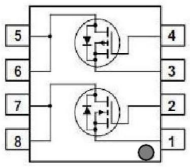
• General Description

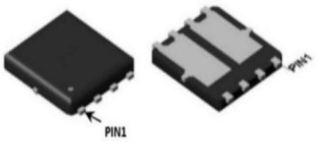
It combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. It combines one N channel MOSFET and one P channel MOSFET.

• Product Summary



V_{DS1} =60V
V_{DS2} =-60V
$R_{DS(ON)1}$ =35mΩ
$R_{DS(ON)2}$ =28mΩ
I_{D1} =20A
I_{D2} =-10A

RoHS



DFN3*3

• Features

- ■ Advance high cell density Trench technology
- ■Low $R_{DS(ON)}$ to minimize conductive loss
- ■Low Gate Charge for fast switching
- ■ Dual DIE in one package

•Application

- ■ Power Management in Notebook Computer
- ■ BLDC Motor driver

•Ordering Information:

Part NO.	CH20NP06SN
Marking	CH20NP06SN
Packing Information	REEL TAPE
Basic ordering unit (pcs)	5000

• Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	3.3	° C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	62	° C/W
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	265	° C

• N Channel Absolute Maximum Ratings (T_C =25℃)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D@T_C =25℃	20	A
	I_D@T_C =75℃	16	A
	I_D@T_C=100℃	14	A

Pulsed Drain Current ①	I_{DM}	60	A
Total Power Dissipation	P_D@T_C=25℃	25	W
Total Power Dissipation	P_D@T_A=25℃	2.0	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy	E_{AS}	72	mJ

• P Channel Absolute Maximum Ratings (T_C =25℃)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D@T_C =25℃	-10	A
Continuous Drain Current	I_D@T_C=100℃	-6.3	A
Pulsed Drain Current ①	I_{DM}	-32	A
Total Power Dissipation	P_D@T_A=25℃	3.0	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy	E_{AS}	60	mJ

• N Channel Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D =250uA	60			V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} =V_{DS}, I_D =250uA	1.2	1.6	2.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V, V_{GS} =0V			1.0	uA
Gate- Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS} =0V			±100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	VGS=10V, ID=20A		24	35	mΩ
		VGS=4.5V, ID=10A		30	40	mΩ
Forward Trans conductance	g_{FS}	V_{DS} =25V, I_D=30 A	11			s
Source-drain voltage	V_{SD}	Is=20A			1.20	V

• Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	f = 1MHz	-	590	-	pF
Output capacitance	Coss		-	70	-	

Reverse transfer capacitance	Crss	V_{DS}=25V	-	64	-	
Total gate charge	Qg	V_{DD} = 25V	-	25.3	-	nC
Gate - Source charge	Qgs	I_D = 5A	-	4.7	-	
Gate - Drain charge	Qgd	V_{GS} = 10V	-	6.1	-	

• P Channel Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D =-250uA	-60			V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} =V_{DS}, I_D =-250uA	-1.3	-1.8	-2.3	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-60V, V_{GS} =0V			-1.0	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=-5A		60	76	mΩ
		V_{GS}=-4.5V, I_D=-4A		75	115	mΩ
Forward Transconductance	g_{FS}	V_{DS} =-10V, I_D=-5A		7		s

• Dynamic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss	f = 1MHz	-	525	-	pF
Output capacitance	Coss	V_{DS}=-25V	-	80	-	
Reverse transfer capacitance	Crss		-	3.9	-	
Total gate charge	Qg	V_{DD} = -15V	-	8.5	-	nC
Gate - Source charge	Qgs	I_D = -4A	-	1.8	-	
Gate - Drain charge	Qgd	V_{GS} = -10V	-	1.5	-	

Typical Electrical and Thermal Characteristics (Curves)

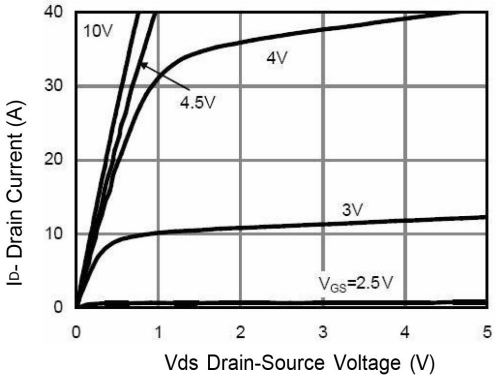


Figure 1 Output Characteristics

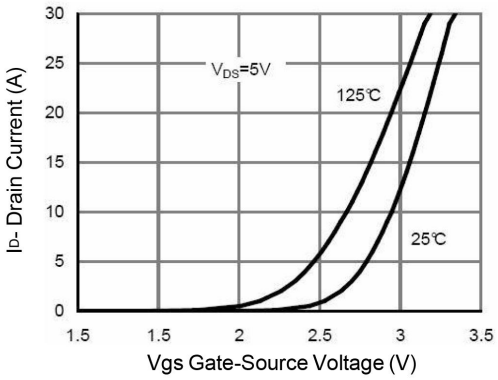


Figure 2 Transfer Characteristics

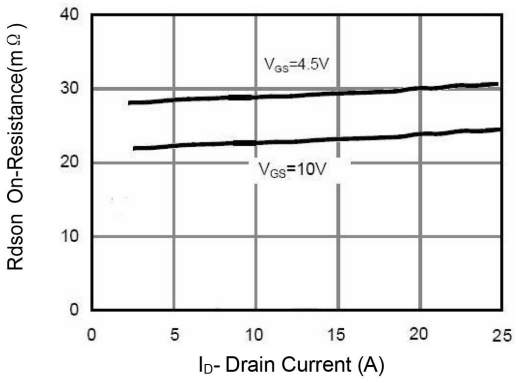


Figure 3 Rdson- Drain Current

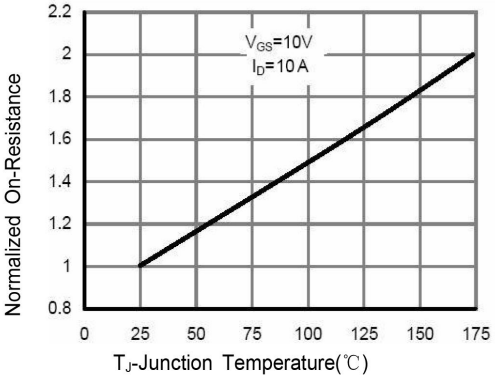


Figure 4 Rdson-Junction Temperature

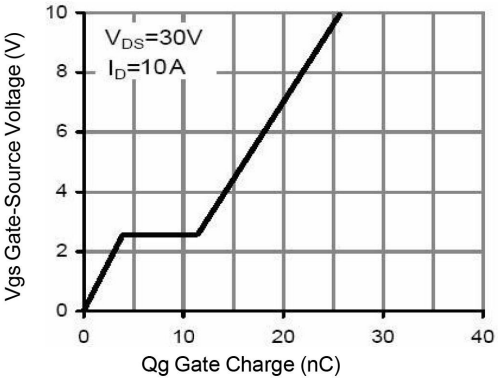


Figure 5 Gate Charge

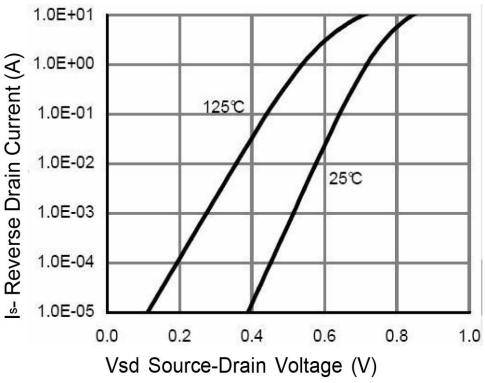


Figure 6 Source- Drain Diode Forward

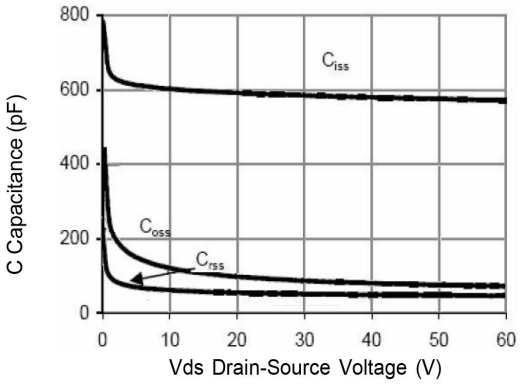


Figure 7 Capacitance vs Vds

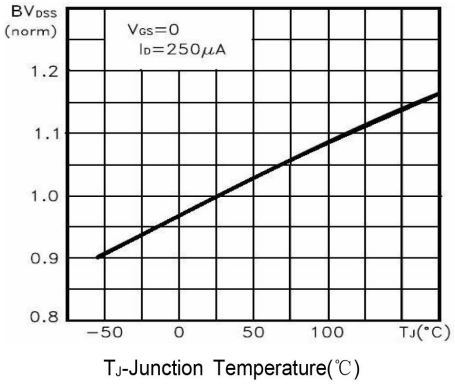


Figure 9 BV_{DSS} vs Junction Temperature

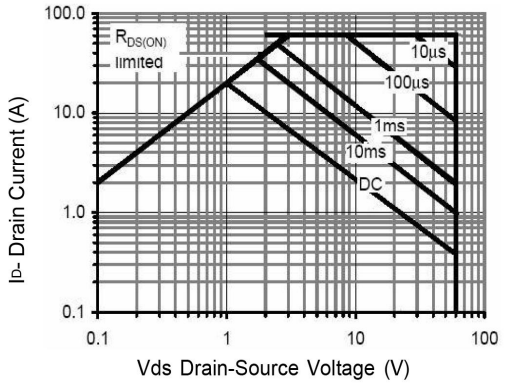


Figure 8 Safe Operation Area

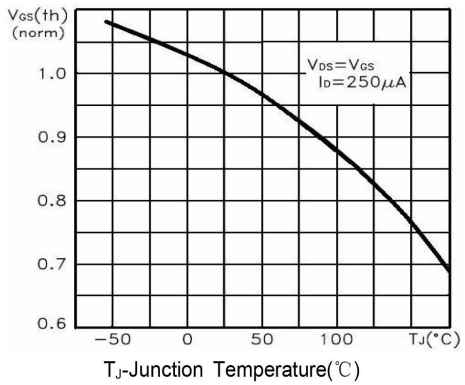


Figure 10 $V_{GS(th)}$ vs Junction Temperature

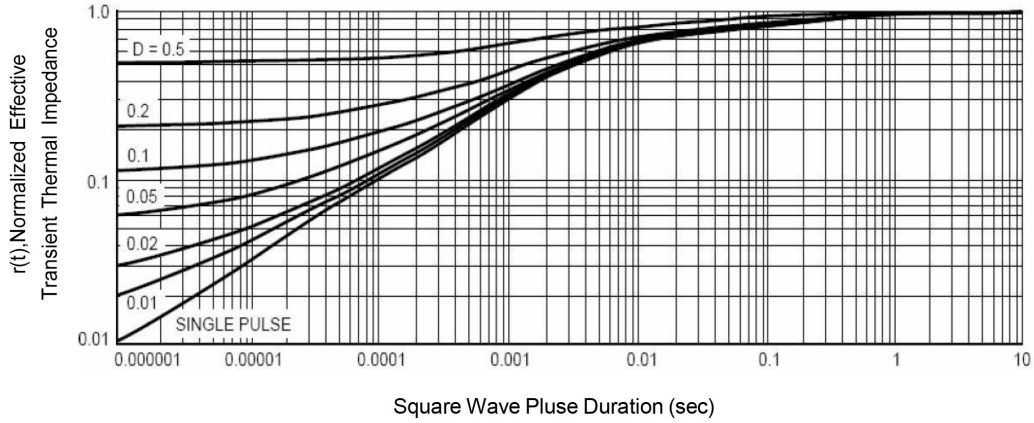
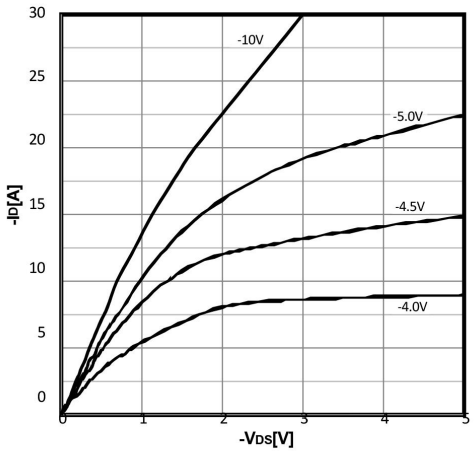


Figure 11 Normalized Maximum Transient Thermal Impedance

• P Channel characteristics curve

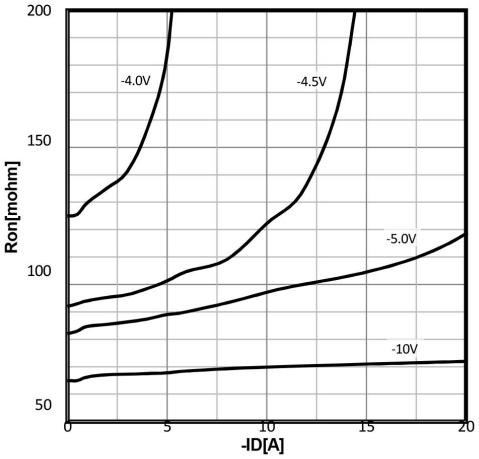
Typ. output characteristics

$-I_D=f(-V_{DS})$



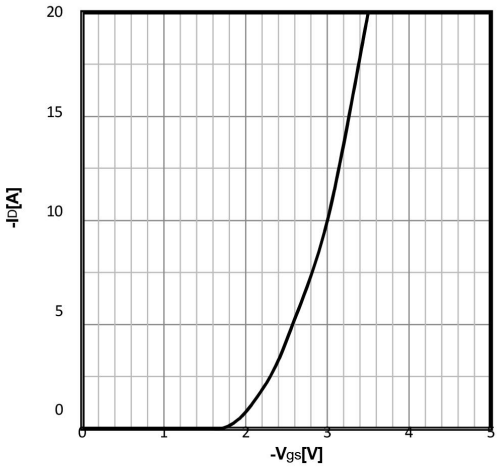
Typ. drain-source on resistance

$R_{DS(on)}=f(-I_D)$



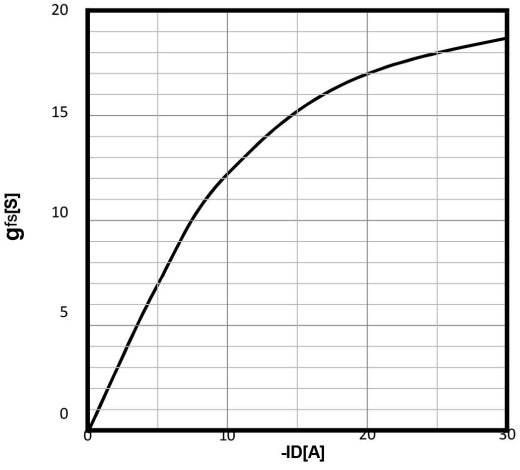
Typ. transfer characteristics

$-I_D=f(-V_{GS})$



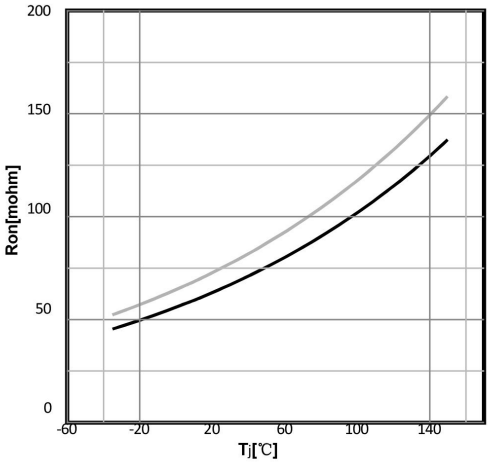
Typ. forward transconductance

$g_{fs}=f(-I_D)$



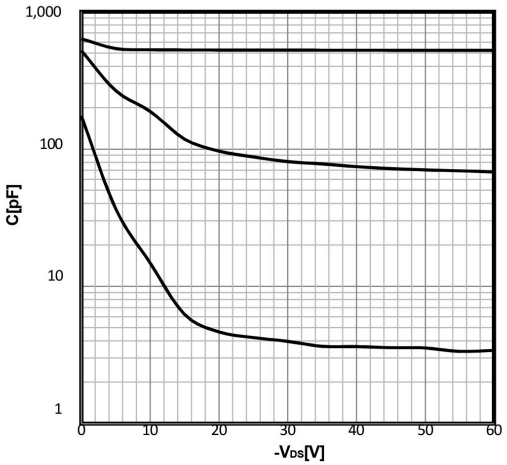
Drain-source on-state resistance

$R_{DS(on)}=f(T_j)$; I_D=-5.0A; V_{GS}=-10V



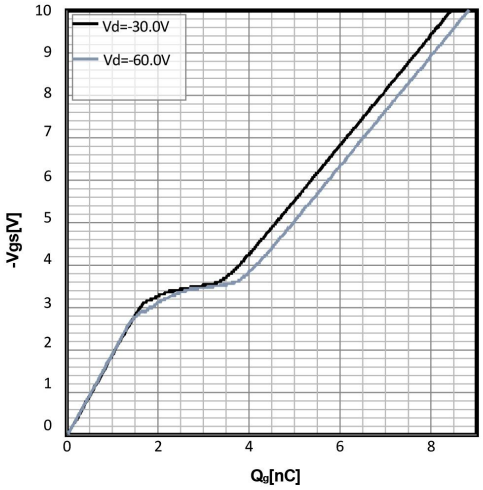
Typ. capacitances

C =f(-V_{DS}); V_{GS}=0V; f =1MHz



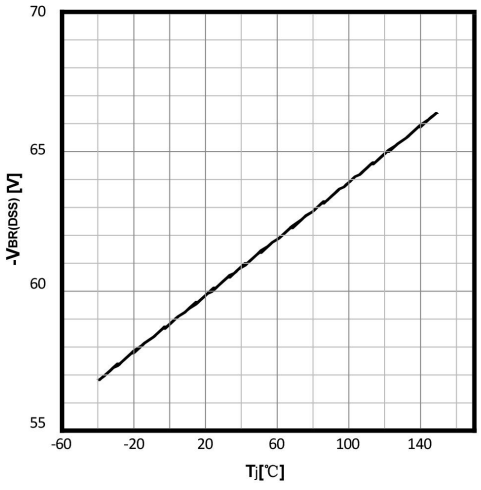
Typ. gate charge

-V_{GS}=f(Q_{gate}) ; I_D=-5A



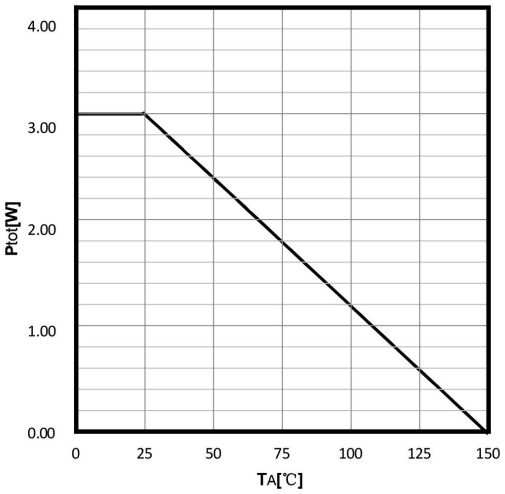
Drain-source breakdown voltage

-$V_{BR(DSS)}$=f(T_j); I_D=-250uA



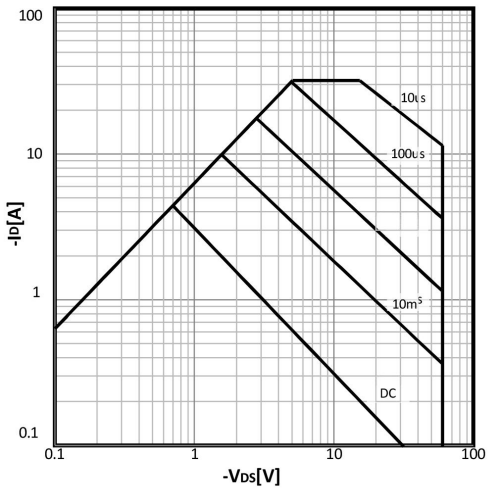
Power Dissipation

$P_{tot}=f(T_A)$



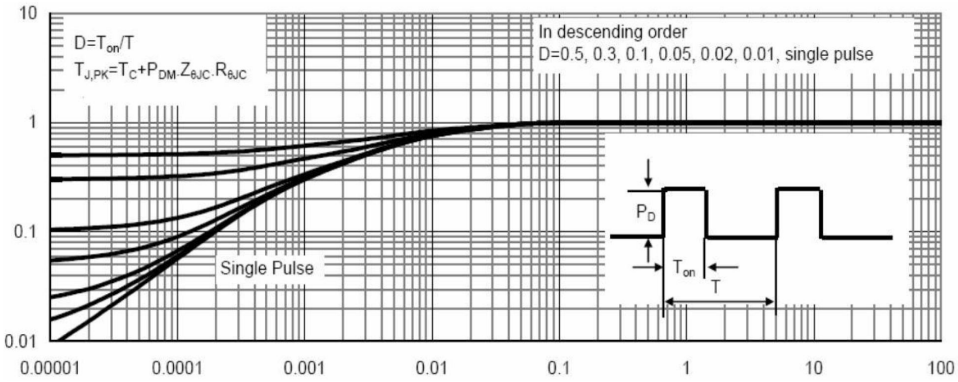
Safe operating area

$-I_D=f(-V_{DS})$



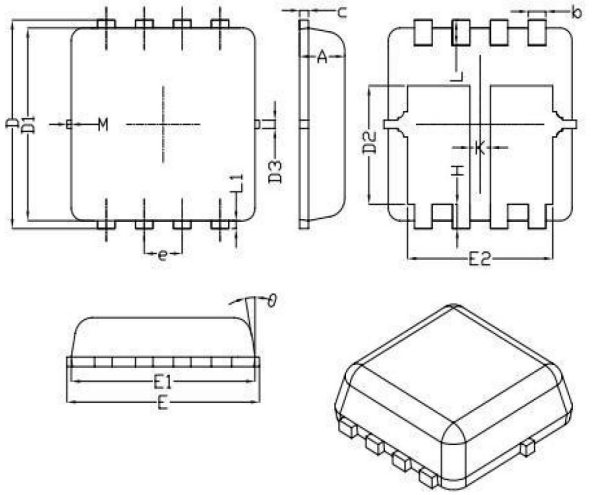
Max. transient thermal impedance

$Z_{thJC}=f(t_p)$



• Dimensions（DFN3×3）

Unit：mm



SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	---	0.13	---
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	---	0.13	---
K	0.30	---	---
θ	---	10°	12°
M	*	*	0.15
* Not specified			