●General Description

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

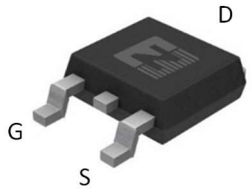
●Features

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

●Application

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

●Product Summary



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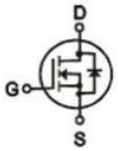


V_{DS}=30V

$R_{DS(ON)}$ =8.6mR

I_D=47A

RoHS REACH COMPLIANT HF

●Ordering Information

Part NO.	ZMS065N03DVC
Marking	ZMS065N03
Packing information	REEL TAPE
Basic ordering unit (pcs)	2500

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

Parameter	Symbol	Conditions	Min.	Max.	Unit
Drain-source voltage	V_{DS}		-	30	V
Gate-source voltage	V_{GS}		-20	20	V
Continuous drain current	I_D	V_{GS}=10V, T_C=25℃	-	47	A
	I_D	V_{GS}=10V, T_C=75℃	-	39	A
	I_D	V_{GS}=10V, T_C=100℃	-	33	A
Pulsed drain current	I_{DM}	Pulsed; t_p ≤ 10 μs; T_C = 25 °C;	-	188	A
Diode continuous current	I_S	V_{GS}=0V, T_C=25℃	-	32	A
Diode pulse current	$I_{S,pulse}$	V_{GS}=0V, Pulsed, t_p ≤ 10 μs, T_C = 25 °C	-	128	A
Total power dissipation	P_D	T_C=25℃	-	41	W
Total power dissipation	P_D	T_A=25℃	-	2.4	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,	-	18	mJ
		L=0.5mH, V_{GS}=10V, R_g=25Ω,	-	32	mJ

ESD level (HBM)		CLASS 1B

● Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	3.7	°C/W
Thermal resistance, junction - ambient	R_{thJA} ①	-	-	62	°C/W
Soldering temperature	T_{sold}	-	-	260	°C

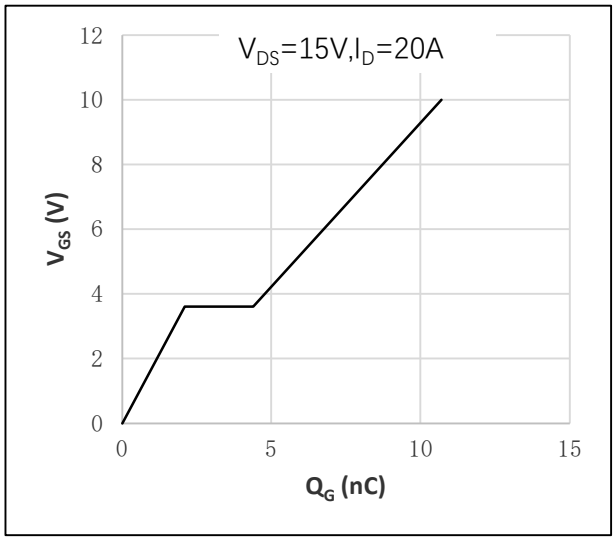
● Electronic Characteristics (T_j=25°C, unless otherwise specified)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	V_{GS} =0V, I_D =250uA	30	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250uA	1.2	1.8	2.5	V
Drain-source leakage current	I_{DSS}	V_{GS}=0V, V_{DS}=30V	-	-	1	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=20A, T_j=25℃	-	8.6	10.3	mΩ
		V_{GS}=4.5V, I_D=20A, T_j=25℃	-	11.9	14.3	mΩ
		V_{GS}=10V, I_D=20A, T_j=175℃	-	15	-	mΩ
Forward transconductance	g_{FS}	V_{DS} =5V, I_{SD} = 10A	-	27	-	S
Diode forward voltage	V_{FSD}	V_{GS} =0V, I_{SD} = 20A	-	0.9	1.3	V

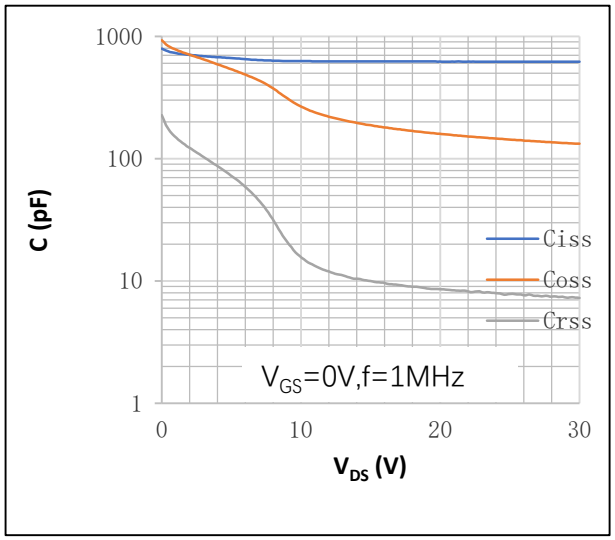
● Dynamic characteristics (T_j=25°C, unless otherwise specified)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	f = 1MHz, V_{DS}=15V, V_{GS}=0V	-	625	-	pF
Output capacitance	C_{oss}		-	188	-	pF
Reverse transfer capacitance	C_{rss}		-	10	-	pF
Gate resistance	R_g	f = 1MHz	-	4.5	-	Ω
Total gate charge	Q_g	V_{DD} = 15V, I_D = 20A, V_{GS} = 10V	-	10.7	-	nC
Total gate charge(4.5V)	Q_g(4.5V)		-		-	nC
Gate-source charge	Q_{gs}		-	2.1	-	nC
Gate-drain charge	Q_{gd}		-	2.3	-	nC
Turn-on delay time	$t_{D(on)}$	V_{GS}=10V, V_{DS}=15V, R_G =3.3Ω, I_D =20A	-	5	-	ns
Turn-on rise time	t_r		-	5	-	ns
Turn-off delay time	$t_{D(off)}$		-	18	-	ns
Turn-off fall time	t_f		-	3	-	ns
Reverse recovery time	t_{rr}	V_{DD}=20V, dIs/dt = 100A/us, I_S=20A	-	18	-	ns
Reverse recovery charge	Q_{rr}		-	15	-	nC

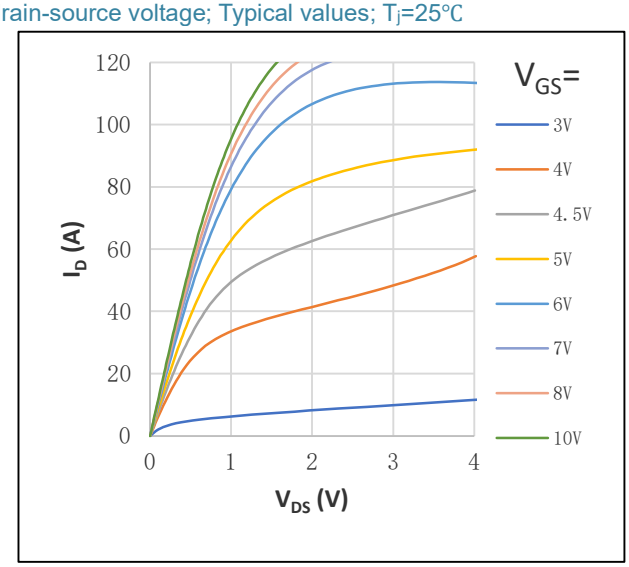
●Fig.1 Gate-source voltage as a function of gate charge; Typical values; T_j=25℃



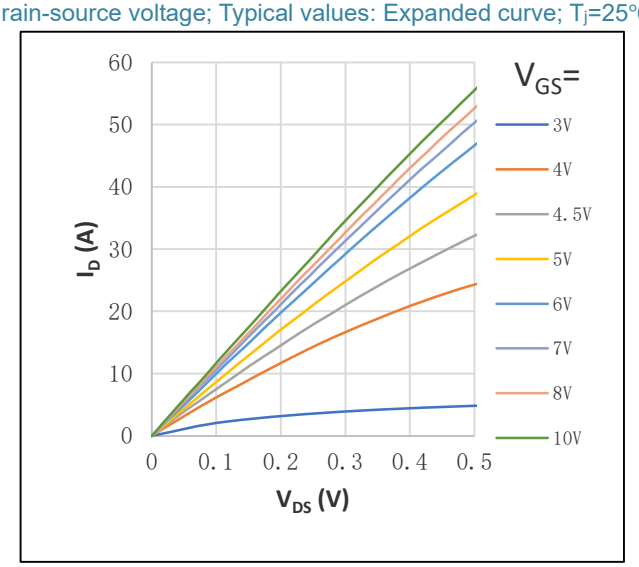
●Fig.2 Input, output and reverse transfer capacitances as a function of drain-source voltage; Typical values; T_j=25℃



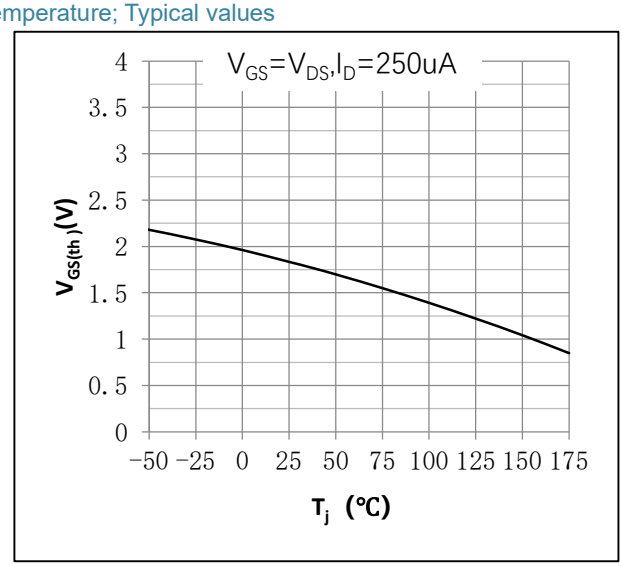
●Fig.3 Output characteristics: drain current as a function of drain-source voltage; Typical values; T_j=25℃



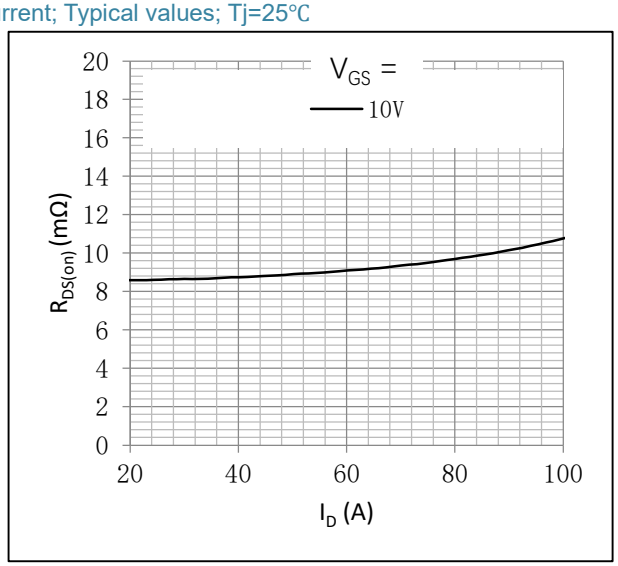
●Fig.4 Output characteristics: drain current as a function of drain-source voltage; Typical values: Expanded curve; T_j=25℃



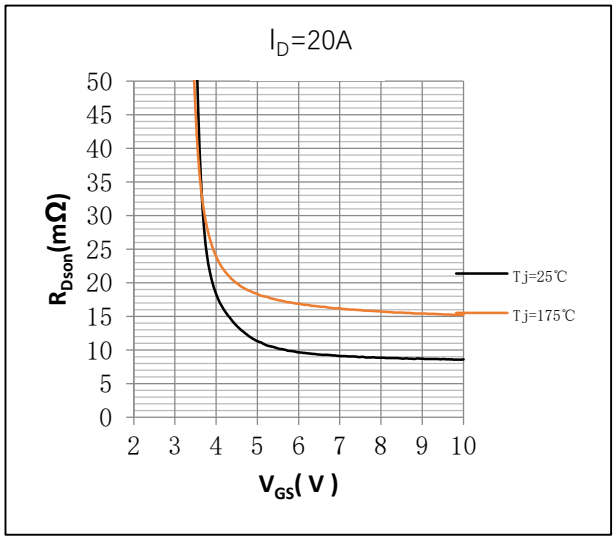
●Fig.5 Gate-source threshold voltage as a function of junction temperature; Typical values



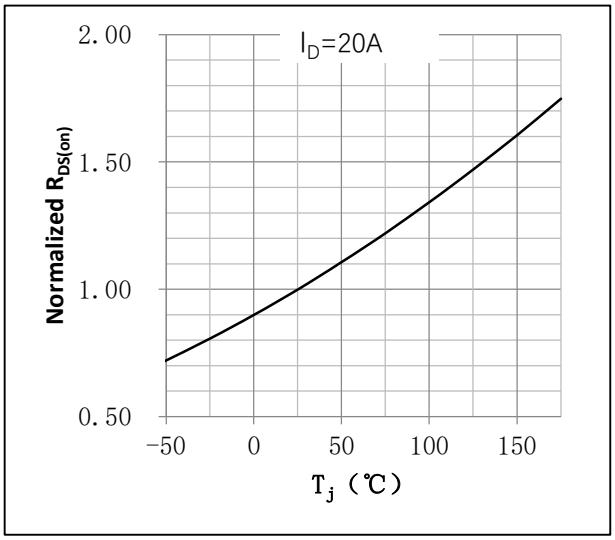
●Fig.6 Drain-source on-state resistance as a function of drain current; Typical values; Tj=25℃



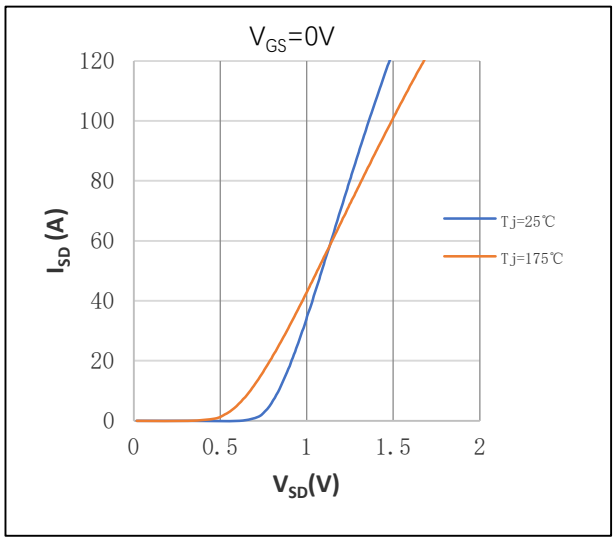
●Fig.7 Drain-source on-state resistance as a function of gate-source voltage; Typical values



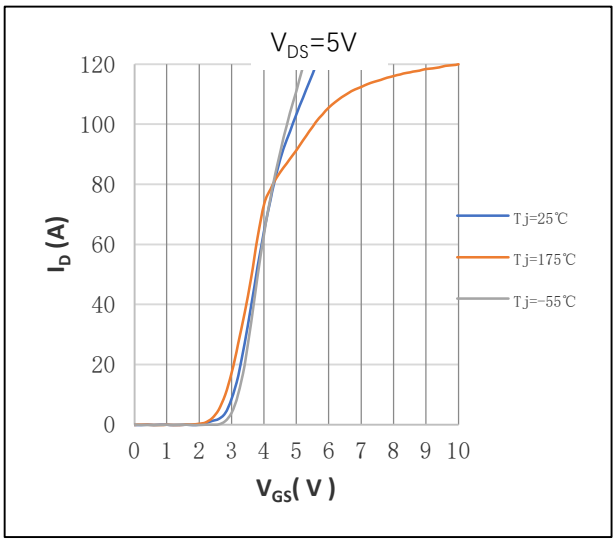
●Fig.8 Normalized drain-source on-state resistance factor as a function of junction temperature; Typical values Normalized On-Resistance=R_{DSon}/R_{DSon}(25℃)



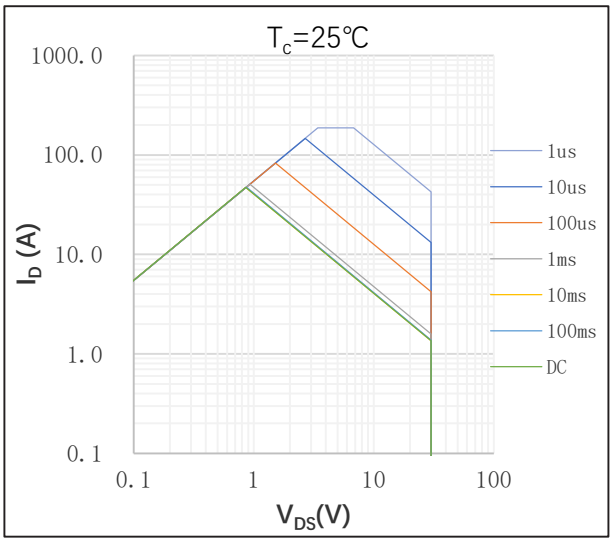
●Figure 9. Source (diode forward) current as a function of source-drain (diode forward) voltage; Typical values



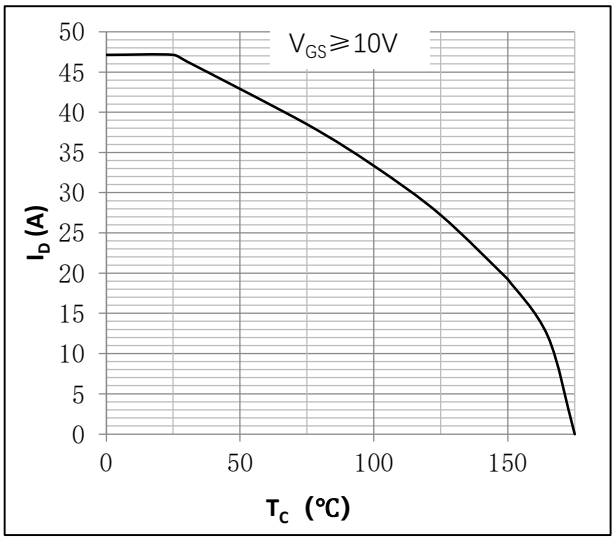
●Figure 10. Transfer characteristics: drain current as a function of gate-source voltage; Typical values



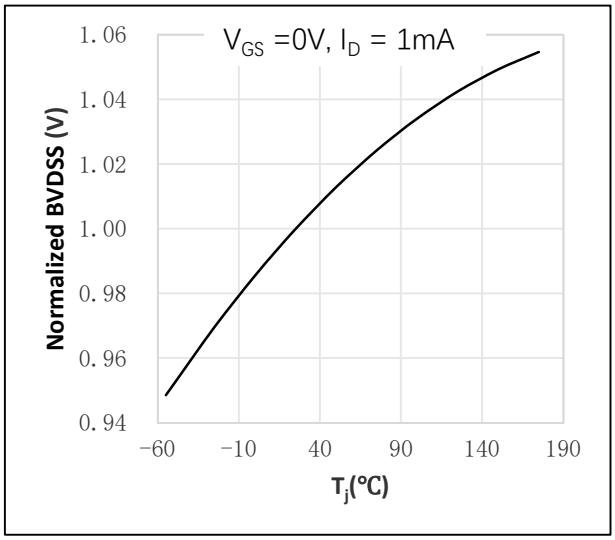
●Fig.11 Safe operating area: continuous and peak drain currents as a function of drain-source voltage; Calculative values



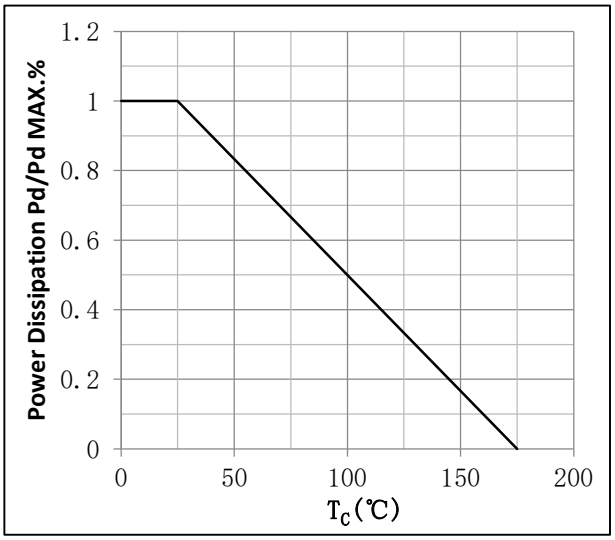
●Fig.12 Continuous drain current as a function of case temperature[2];Calculative values



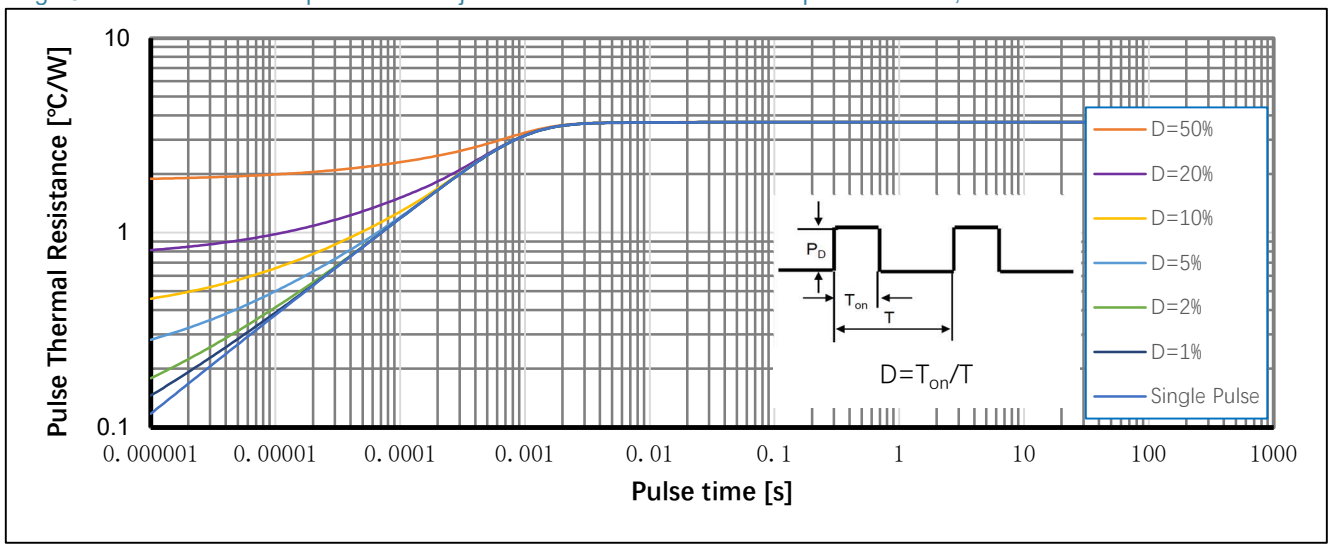
●Fig.13 Drain-source breakdown voltage as a function of junction temperature; Typical values Normalized BV_{DSS} =$BV_{DSS}/BV_{DSS}(25℃)$



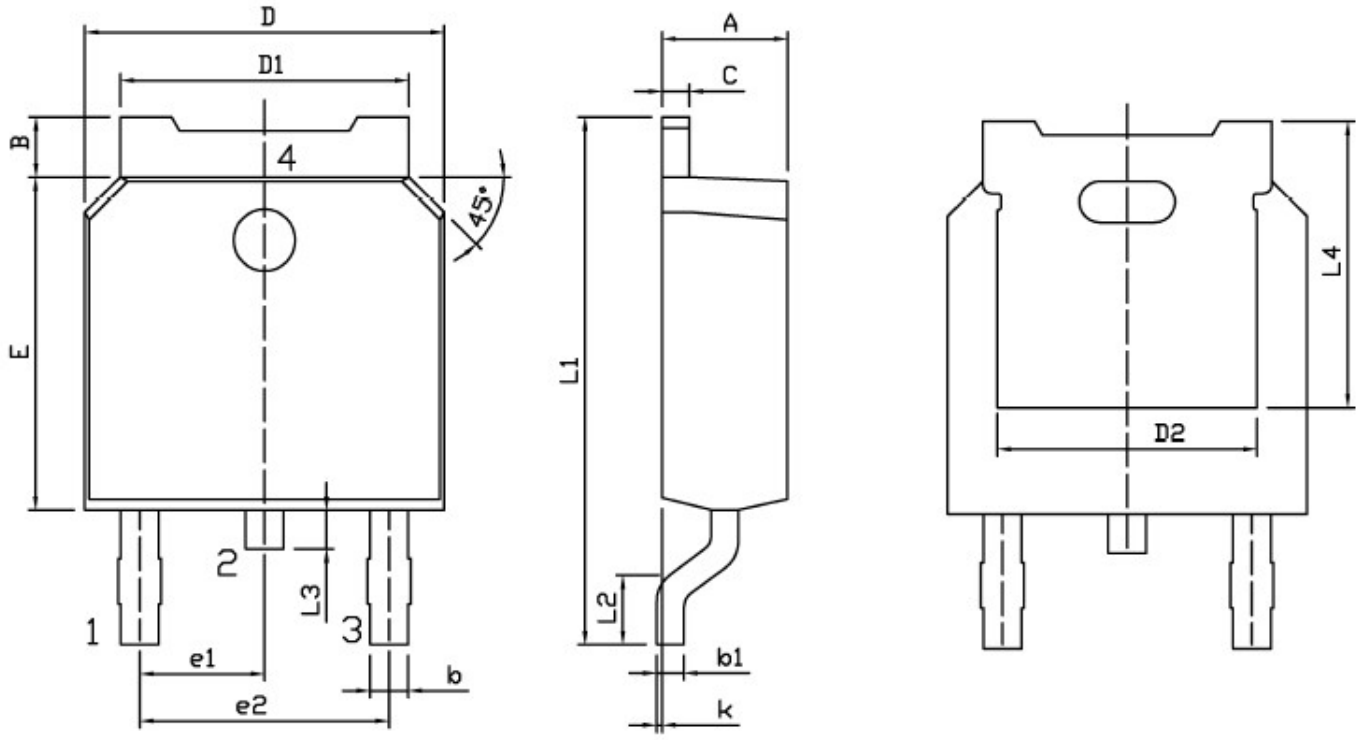
●Fig.14 Normalized total power dissipation as a function of case temperature; Calculative values Normalized Power Dissipation =$P_d/P_d(25℃)$



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



Package Outline



Dimensions In Millimeters					
Symbol	MIN	MAX	Symbol	MIN	MAX
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.70	0.90	e2	4.43	4.73
b1	0.45	0.55	L1	9.85	10.35
C	0.45	0.55	L2	1.70	2.00
D	6.45	6.75	L3	0.60	0.90
D1	5.10	5.50	L4	5.05	
D2	4.85		k	0.00	0.10

●Note

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

②Practically 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	2025/11/11	New