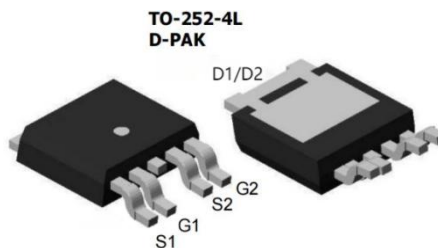




Product Summary

$V_{(BR)DSS}$		$R_{DS(ON)} \max$	$I_D \max$
N-MOS	40V	$<25m\Omega @V_{GS}=10V$	28A
		$<29m\Omega @V_{GS}=4.5V$	
P-MOS	-40V	$<40m\Omega @V_{GS}= -10V$	-26A
		$<55m\Omega @V_{GS}= -4.5V$	

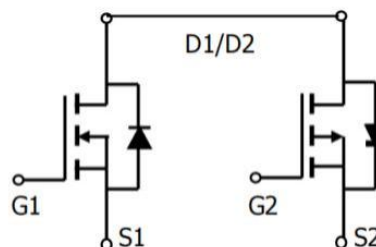
Package & Internal Circuit



Description and Applications

The CFD609A uses trench power MOS technology to provide excellent $R_{DS(ON)}$ and low gate charge. The complementary MOSFETs may be used in H-bridge, inverters and other applications.

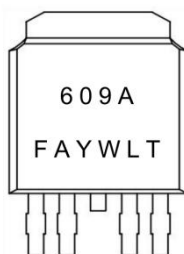
RoHS and Halogen-Free Compliant.



Ordering Information

Part Number	Package Type	Package Qty
CFD609A	TO 252-4L	2,500/Tape&Reel

Marking Information



Green product

609A--Part Number
F--Fab location
A--Assembly location
Y--Year
W--Week
LT--Lot sequence

Absolute Maximum Rating ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	N-MOS	P-MOS	Units
Drain-Source Voltage		V_{DS}	40	-40	V
Gate-Source Voltage		V_{GS}	± 20	± 20	V
Drain Current - Continuous	$T_C = 25^\circ\text{C}$	I_D	28	-26	A
	$T_C = 100^\circ\text{C}$		22	-18.5	A
Pulsed Drain Current		$I_{D,pulse}$	40	-30	A
Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	25	31	W
	$T_C = 100^\circ\text{C}$		10	12.5	W
Single Pulsed Avalanche Energy $L=0.1mH$		E_{AS}	37	49	mJ
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to 150		$^\circ\text{C}$

Parameter		Symbol	N-MOS		P-MOS		Units
			Typ	Max	Typ	Max	
Maximum Junction-to-Ambient	Steady-State	$R_{\theta JA}$	-	62	-	62	°C/W
Maximum Junction-to-Case	Steady-State	$R_{\theta JC}$	-	5	-	4	°C/W

N-MOS Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D = 250μA, V _{GS} =0V	40			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =40V, V _{GS} =0V			1	μA
		T _J =55°C			5	μA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} = ±20V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D = 250μA	1.5	2	2.5	V
R _{DS(ON)}	Drain-Source on-Resistance	V _{GS} = 10V, I _D = 8A		15	20	mΩ
		V _{GS} = 4.5V, I _D = 4A		18	24	mΩ
g _{FS}	Forward Transconductance	V _{DS} =5V,I _D =8A		16		S
R _g	Gate resistance	f=1MHz	0.4	1.4	3.5	Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0V V _{DS} = 20V f=1MHz		978.7		pF
C _{oss}	Output Capacitance			62.2		pF
C _{rss}	Reverse Transfer Capacitance			26.5		pF
Q _g	Total Gate Charge	V _{GS} = 10V V _{DS} = 20V I _D = 8A		16.3		nC
Q _{gs}	Gate Source Charge			3		nC
Q _{gd}	Gate Drain Charge			2.11		nC
t _{D(on)}	Turn-On DelayTime	V _{DD} = 20V V _{GS} = 10V R _L = 1Ω R _G = 3Ω		8		ns
t _r	Turn-On Rise Time			18.4		ns
t _{D(off)}	Turn-Off DelayTime			13.2		ns
t _f	Turn-Off Fall Time			2.8		ns
Drain-Source Body Diode Characteristics						
V _{SD}	Body Diode Forward Voltage	I _S = 1A V _{GS} = 0V		0.73		V
t _{rr}	Body Diode Reverse Recovery Time	I _F = 10A di/dt =100 A/μs		20.1		ns
Q _{rr}	Body Diode Reverse Recovery Charge			10		nC

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

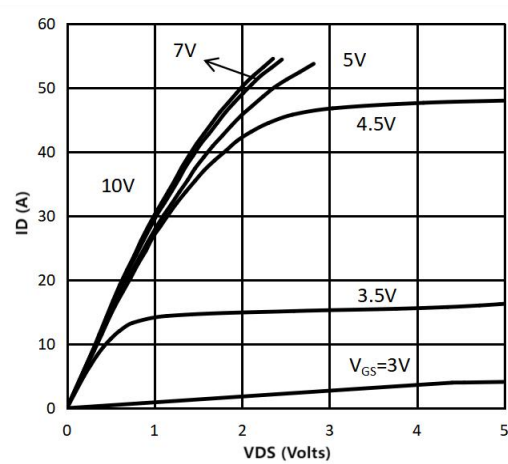


Figure 1: On-Region Characteristics

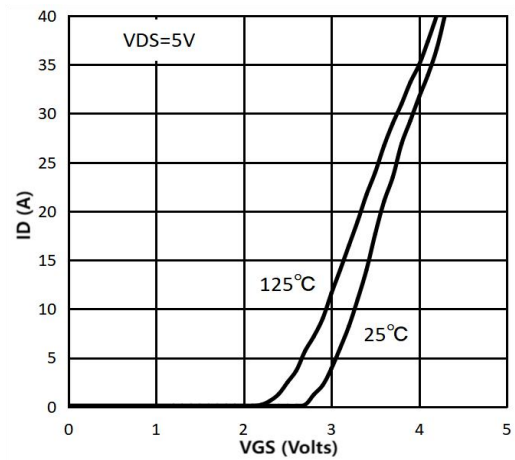


Figure 2: Transfer Characteristics

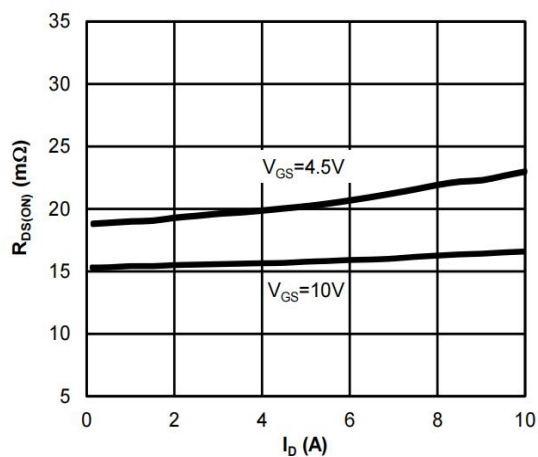


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

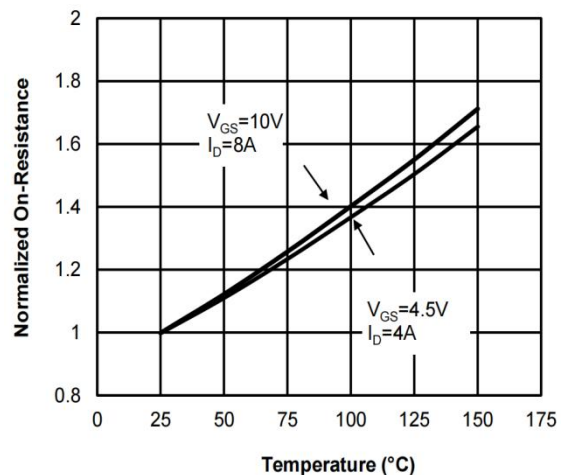


Figure 4: On-Resistance vs. Junction Temperature

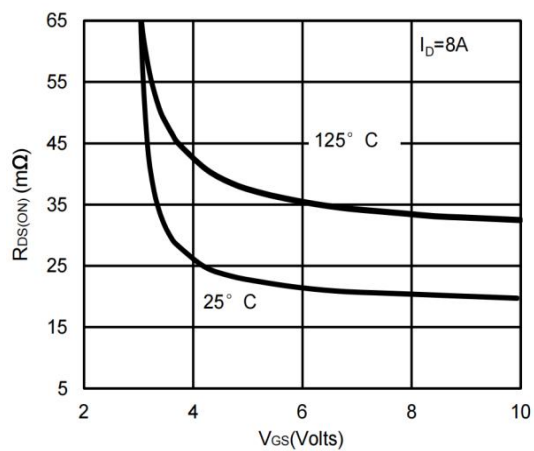


Figure 5: On-Resistance vs. Gate-Source Voltage

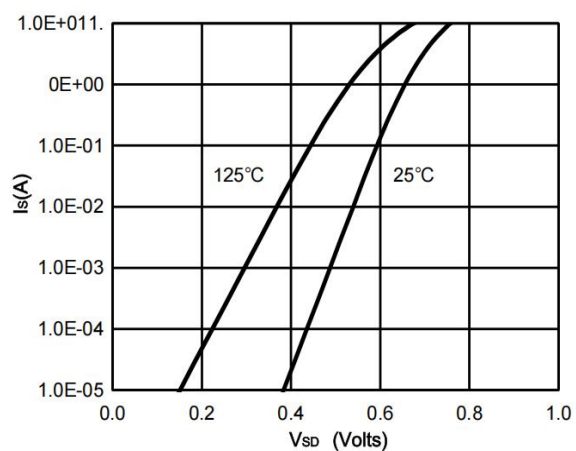


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

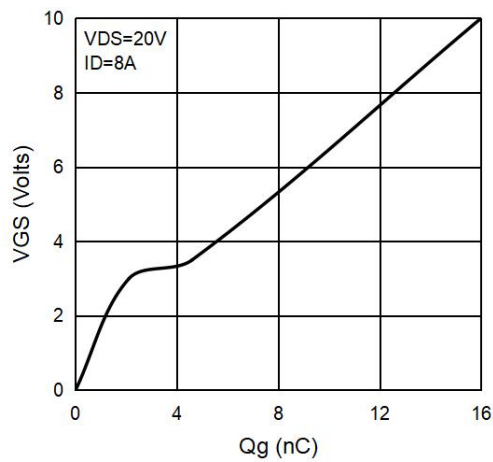


Figure 7: Gate-Charge Characteristics

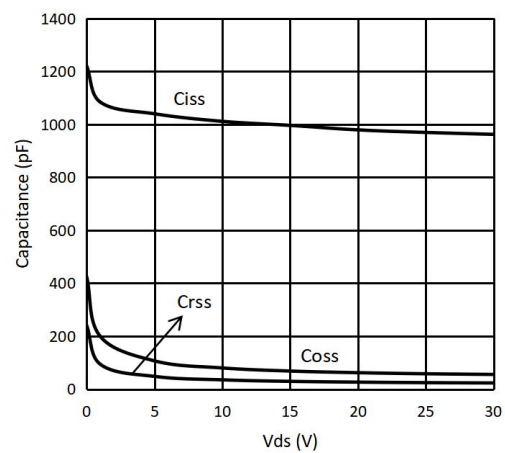


Figure 8: Capacitance Characteristics

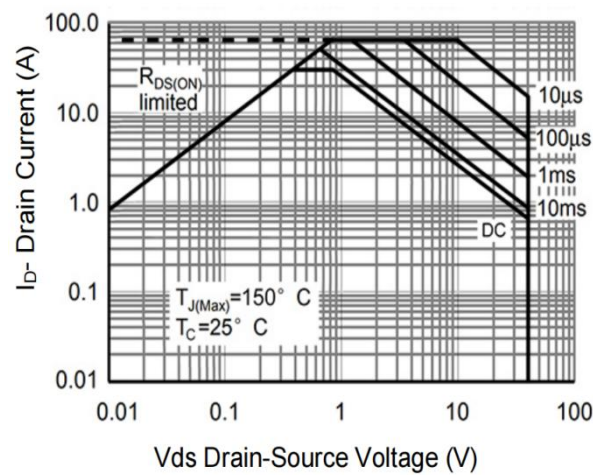


Figure 9: Maximum Forward Biased Safe Operating Area

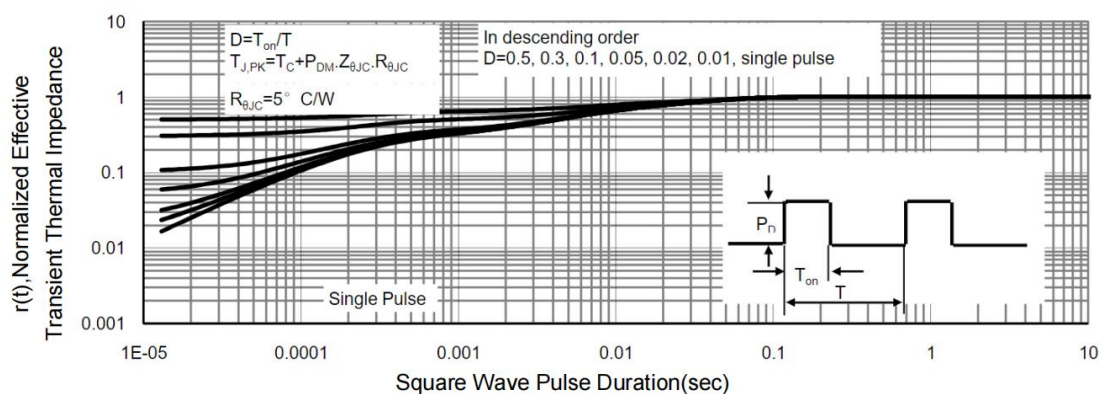


Figure 10: Normalized Maximum Transient Thermal Impedance

P-MOS Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D = -250μA, V _{GS} =0V	-40			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-40V, V _{GS} =0V			-1	μA
		T _J =55°C			-5	μA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} = ±20V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D = -250μA	-1.4	-1.9	-2.4	V
R _{DS(ON)}	Drain-Source on-Resistance	V _{GS} = -10V, I _D = -8A		30	40	mΩ
		V _{GS} = -4.5V, I _D = -4A		45	55	mΩ
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-8A		18		S
R _g	Gate resistance	f=1MHz		3.5		Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} = 0V V _{DS} = -20V f=1MHz		910		pF
C _{oss}	Output Capacitance			100		pF
C _{rss}	Reverse Transfer Capacitance			53		pF
Q _g	Total Gate Charge	V _{GS} = -10V V _{DS} = -20V I _D = -8A		15.4		nC
Q _{gs}	Gate Source Charge			3.1		nC
Q _{gd}	Gate Drain Charge			3.1		nC
t _{D(on)}	Turn-On DelayTime	V _{DD} = -20V V _{GS} = -10V R _L = 1.6Ω R _G = 3Ω		6.5		ns
t _r	Turn-On Rise Time			8		ns
t _{D(off)}	Turn-Off DelayTime			42		ns
t _f	Turn-Off Fall Time			38		ns
Drain-Source Body Diode Characteristics						
V _{SD}	Body Diode Forward Voltage	I _S = -1A V _{GS} = 0V			-1	V
t _{rr}	Body Diode Reverse Recovery Time	I _F = -12A di/dt =100 A/μs		20.8		ns
Q _{rr}	Body Diode Reverse Recovery Charge			8.8		nC

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

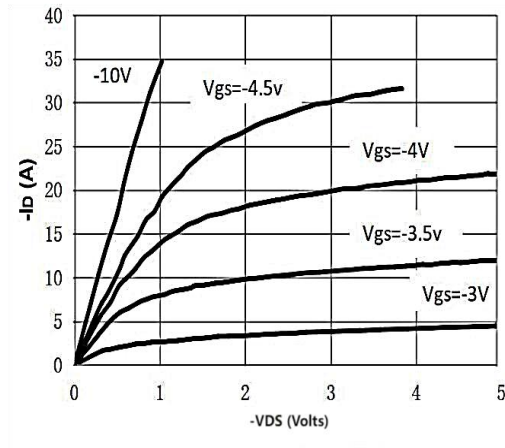


Figure 1: On-Region Characteristics

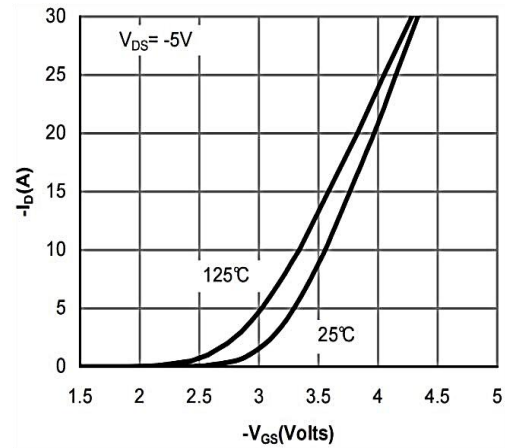


Figure 2: Transfer Characteristics

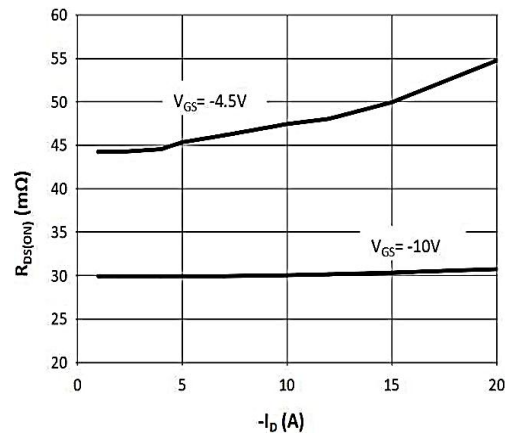


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

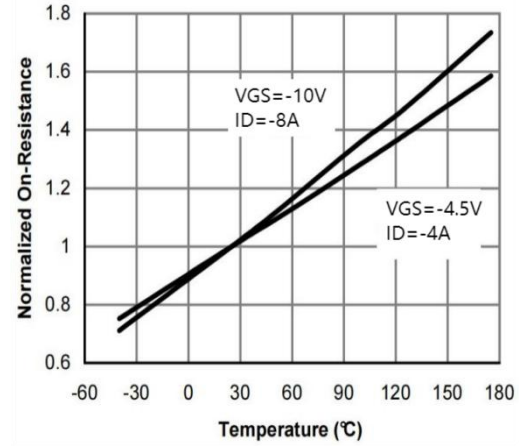


Figure 4: On-Resistance vs. Junction Temperature

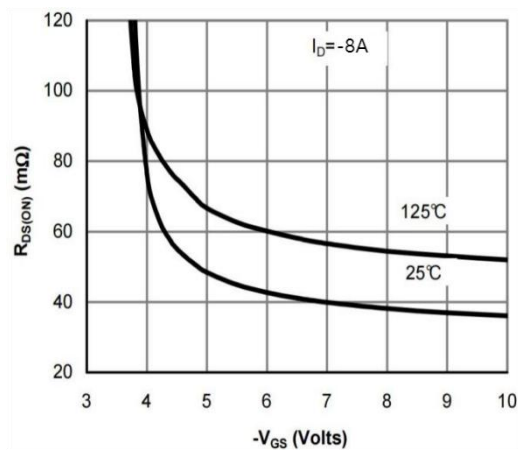


Figure 5: On-Resistance vs. Gate-Source Voltage

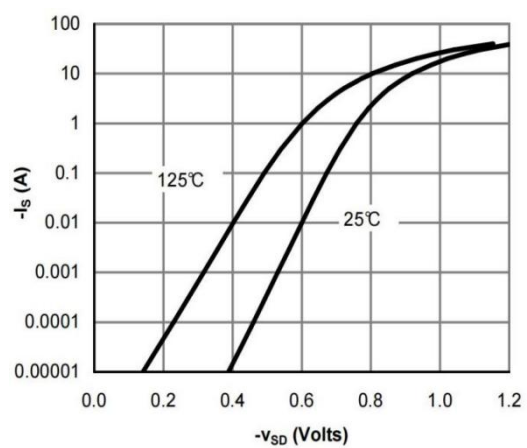


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

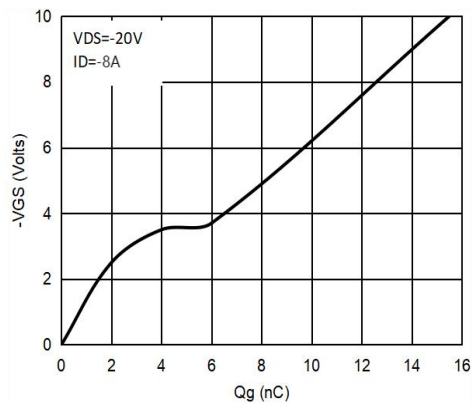


Figure 7: Gate-Charge Characteristics

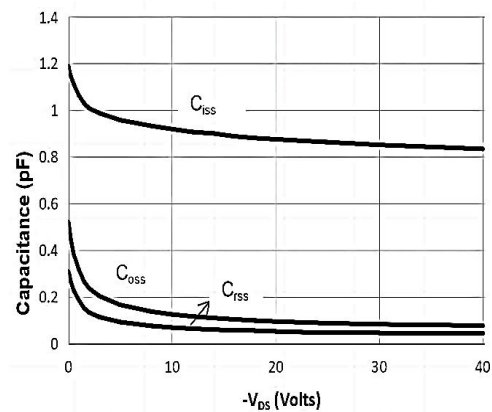


Figure 8: Capacitance Characteristics

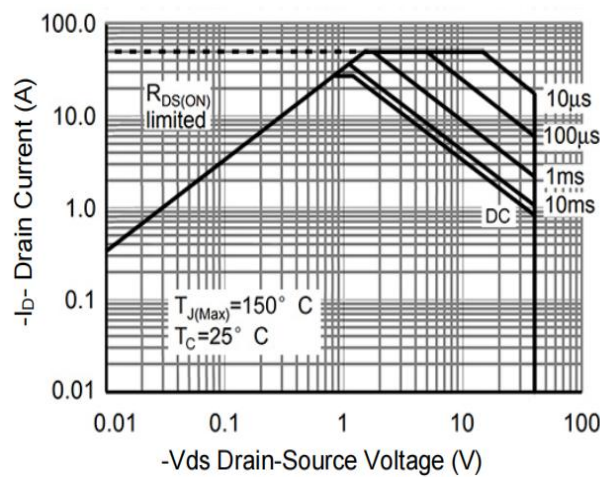


Figure 9: Maximum Forward Biased Safe Operating Area

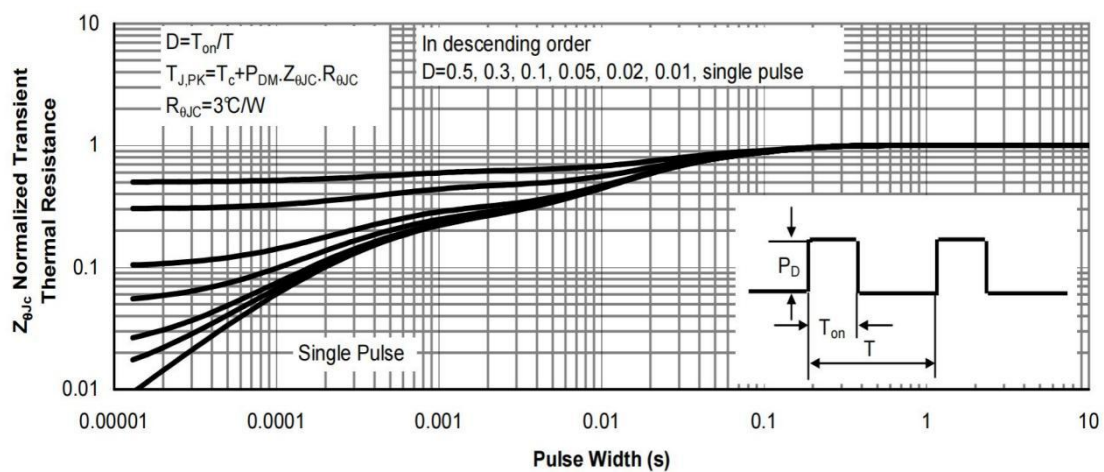
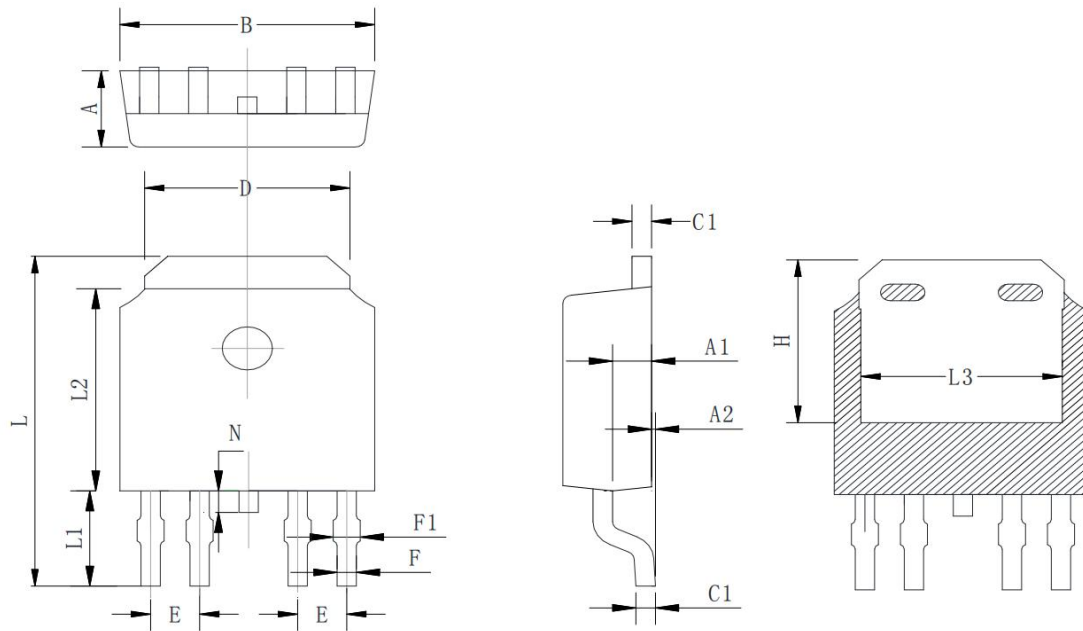


Figure 10: Normalized Maximum Transient Thermal Impedance

TO 252-4L Package



Symbol	Min	Typ	Max
A	2.20	2.30	2.40
A1	0.91	1.01	1.11
A2	0.05	0.15	0.25
B	6.45	6.60	6.75
C	0.45	0.50	0.58
C1	0.45	0.50	0.58
D	5.12	5.32	5.52
E	1.27 TYP		
F1	0.45	0.60	0.75
F	0.40	0.50	0.60
H	4.70	4.90	5.10
L	9.70	10.00	10.20
L1	2.6	2.8	3.0
L2	5.95	6.10	6.25
L3	5.00	5.20	5.40
N	0.45	0.65	0.85

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