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

Description

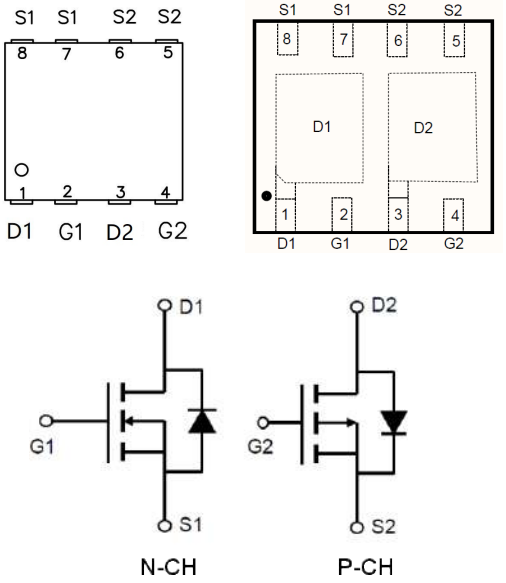
The XR8G02M is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The XR8G02M meet the RoHS and Green Product requirement with full function reliability approved.

Product Summary

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

DFN2020-8L Pin Configuration



Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

Parameter		Symbol	Limit		Unit
			N	P	
Drain-source voltage		V_{DS}	20	-20	V
Gate-source voltage		V_{GS}	±12	±12	V
Operating junction Temperature range		T_j	-55—150	-55—150	℃
Drain Current-Continuous (Silicon Limited)	T_A=25°C	I_D	8	-8	A
	T_A=75°C		6	-6	

Pulsed Drain Current (Package Limited)		I_{DM}	32	-28	A
Avalanche Current C		I_{AS}, I_{AR}	16	-27	A
Avalanche energy L=0.1mH C		E_{AS}, E_{AR}	20	36	mJ
Power Dissipation B	T_A=25°C	P_D	15	20	W
	T_A=75°C		4	8	
Junction and Storage Temperature Range		T_J, T_{STG}	-55—150		℃

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

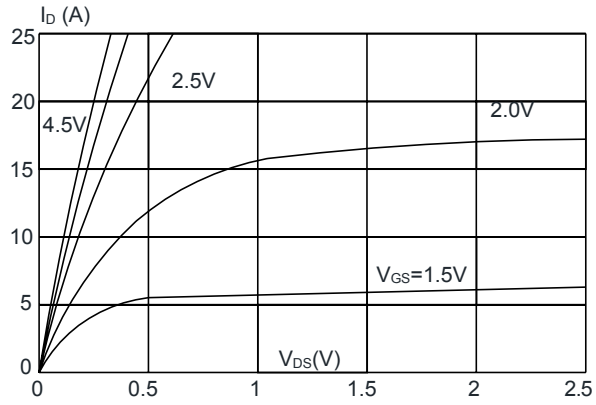


Figure 2: Typical Transfer Characteristics

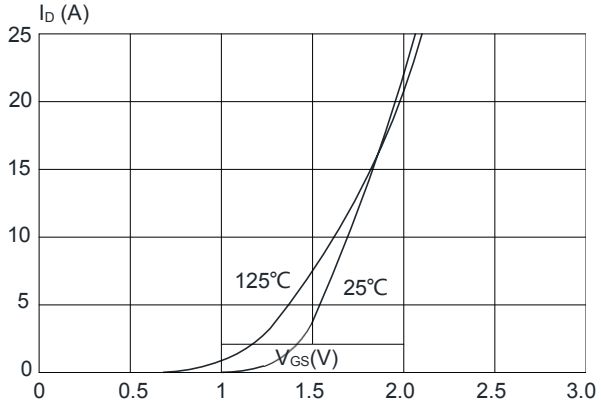


Figure 3: On-resistance vs. Drain Current

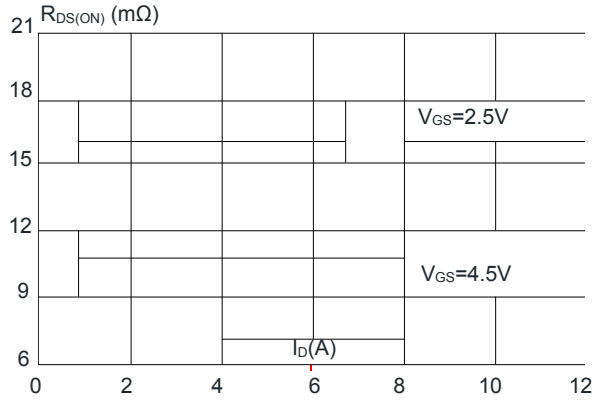


Figure 4: Body Diode Characteristics

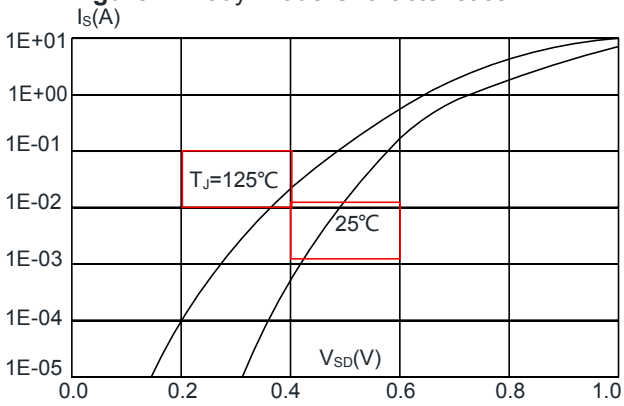


Figure 5: Gate Charge Characteristics

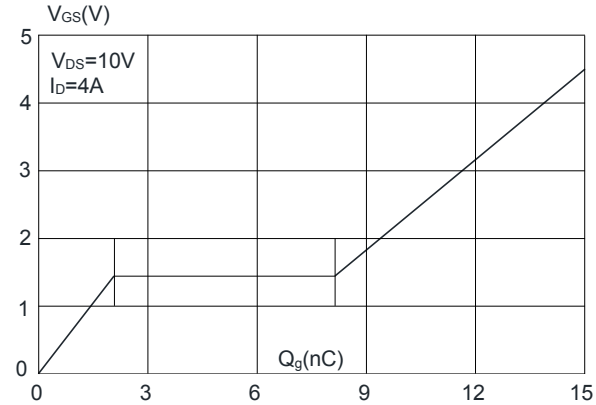


Figure 6: Capacitance Characteristics

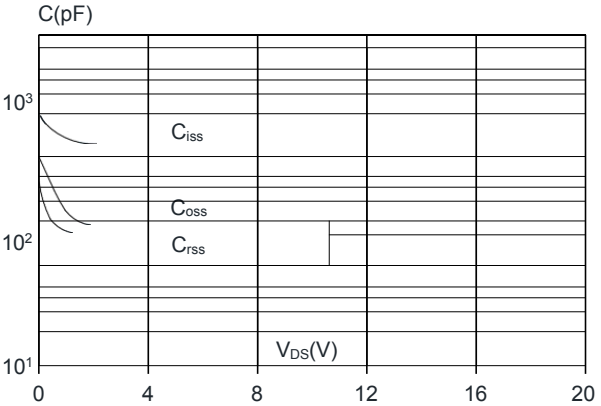


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

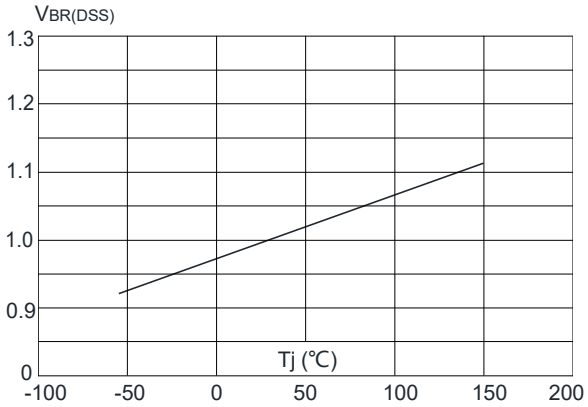


Figure 8: Normalized on Resistance vs. Junction Temperature

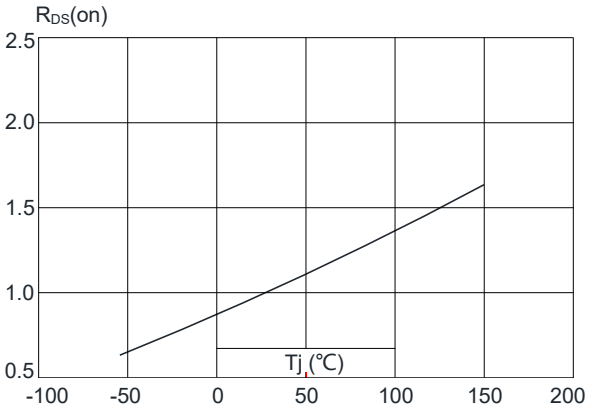


Figure 9: Maximum Safe Operating Area

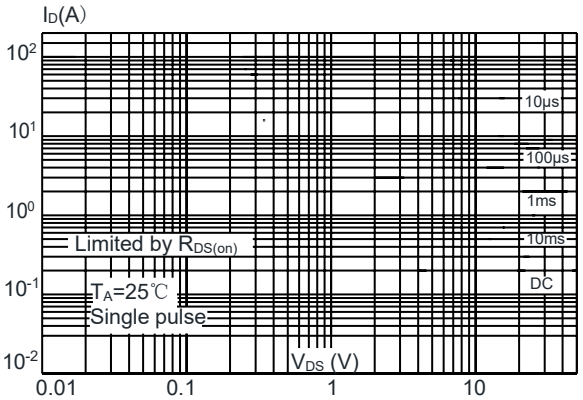


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

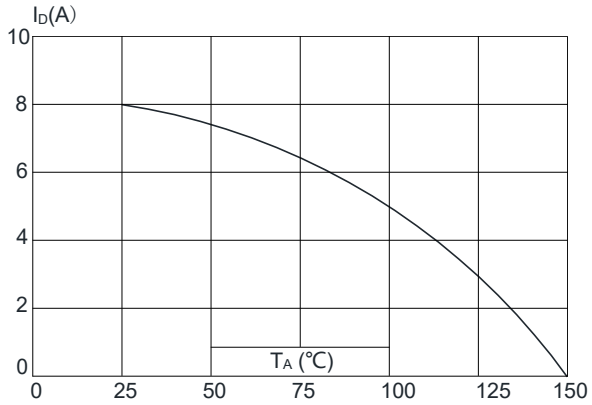
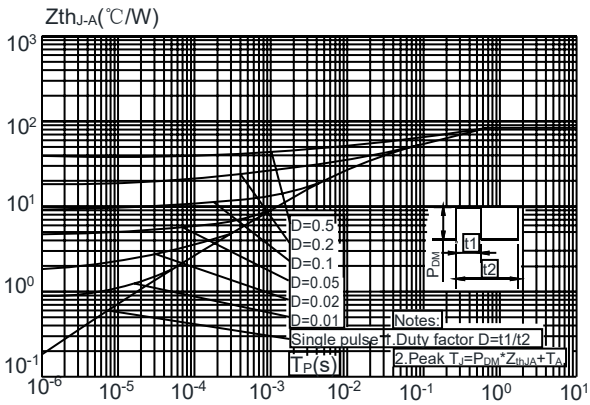


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



P-Channel Typical Characteristics

Figure1: Output Characteristics

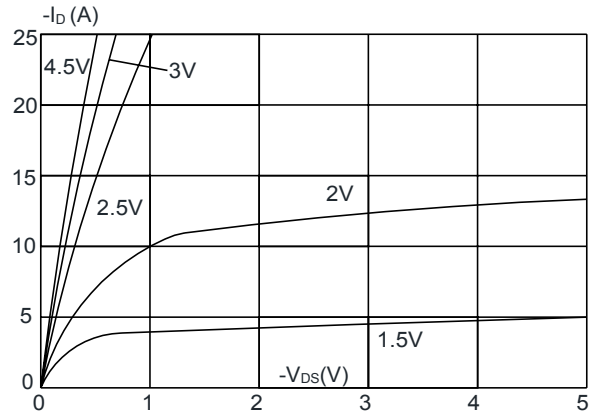


Figure 2: Typical Transfer Characteristics

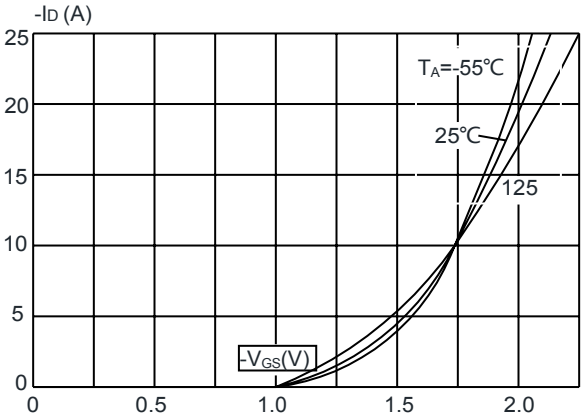


Figure 3: On-resistance vs. Drain Current

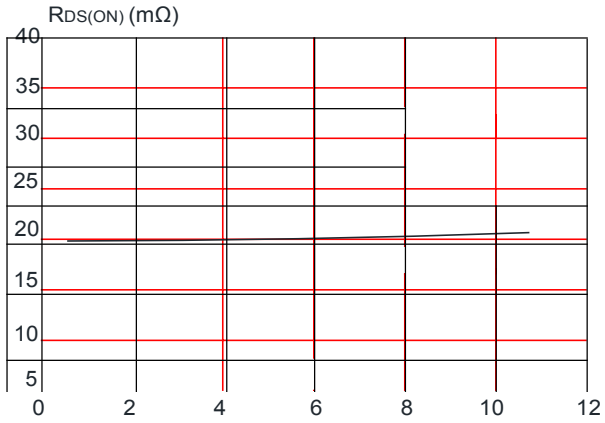


Figure 4: Body Diode Characteristics

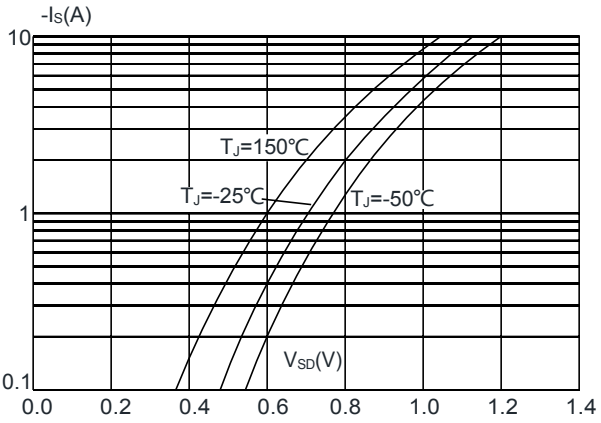


Figure 5: Gate Charge Characteristics

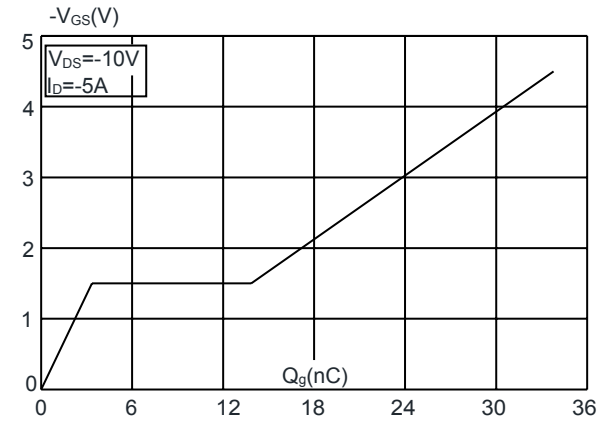


Figure 6: Capacitance Characteristics

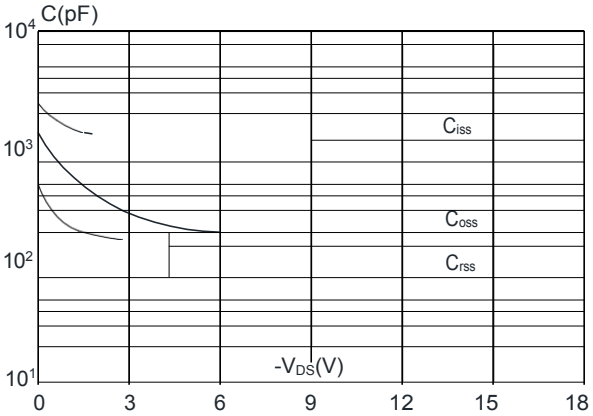


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

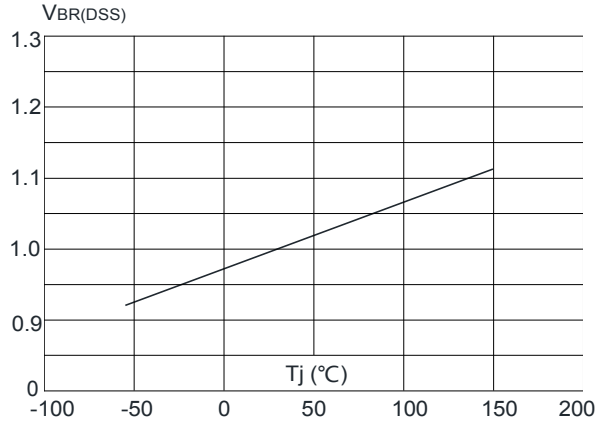


Figure 8: Normalized on Resistance vs. Junction Temperature

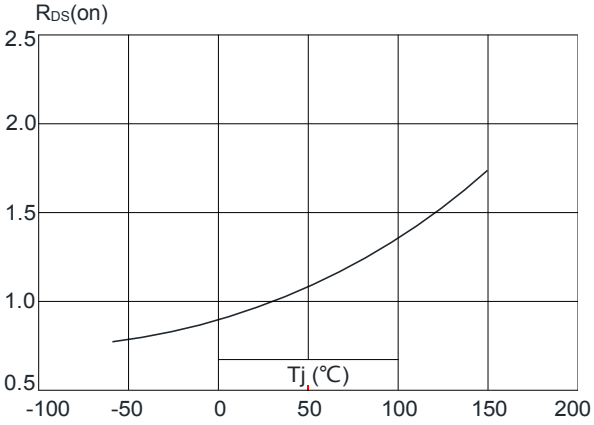


Figure 9: Maximum Safe Operating Area

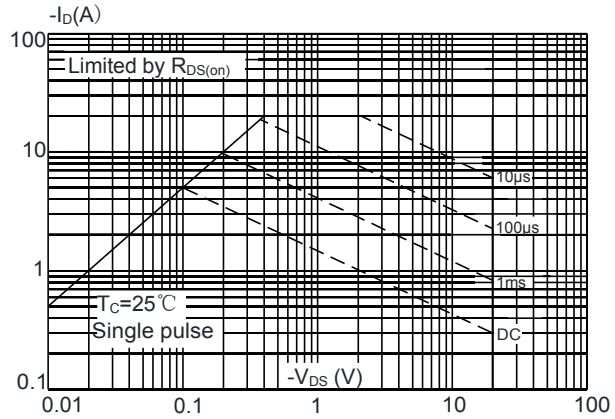


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

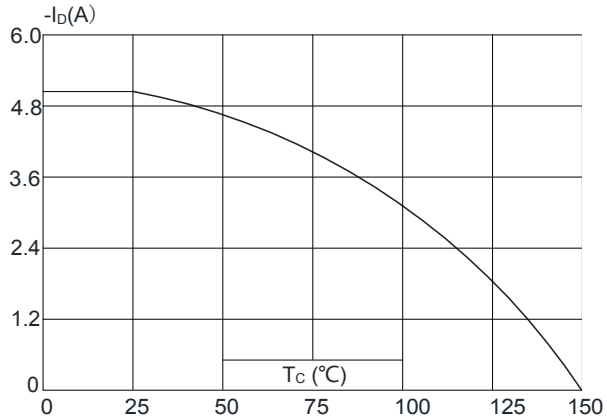
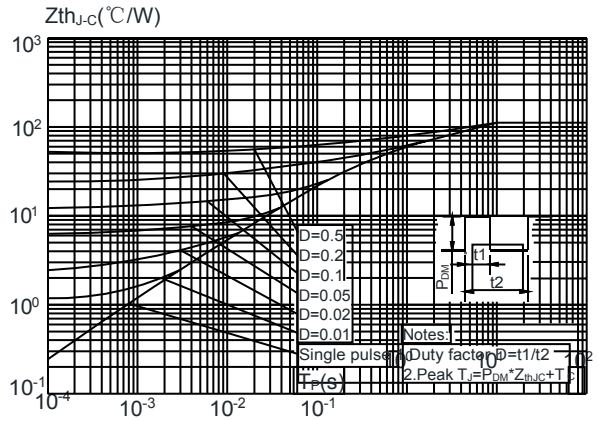
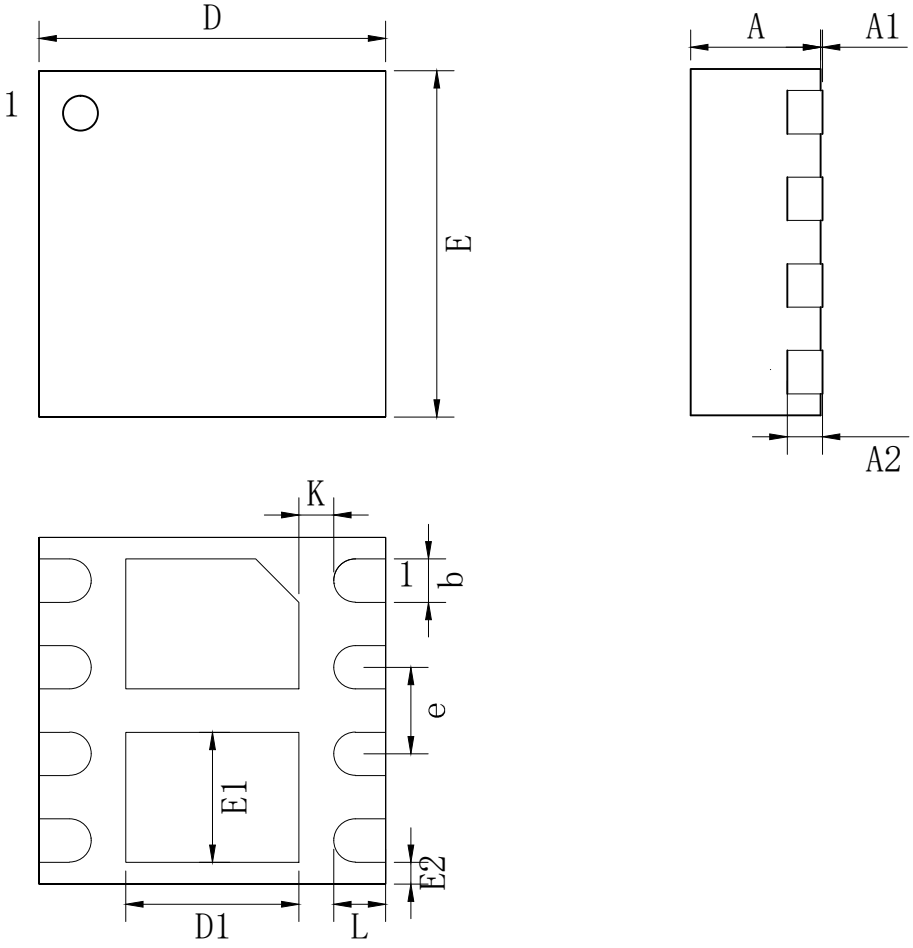


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



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