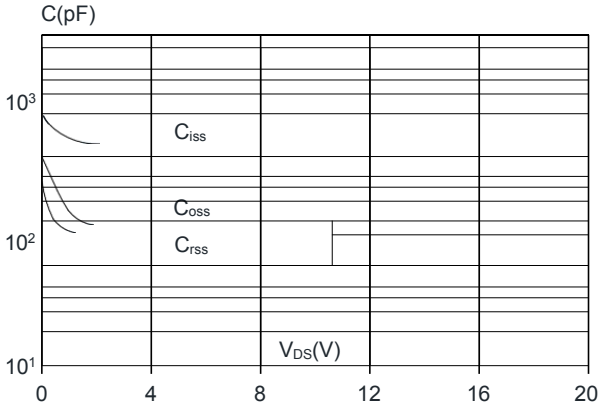


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

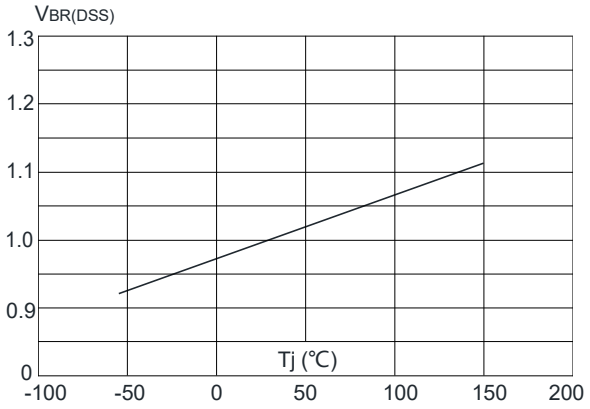


Figure 8: Normalized on Resistance vs. Junction Temperature

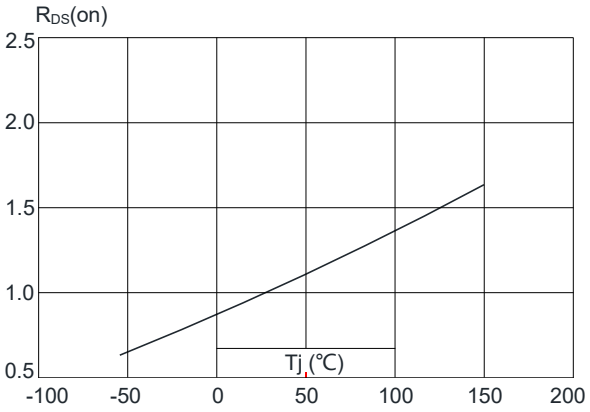


Figure 9: Maximum Safe Operating Area

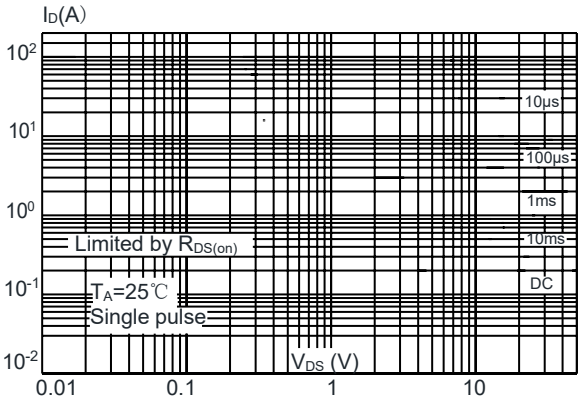


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

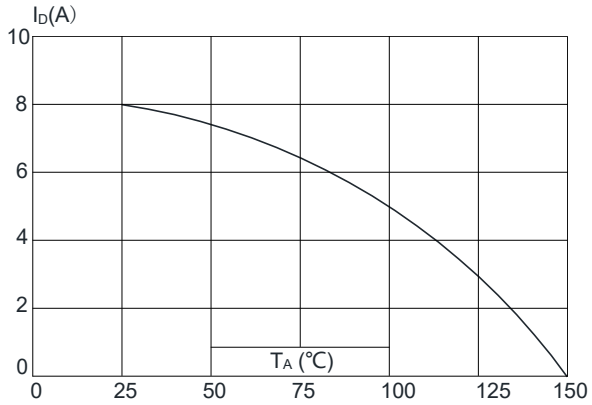
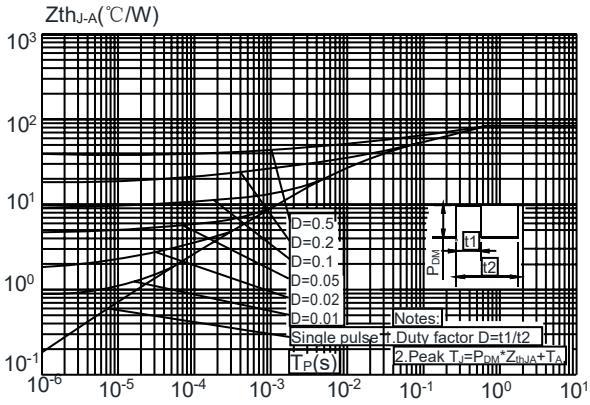


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



P-Channel Typical Characteristics

Figure1: Output Characteristics

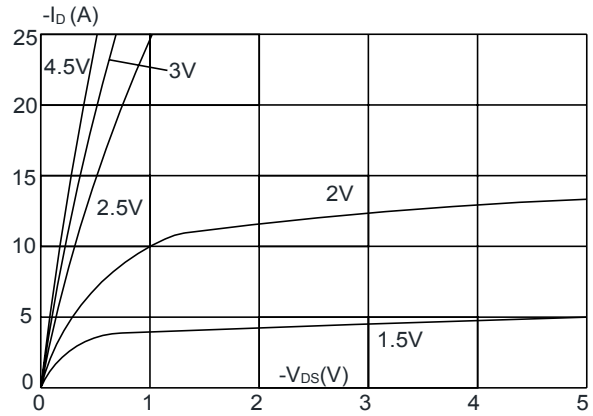


Figure 2: Typical Transfer Characteristics

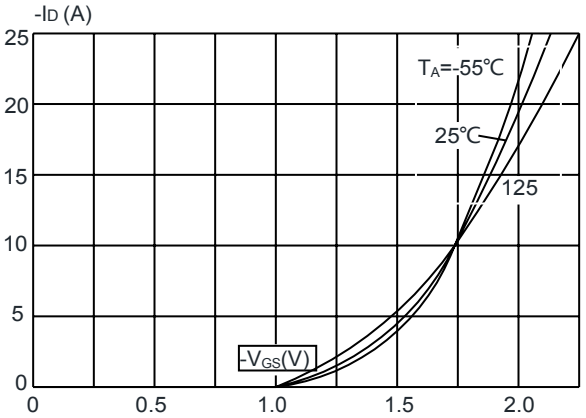


Figure 3: On-resistance vs. Drain Current

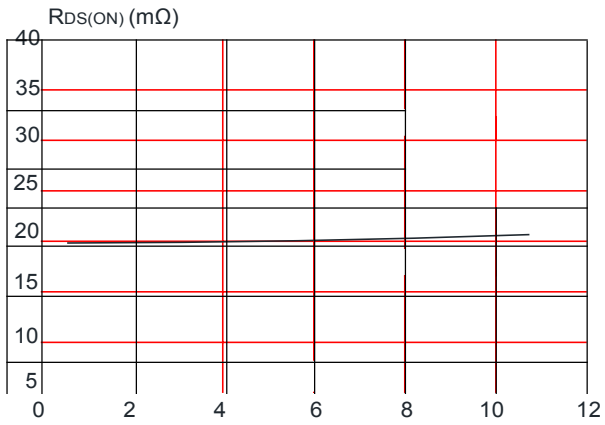


Figure 4: Body Diode Characteristics

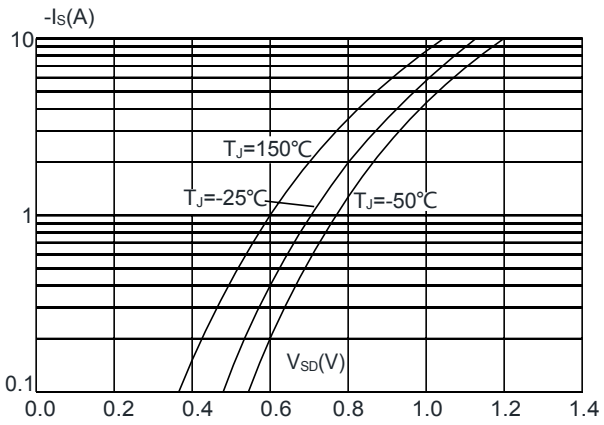


Figure 5: Gate Charge Characteristics

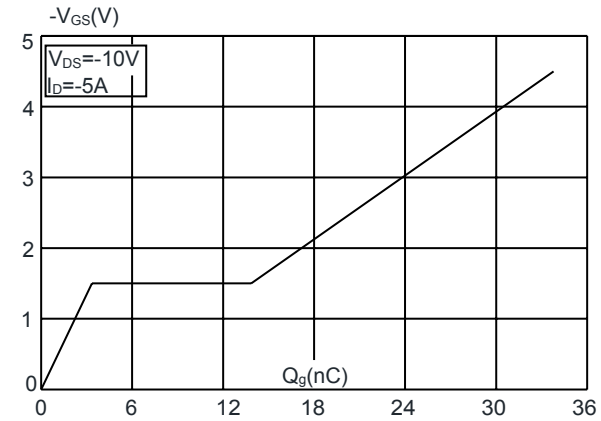


Figure 6: Capacitance Characteristics

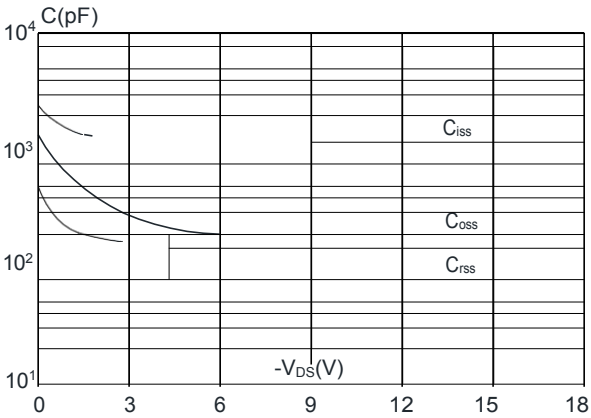


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

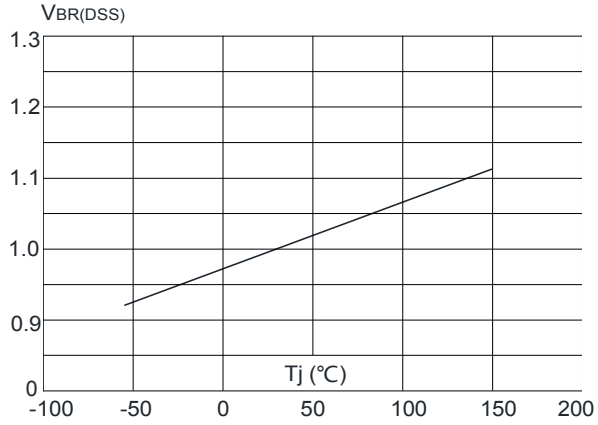


Figure 8: Normalized on Resistance vs. Junction Temperature

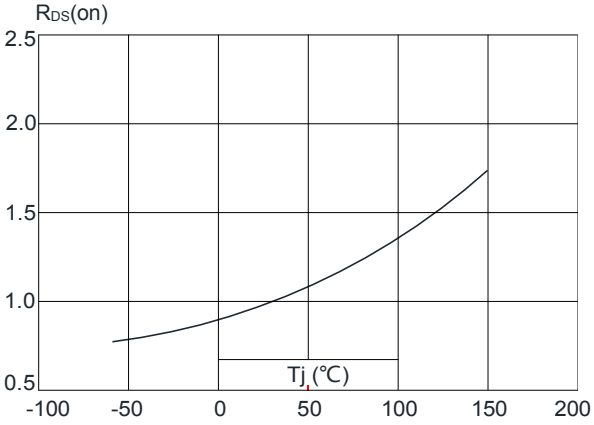


Figure 9: Maximum Safe Operating Area

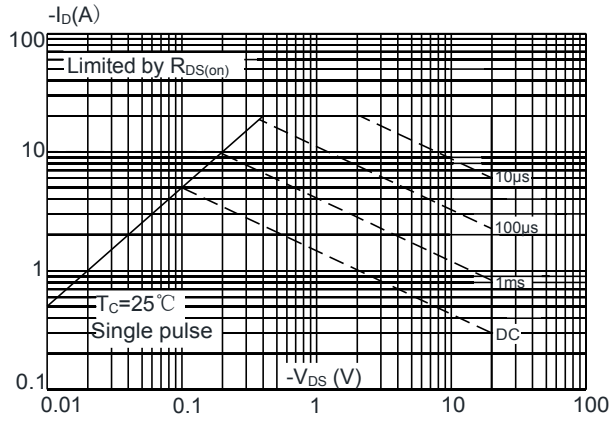


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

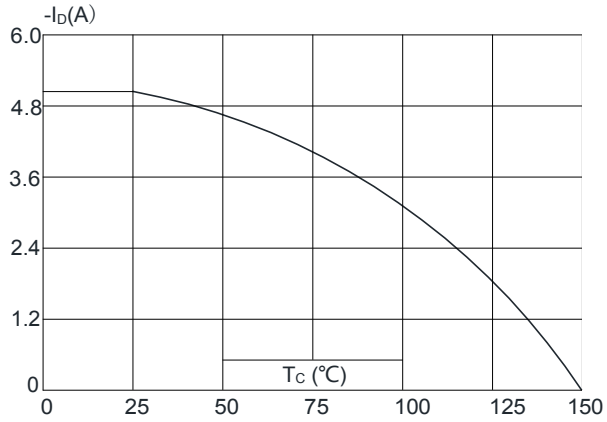
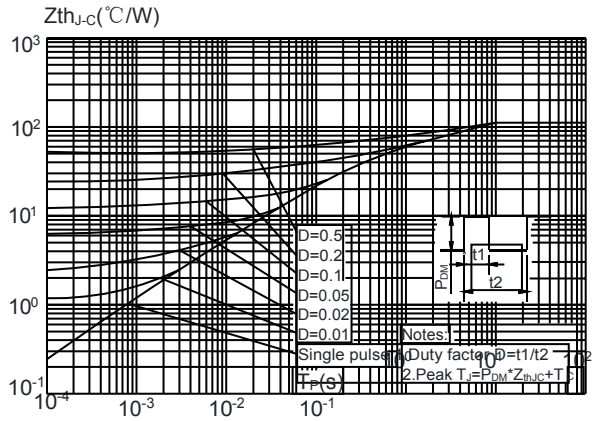
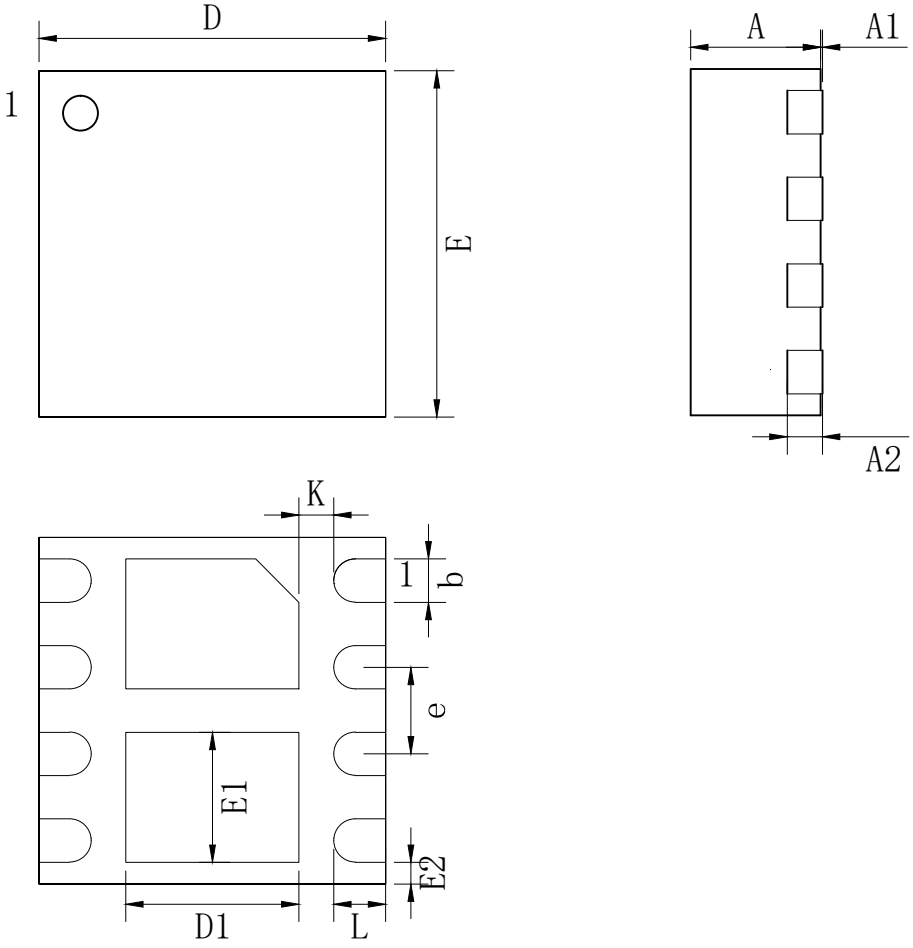


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Package Mechanical Data-DFN2020-8L



SYMBOL	MILLMETER		
	MIN	NOM	MAX
A	—	—	0.80
A1	0.00	—	0.05
A2	0.203 TIY		
b	0.20	0.25	0.30
D	1.95	2.00	2.05
D1	0.95	1.00	1.05
E	1.95	2.00	2.05
E1	0.70	0.75	0.80
E2	0.125 TIY		
e	0.50 BSC		
K	0.20 BSC		
L	0.25	0.30	0.35