●General Description

It combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

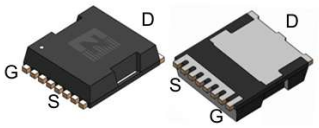
●Features

- ■Low $R_{DS(ON)}$ to minimize conductive loss
- ■Low Gate Charge for fast switching
- ■Low thermal resistance
- ■Wettable flank
- ■AEC-Q101 qualified

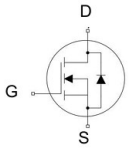
●Application

- ■BLDC motor driver
- ■DC-DC
- ■Load switch

●Product Summary



TOLL



V_{DS}=80V

$R_{DS(ON)}$ =1.5mR

I_D=309A

●Ordering Information

Part NO.	ZMSA015N08HR
Marking	ZMS015N08H
Packing information	REEL TAPE
Basic ordering unit (pcs)	2000

●Absolute Maximum Ratings (T_A=25℃,unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Max.	Unit
Drain-source voltage	V_{DS}	25℃≤Tj≤175℃	-	80	V
Gate-source voltage①	V_{GS}	DC; -55℃≤Tj≤175℃	-20	20	V
Continuous drain current	I_D	V_{GS}=10V, T_C=25℃	-	309	A
	I_D	V_{GS}=10V, T_C=75℃	-	252	A
	I_D	V_{GS}=10V, T_C=100℃	-	218	A
Pulsed drain current	I_{DM}	Pulsed; t_p ≤ 10 μs; T_C = 25 °C;	-	1236	A
Diode continuous current	I_S	V_{GS}=0V, T_C=25℃	-	288	A
Diode pulse current	$I_{S,pulse}$	Pulsed; t_p ≤ 10 μs; T_C = 25 °C;	-	1152	A
Total power dissipation	P_D	V_{GS}＞6V, T_C=25℃	-	375	W
Total power dissipation	P_D	V_{GS}＞6V, T_A=25℃	-	3.1	W
Operating junction temperature	T_J		-55	175	℃
Storage temperature	T_{STG}		-55	175	℃

Single pulse avalanche energy	E_{AS}	L=0.1mH, V_{GS}=10V, R_g=25Ω	-	657	mJ
Single pulse avalanche energy	E_{AS}	L=0.5mH, V_{GS}=10V, R_g=25Ω	-	1051	mJ
ESD level (HBM)			CLASS 2		

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	0.4	°C/W
Thermal resistance, junction - ambient	R_{thJA}②	-	-	48	°C/W
Soldering temperature	T_{sold}	-	-	260	°C

●Electronic Characteristics (T_j=25°C, unless otherwise specified)

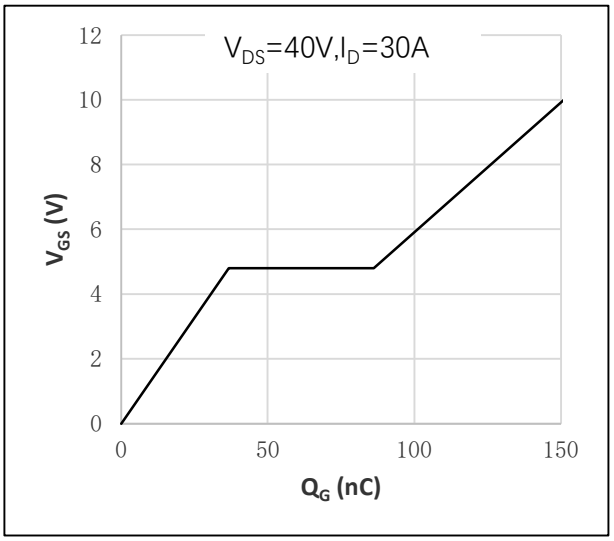
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	V_{GS} =0V, I_D =250uA, T_j=25℃	80	-	-	V
		V_{GS} =0V, I_D =1mA, T_j=-55℃	76.4	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250uA, T_j=25℃	2	3.2	4	V
		V_{GS}=V_{DS}, I_D=1mA, T_j=-55℃	-	-	4.5	V
		V_{GS}=V_{DS}, I_D=1mA, T_j=175℃	1.1	-	-	V
Drain-source leakage current	I_{DSS}	V_{GS}=0V, V_{DS}=80V, T_j=25℃	-	-	1	uA
		V_{GS}=0V, V_{DS}=80V, T_j=175℃	-	-	500	uA
Gate- source leakage current	I_{GSS}	V_{GS}=±20V, V_{DS} =0V	-	-	±100	nA
Static drain-source on resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=30A, T_j=25℃	-	1.5	1.9	mΩ
		V_{GS}=10V, I_D=30A, T_j=175℃	-	3.1	-	mΩ
Forward transconductance	g_{FS}	V_{DS} =5V, I_D = 10A	-	35	-	S
Diode forward voltage	V_{FSD}	V_{GS} =0V, I_{SD} = 30A	-	0.8	1.3	V

●Dynamic characteristics (T_j=25°C, unless otherwise specified)

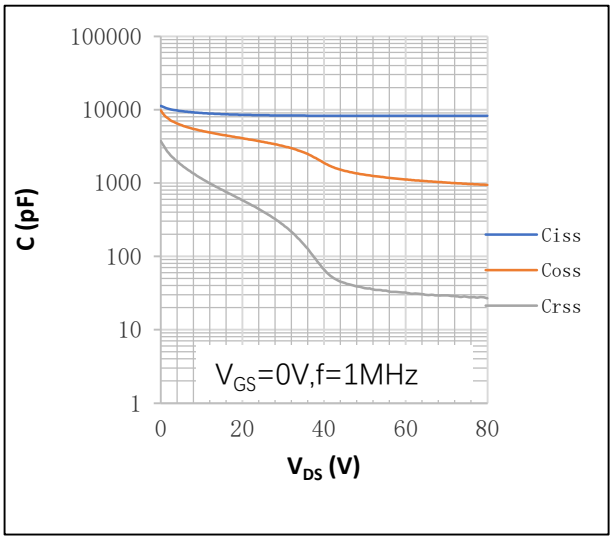
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	f = 1MHz, V_{DS}=40V, V_{GS}=0V	-	8291	-	pF
Output capacitance	C_{oss}		-	1838	-	pF
Reverse transfer capacitance	C_{rss}		-	63	-	pF
Gate resistance	R_g	f = 1MHz	-	2.4	-	Ω
Total gate charge	Q_g	V_{DD} = 40V, I_D = 30A, V_{GS} = 10V	-	151	-	nC
Gate-source charge	Q_{gs}		-	36.7	-	nC
Gate-drain charge	Q_{gd}		-	49.5	-	nC

Turn-on delay time	$t_{D(on)}$	V_{GS}=10V, V_{DS}=40V, R_G =3.3Ω, I_D =30A	-	19	-	ns
Turn-on rise time	t_r		-	14	-	ns
Turn-off delay time	$t_{D(off)}$		-	31	-	ns
Turn-off fall time	t_f		-	37	-	ns
Reverse recovery time	t_{rr}	V_{DD}=40V, dI_S/dt = 100A/us, I_S=30A	-	76	-	ns
Reverse recovery charge	Q_{rr}		-	120	-	nC

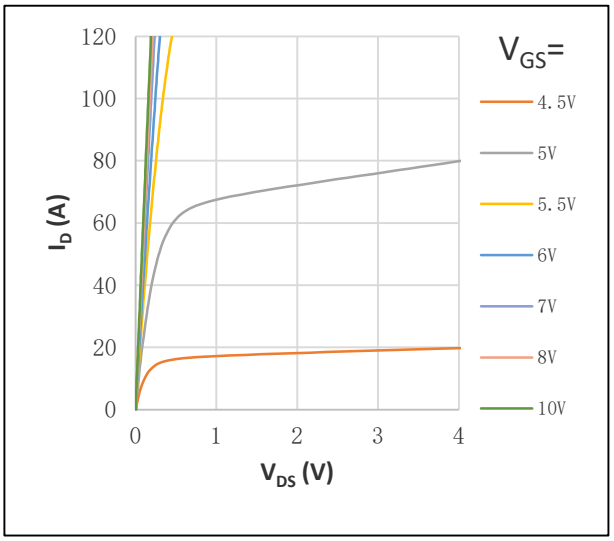
●Fig.1 Gate-source voltage as a function of gate charge; Typical values; T_j=25℃



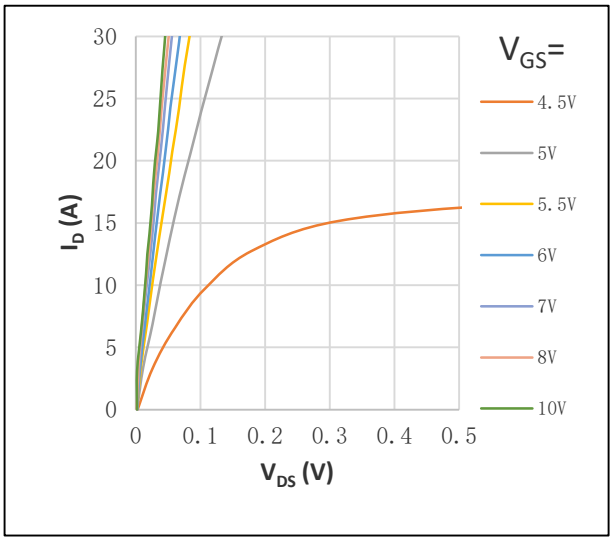
●Fig.2 Input, output and reverse transfer capacitances as a function of drain-source voltage; Typical values; T_j=25℃



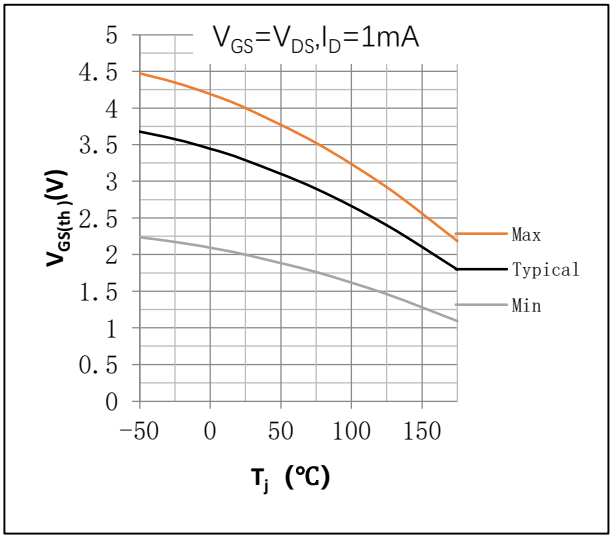
●Fig.3 Output characteristics: drain current as a function of drain-source voltage; Typical values; T_j=25℃



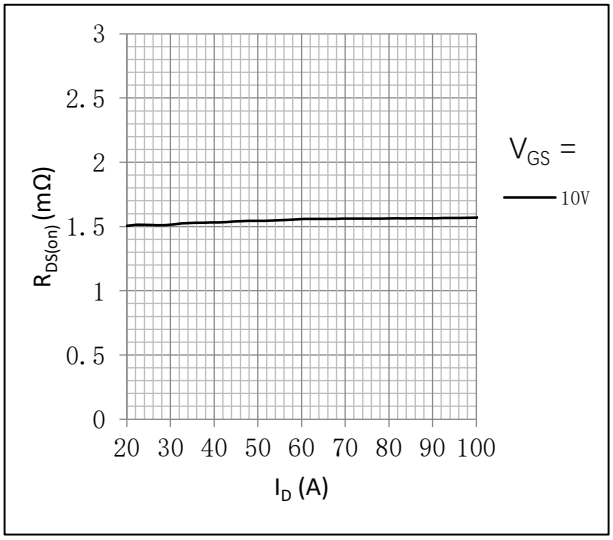
●Fig.4 Output characteristics: drain current as a function of drain-source voltage; Typical values: Expanded curve; T_j=25℃



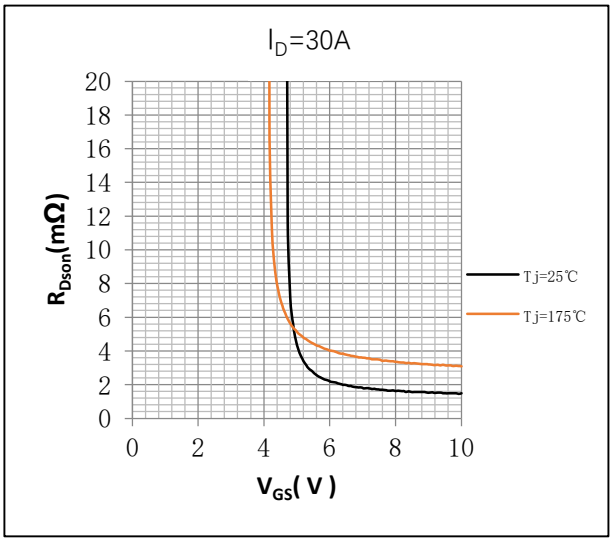
●Fig.5 Gate-source threshold voltage as a function of junction temperature; Typical/Min/Max values



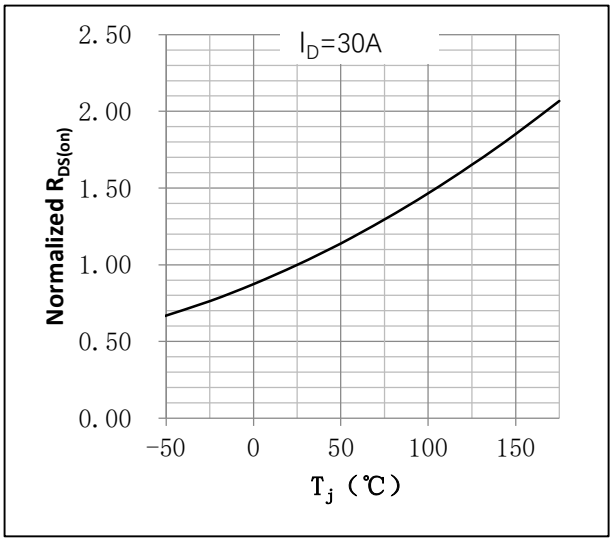
●Fig.6 Drain-source on-state resistance as a function of drain current; Typical values; Tj=25℃



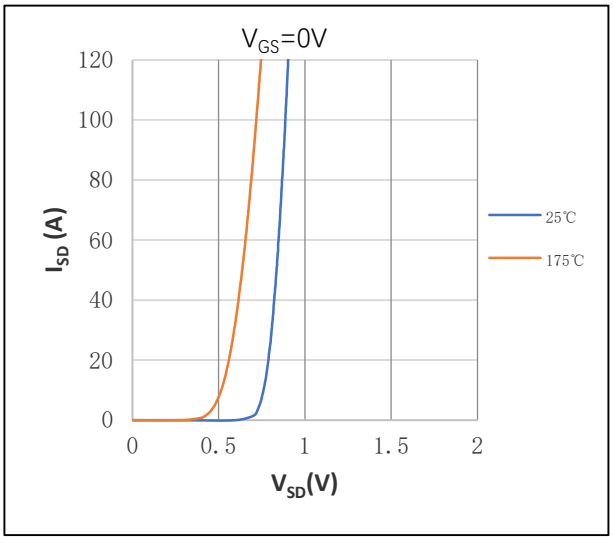
●Fig.7 Drain-source on-state resistance as a function of gate-source voltage; Typical values



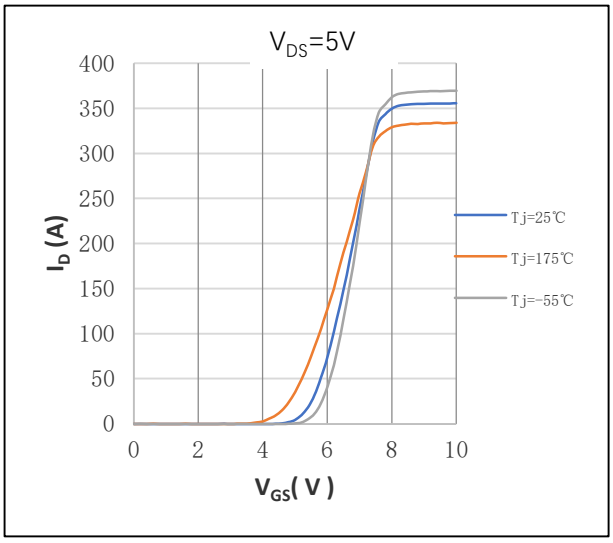
●Fig.8 Normalized drain-source on-state resistance factor as a function of junction temperature; Typical values Normalized On-Resistance=R_{DSon}/R_{DSon}(25℃)



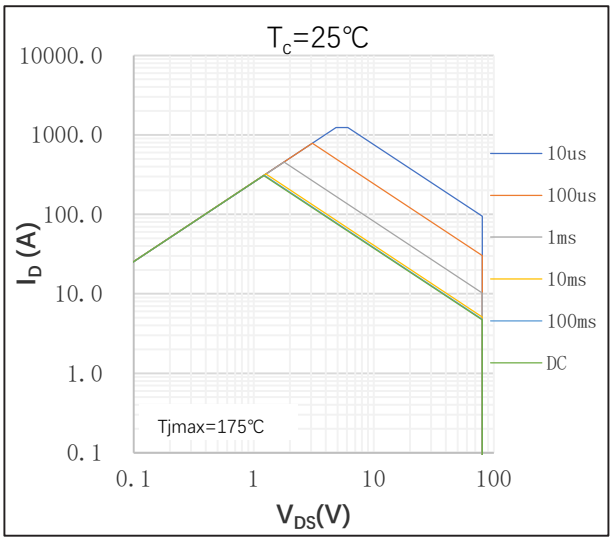
●Figure 9. Source (diode forward) current as a function of source-drain (diode forward) voltage; Typical values



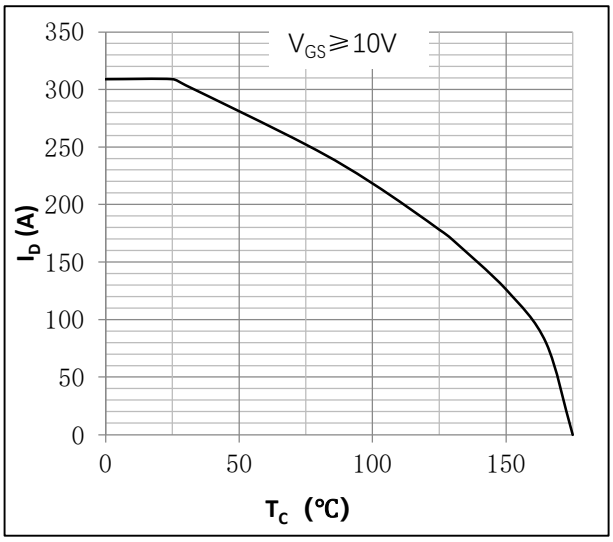
●Figure 10. Transfer characteristics: drain current as a function of gate-source voltage; Typical values



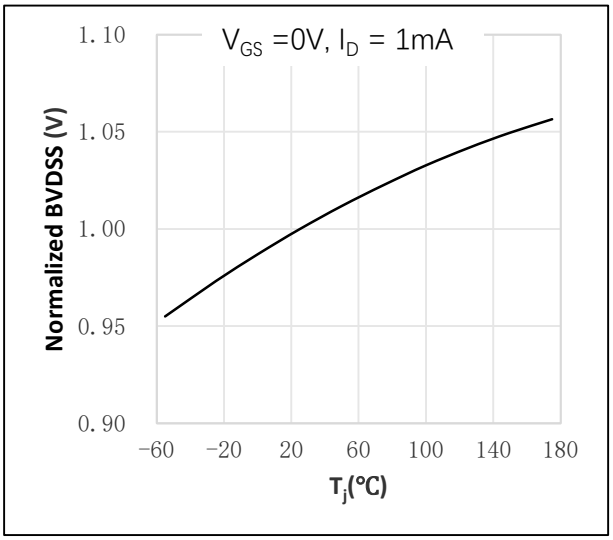
●Fig.11 Safe operating area: continuous and peak drain currents as a function of drain-source voltage; Calculative values



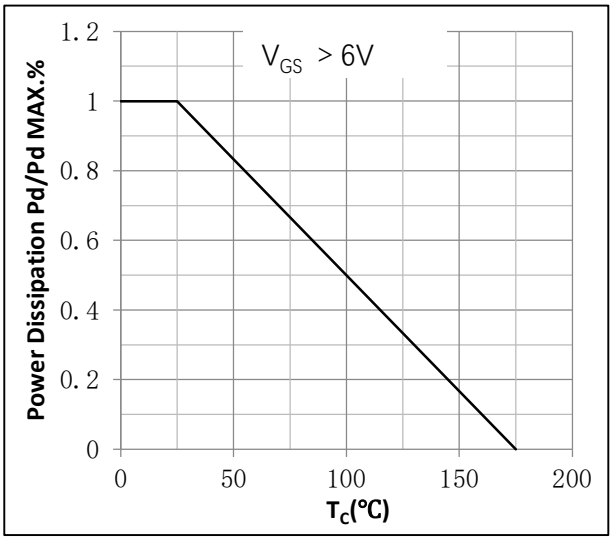
●Fig.12 Continuous drain current as a function of case temperature③;Calculative values



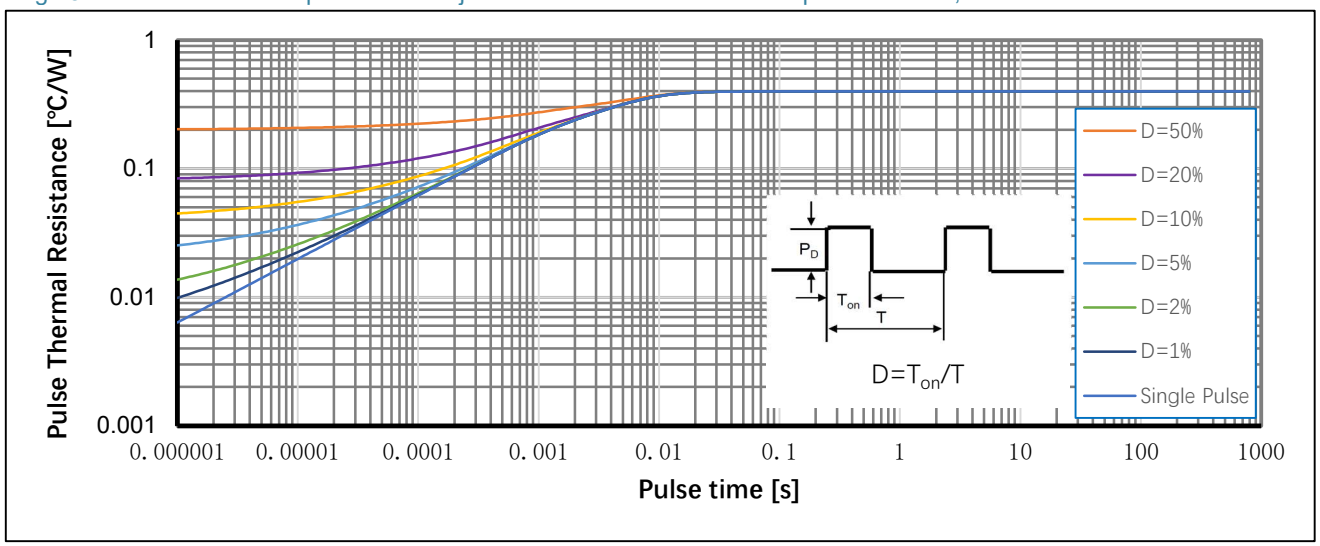
●Fig.13 Drain-source breakdown voltage as a function of junction temperature; Normalized values



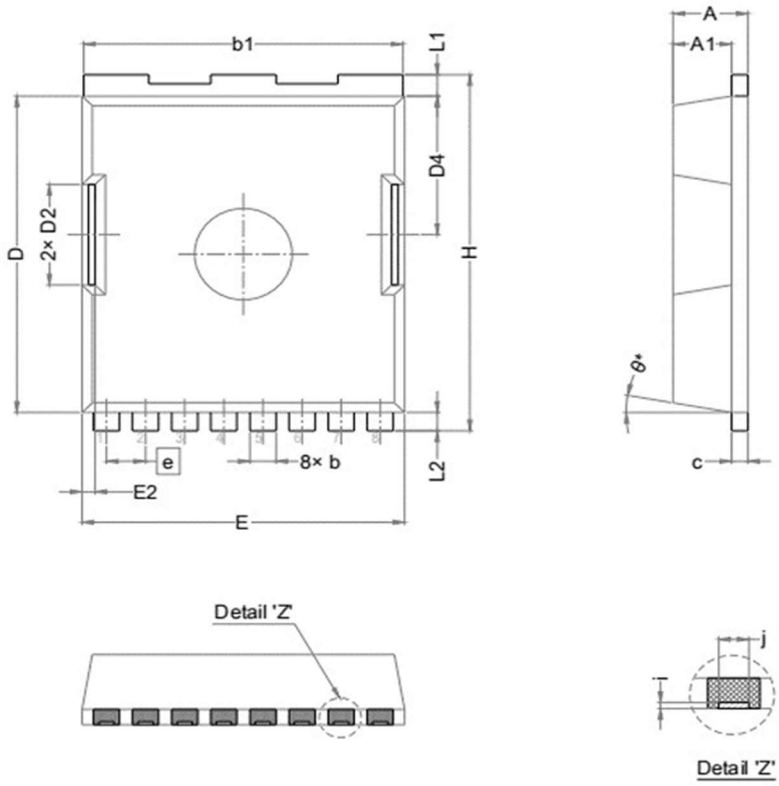
●Fig.14 Normalized total power dissipation as a function of case temperature; Calculative values Normalized Power Dissipation =P_d/P_d(25℃)

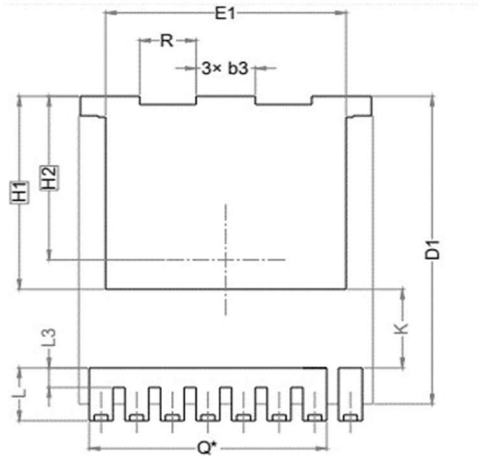


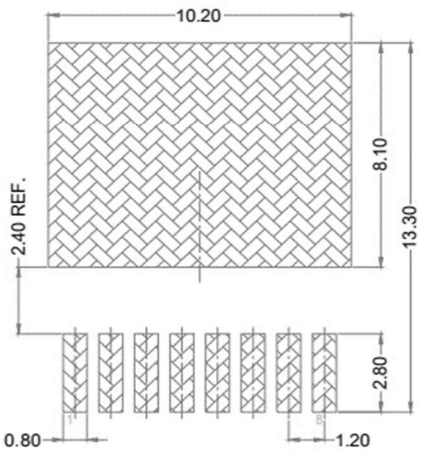
●Fig.15 Transient thermal impedance from junction to case as a function of pulse duration; max values



Package Outline







SYMBOL	DIMENSIONS		
	MIN.	NOM.	MAX.
A	2.20	2.30	2.40
A1	1.70	1.80	1.90
b	0.70	0.80	0.90
b1	9.70	9.80	9.90
b3	1.90	2.00	2.10
c	0.40	0.50	0.60
D	10.28	10.38	10.48
D1	10.98	11.08	11.18
D2	3.20	3.30	3.40
D4	4.45	4.55	4.65
E	9.80	9.90	10.00
E1	8.00	8.10	8.20
E2	0.30	0.40	0.50
e	1.20 BSC		
H	11.58	11.68	11.78
H1	6.95 BSC		
H2	5.89 BSC		
i	0.10 REF.		
j	0.46 REF.		
K	2.80 REF.		
L	1.60	1.90	2.10
L1	0.60	0.70	0.80
L2	0.50	0.60	0.70
L3	0.60	0.70	0.80
N	8		
Q	6.80 REF.		
R	1.80	1.90	2.00
θ	10° REF.		

Note

① Pulse : V_{GS}=+20V/-20V, Duty cycle=50%,T_j=175℃, t=1000 hours; For DC， the following test conditions can be passed: V_{GS}=+20V/-10V, T_j=175℃, t=1000 hours;

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

③Practically the current will be limited by PCB, thermal design and operating temperature. V_{GS}=10V.

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●Revision History

Version	Date	Change
A	2021/9/6	New
B	2022/9/5	1.Add Reach, HF figure 2.ID modify
C	2025/7/4	1.Update Cg condition and curve 2.Add VFSD typical value
D	2026/8/6	Apply new datasheet format
		.