

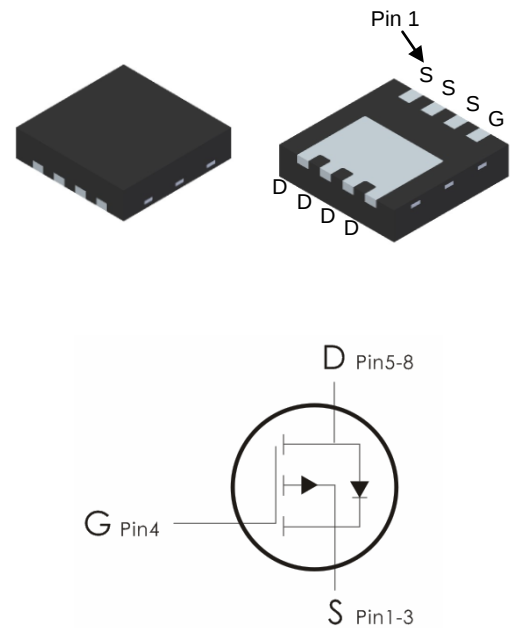
Description:

This P-Channel MOSFET uses advanced SGT technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=-60V, I_D=-45A, R_{DS(on)} < 15m\Omega @ V_{GS}=-10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
DOY45P06T	45P06T	TDFN3333-8	5000 pcs/Reel

Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	-45	A
	Continuous Drain Current- $T_C=100^\circ C$	-30	
I_{DM}	Pulsed Drain Current ¹	-195	
P_D	Power Dissipation	80	W
E_{AS}	Single pulse avalanche energy ²	298	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55--+150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.56	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	60	$^\circ C/W$

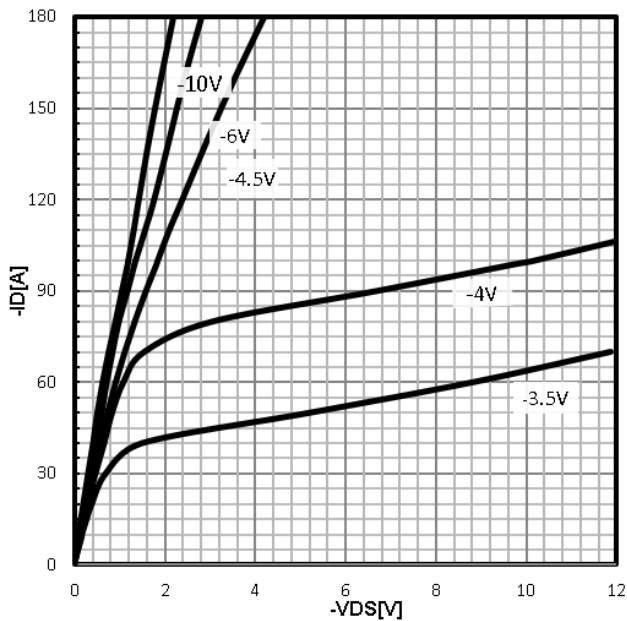
Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	-60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-60V	---	---	-1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	-1.3	-1.8	-2.3	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =-10V, I _D =-20A	---	12	15	m Ω
		V _{GS} =-4.5V, I _D =-10A	---	16	20	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-30V, V _{GS} =0V, f=1MHz	---	2498	---	pF
C _{oss}	Output Capacitance		---	459	--	
C _{rss}	Reverse Transfer Capacitance		---	9.87	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =-30V, I _D =-10A, R _G =3 Ω, V _{GS} =-10V	---	21	---	ns
t _r	Rise Time		---	26.25	---	ns
t _{d(off)}	Turn-Off Delay Time		---	63	---	ns
t _f	Fall Time		---	31.5	---	ns
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-30V, I _D =-10A	---	39.9	---	nc
Q _{gs}	Gate-Source Charge		---	7.2	---	nc
Q _{gd}	Gate-Drain “Miller” Charge		---	5.2	---	nc
Drain-Source Diode Characteristics						
I _S	Continuous Drain Curren	VD=VG=0V	---	---	-45	A
I _{SM}	Pulsed Drain Current		---	---	-195	A
T _{rr}	Reverse Recovery Time	I _F =10A, T _J =25, dI/dt=100A/us	---	50	---	ns
Q _{rr}	Reverse Recovery Charge		---	80	---	nc
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =-5A	---	---	-1.2	V

Notes:

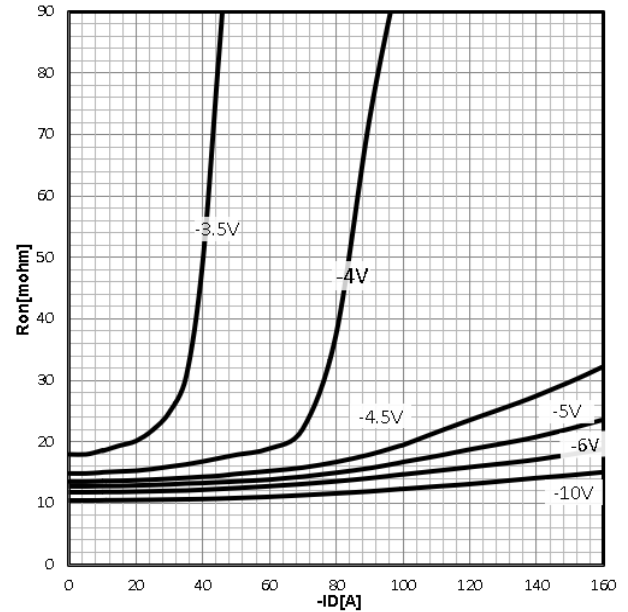
- 1.Repetitive rating; pulse width limited by maximum junction temperature
2. $V_{DD} = -30V$, $L = 1.0mH$, $R_G = 25\Omega$, Starting $T_j = 25^\circ C$

Typical Characteristics: ($T_c = 25^\circ C$ unless otherwise noted)



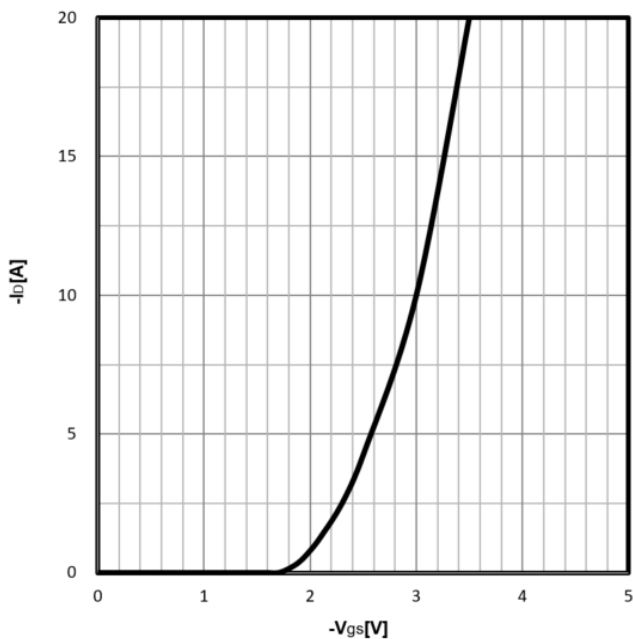
$$I_D = f(V_{GS})$$

Fig1. Typ. output characteristics



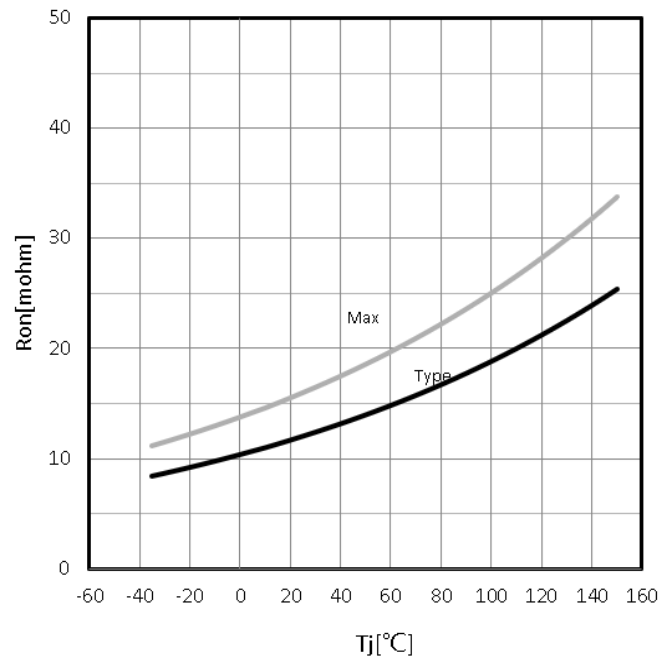
$$R_{DS(on)} = f(-I_D)$$

Fig2. Typ. drain-source on resistance



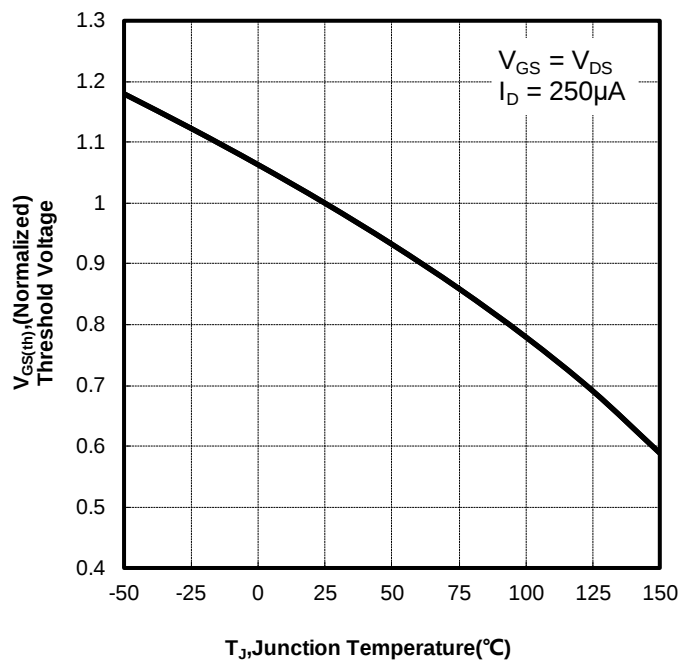
$$-I_D = f(-V_{GS})$$

Fig3. Typ. transfer characteristics

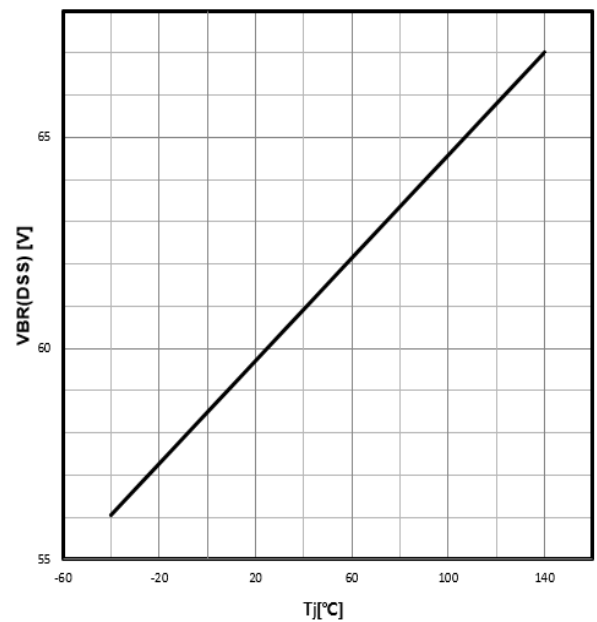


$$R_{DS(on)} = f(T_j); I_D = -20A; V_{GS} = -10V$$

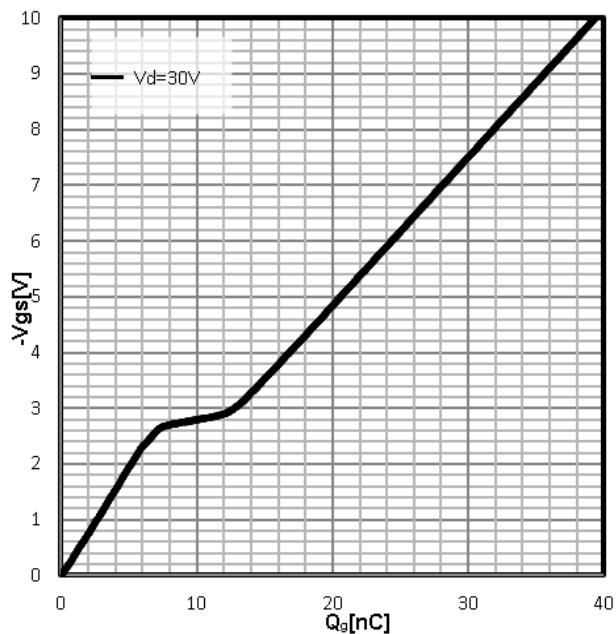
Fig4. Drain-source on-state resistance



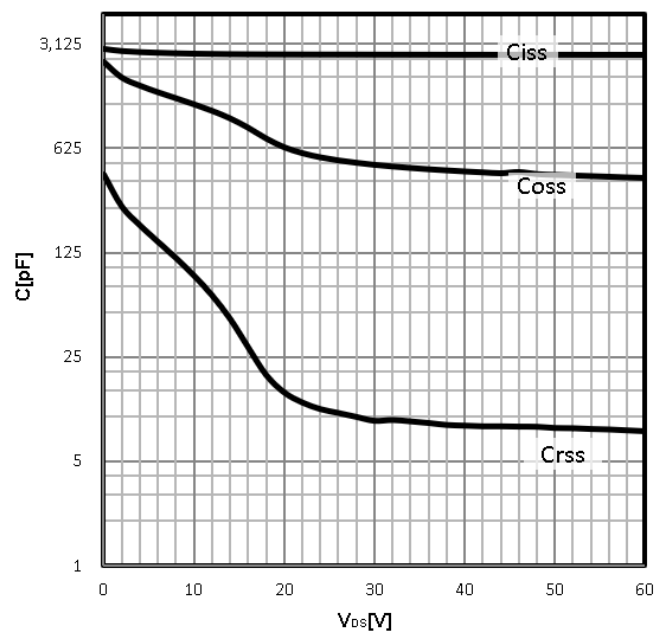
$-V_{TH}=f(T_j)$; $I_D=-250\mu A$
Fig5. Gate Threshold Voltage



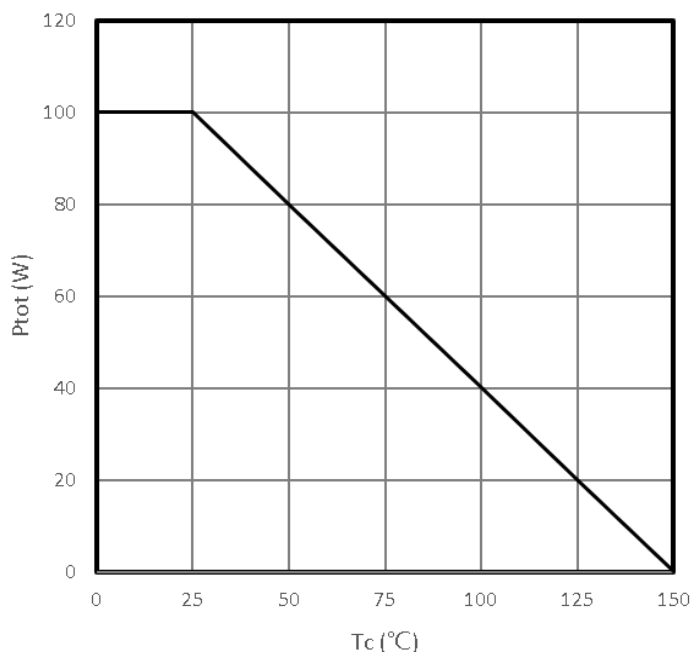
$-V_{BR(DSS)}=f(T_j)$; $I_D=-250\mu A$
Fig6. Drain-source breakdown voltage



$V_{GS}=f(Q_{gate})$; $I_D=-10A$
Fig7. Typ. gate charge

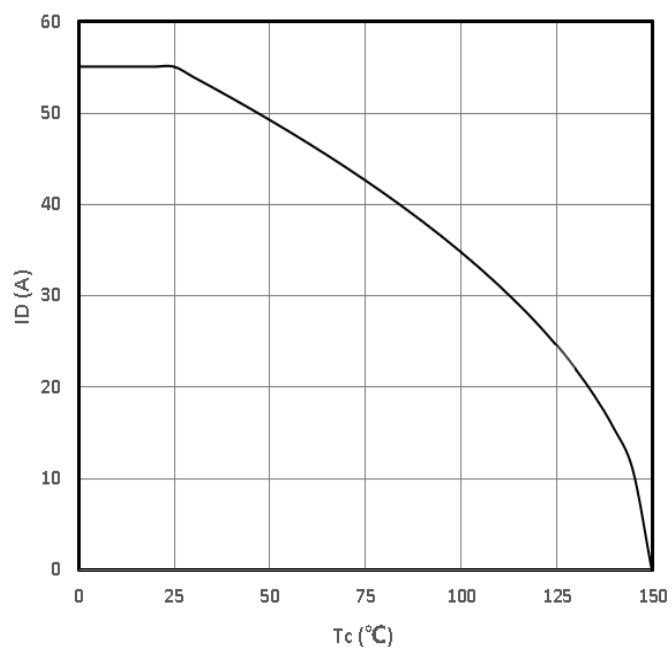


$C=f(-V_{DS})$; $V_{GS}=0V$; $f=1MHz$
Fig8. Typ. Capacitances



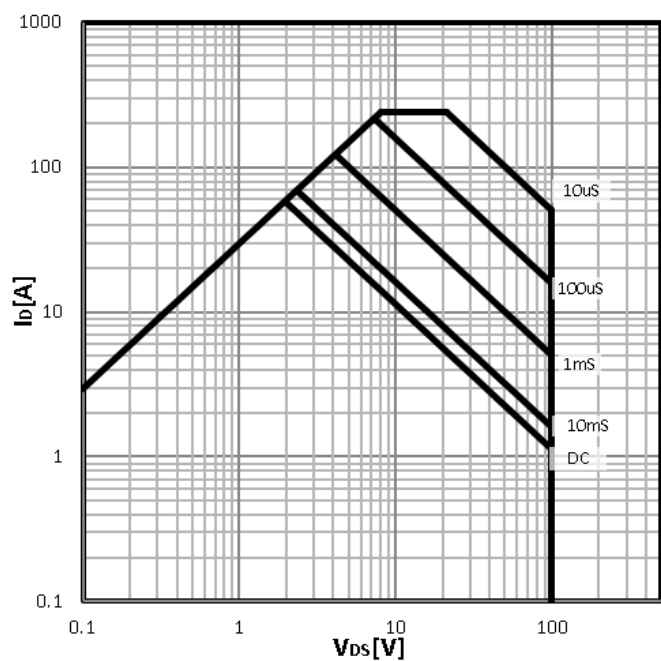
$$P_{tot}=f(T_c)$$

Fig9. Power Dissipation



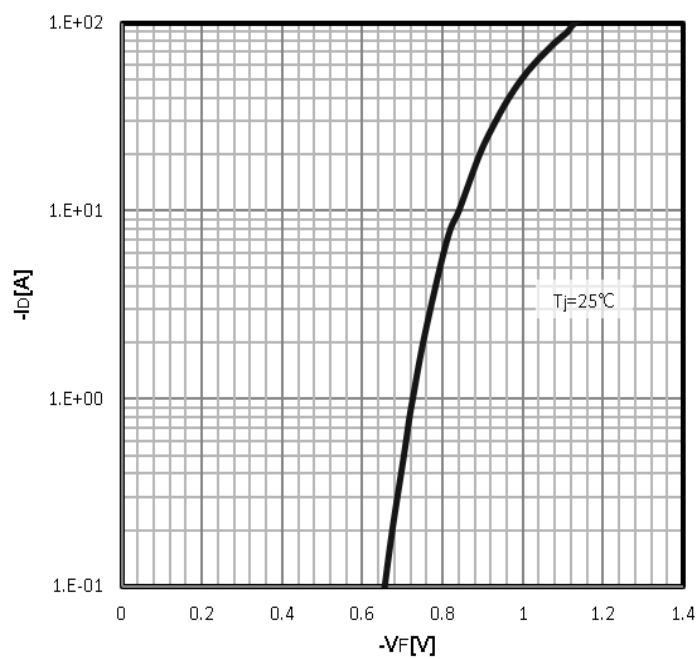
$$-I_D=f(T_c)$$

Fig10. Maximum Drain Current



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

Fig11. Safe operating area



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

Fig12. Body Diode Forward Voltage Variation

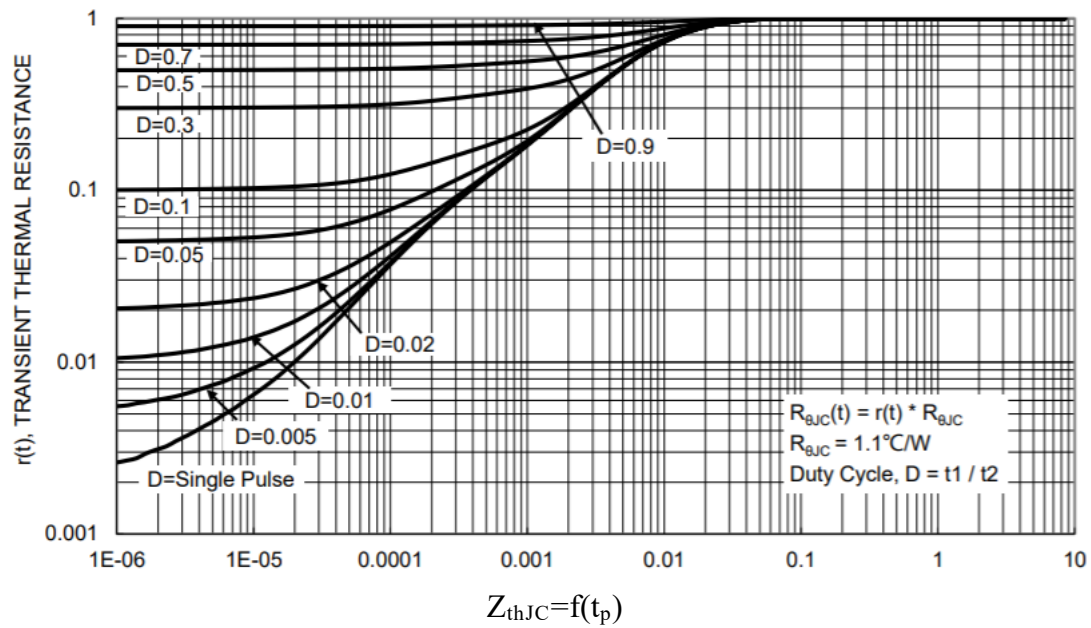
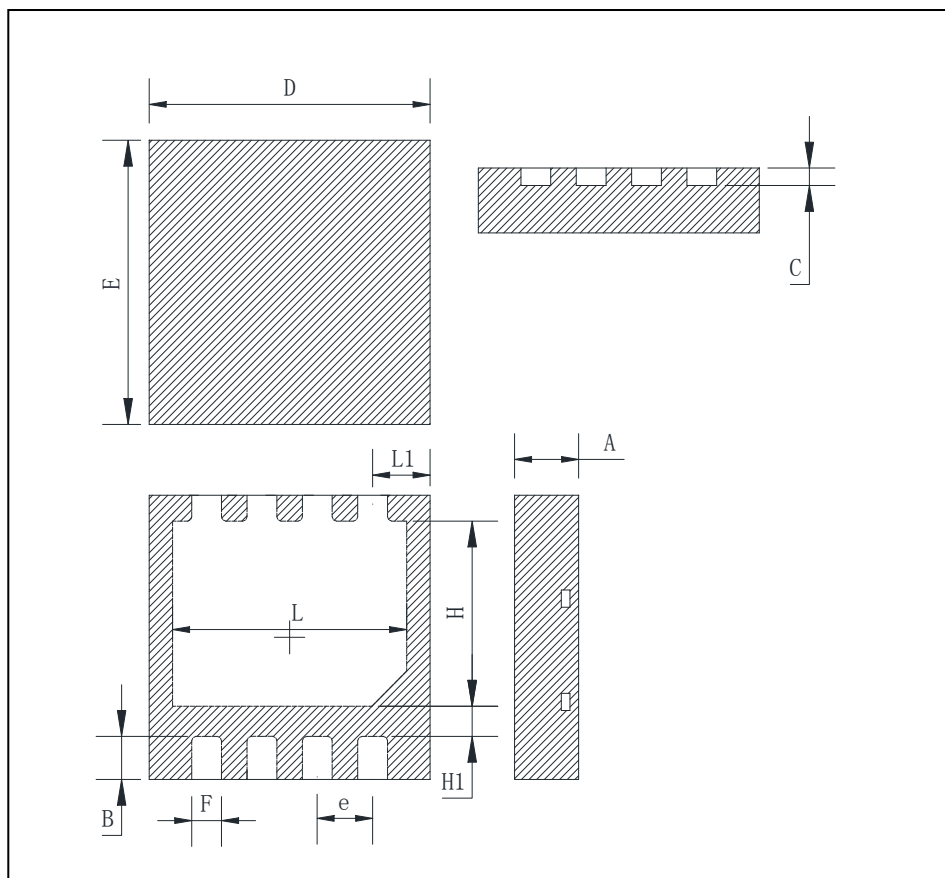


Fig13. Max. transient thermal impedance

TDFN3333-8 Package Information:



Symbol	Min	Typ	Max
A	0.70	0.75	0.80
B	0.40	0.50	0.60
C	0.153	0.203	0.253
D	3.20	3.30	3.40
E	3.20	3.30	3.40
e	0.60	0.65	0.70
F	0.30	0.35	0.40
H	2.05	2.15	2.25
H1	0.25	0.35	0.45
L	2.65	2.75	2.85
L1	0.575	0.675	0.775

Marking Information:

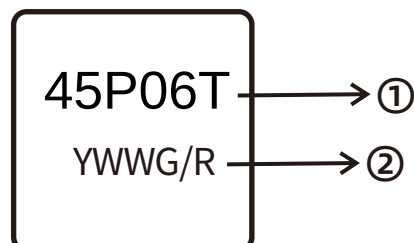
①. Part NO.

②. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

G/R : G(Green) /R(Lead Free)



Previous Version

Version	Date	Subjects (major changes since last revision)
1.0	2024-02-11	Release of final version

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