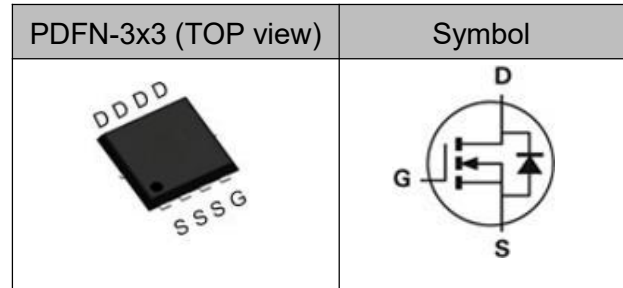


Features

- ◆ 30V, 70A, $R_{DS(ON)}(Typ.) = 3.5m\Omega @ V_{GS} = 10V$.
- ◆ Reliable and Rugged
- ◆ Fast Switching Speed
- ◆ Green Device Available
- ◆ 100% EAS Guaranteed

Application

- ◆ High Frequency Switching and Synchronous
- ◆ DC/DC Converter



Absolute Maximum Ratings $T_c = 25^\circ C$ unless otherwise noted

Symbol	Parameter	Rating	Unit
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	
I_D	Drain Current-Continuous, $T_c = 25^\circ C$	70	A
	Drain Current-Continuous, $T_c = 100^\circ C$	56	
I_{DM}	Drain Current-Pulsed ^a	280	
E_{AS}	Avalanche Energy, Single pulse ^b	85	mJ
I_{AS}	Avalanche Current	20	A
P_D	Maximum Power Dissipation @ $T_c = 25^\circ C$	37	W
T_{STG}	Store Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance Junction-Case Max	-	3.4	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient Max ^c	-	70	$^\circ C/W$

Electrical Characteristics $T_J = 25^\circ C$ unless otherwise noted

Off Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 30V, V_{GS} = 0V$	-	-	1	μA
I_{GSS}	Forward Gate Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2	1.55	2.2	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^d	$V_{GS} = 10V, I_D = 20A$	-	3.5	4.5	mΩ
		$V_{GS} = 4.5V, I_D = 15A$	-	5.5	7.0	
gfs	Forward Transconductance	$V_{DS} = 5V, I_D = 20A$	-	61	-	S

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Rg	Gate Resistance	f = 1.0MHz	-	1.9	-	Ω
Ciss	Input Capacitance	$V_{DS} = 20V,$ $V_{GS} = 0V,$ f = 1.0MHz	-	900	-	pF
Coss	Output Capacitance		-	460	-	
Crss	Reverse Transfer Capacitance		-	20	-	

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 20V, I_D = 50A,$ $R_G = 3\Omega, V_{GS} = 10V$	-	6.4	-	ns
t_r	Turn-On Rise Time		-	2.2	-	
$t_{d(off)}$	Turn-Off Delay Time		-	16	-	
t_f	Turn-Off Fall Time		-	1.8	-	
Qg	Total Gate Charge	$V_{DS} = 20V, I_D = 50A,$ $V_{GS} = 10V$	-	15.0	-	nC
Qgs	Gate-Source Charge		-	3.8	-	
Qgd	Gate-Drain Charge		-	2.3	-	

■ Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G = V_D = 0V,$ Force Current	-	-	70	A
V_{SD}	Drain-Source Diode Forward Voltage ^d	$V_{GS} = 0V, I_{SD} = 1A$	-	-	1.2	V
t_{rr}	Reverse Recovery Time	$I_F = 50A,$ $di/dt = 100A/\mu s,$ $T_J = 25^\circ C$	-	72	-	ns
Q_{rr}	Reverse Recovery Charge		-	24	-	nC

Notes:

- a: Max. current is limited by junction temperature.
- b: The EAS data shows Max. Rating. The test condition is $V_{DD} = 50V, V_{GS} = 10V, L = 0.5mH, I_{AS} = 18.5A$.
- c: Surface Mounted on 1in2 FR-4 board with 1oz.
- d: Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).
- e: Guaranteed by design, not subject to production testing.

Typical Characteristics

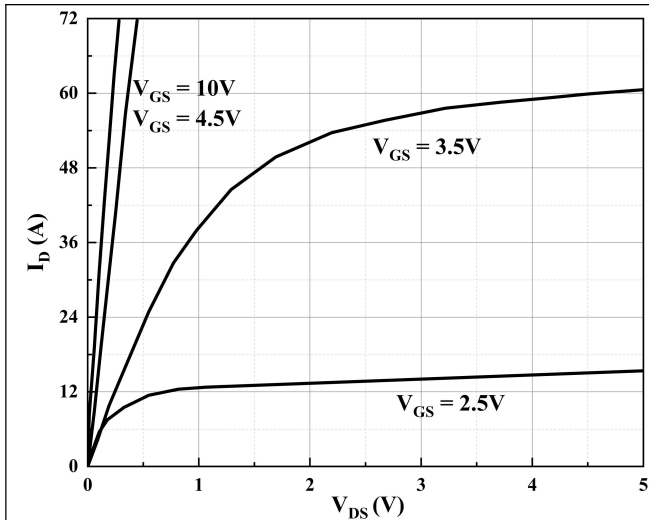


Figure 1. Output Characteristics

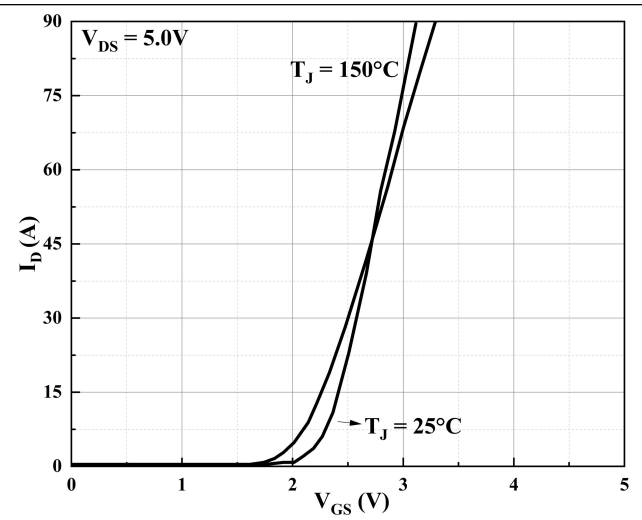


Figure 2. Transfer Characteristics

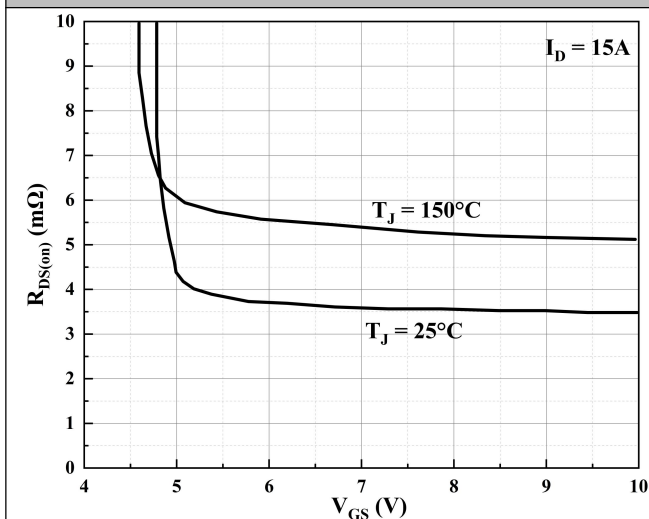


Figure 3. On-Resistance vs. V_{GS}

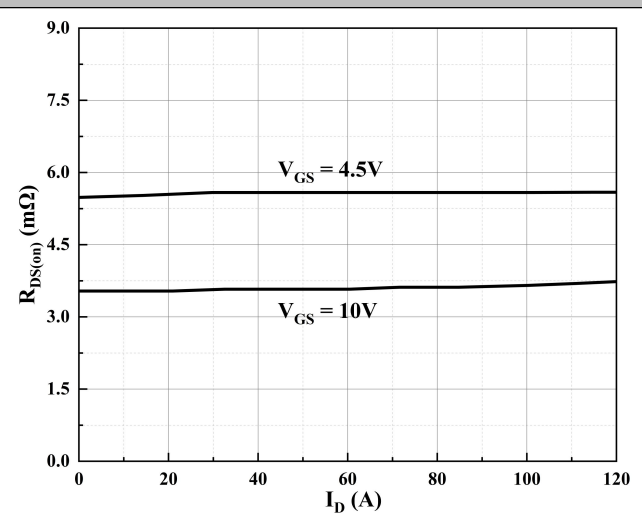


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

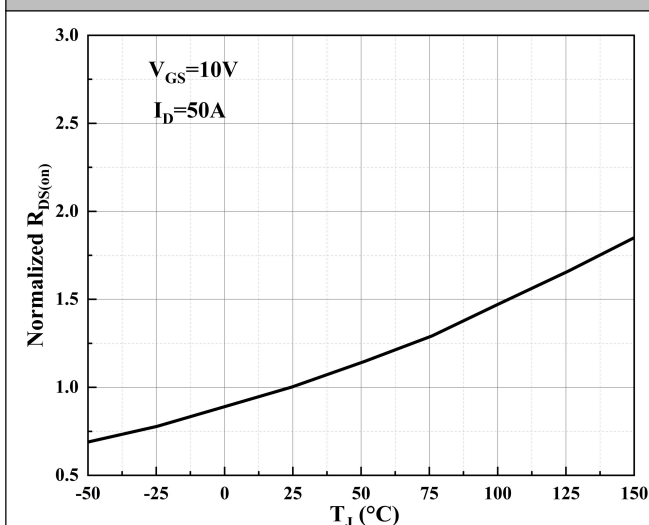


Figure 5. On-Resistance vs. Temperature

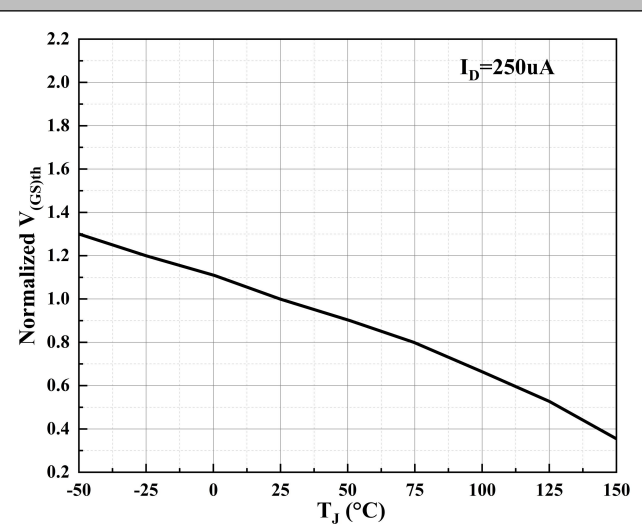


Figure 6. $V_{GS(th)}$ vs. Temperature

Typical Characteristics

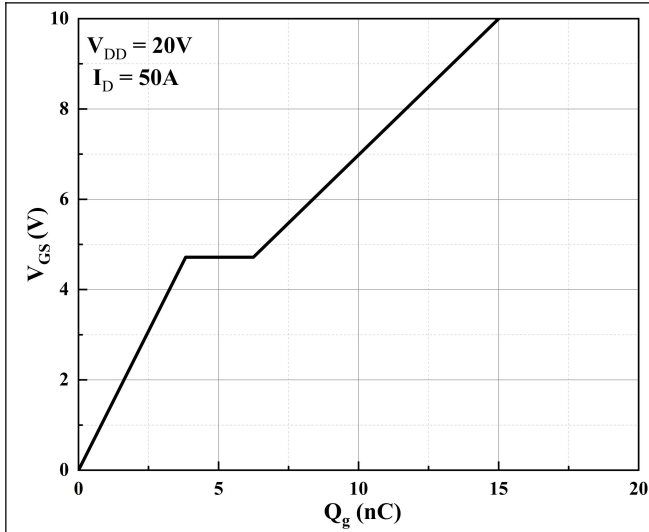


Figure 7. Gate Charge

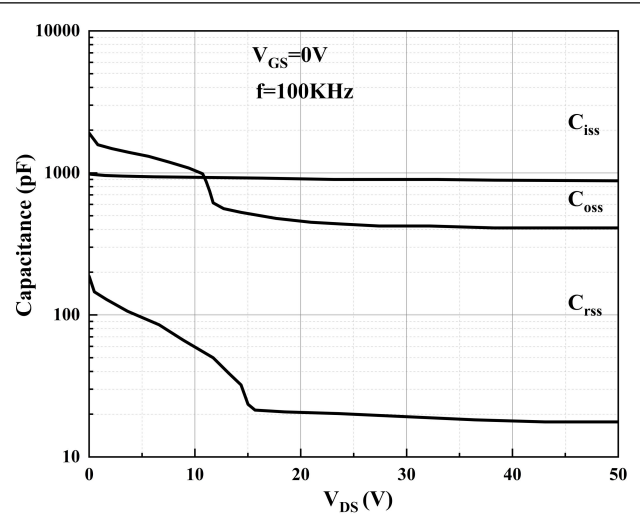


Figure 8. Capacitance

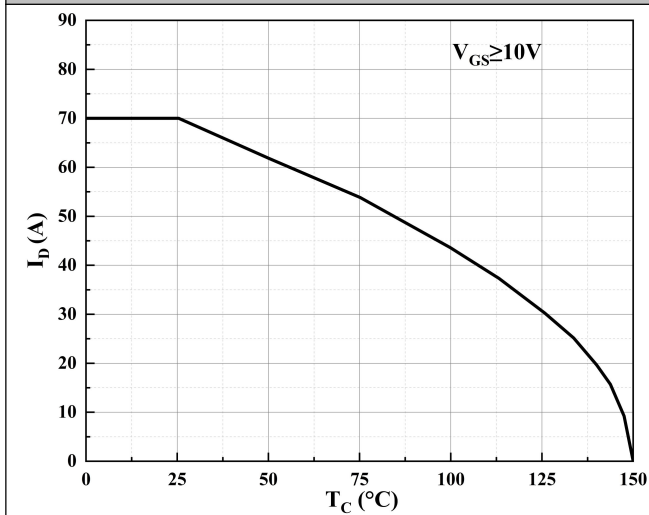


Figure 9. Drain Current Derating

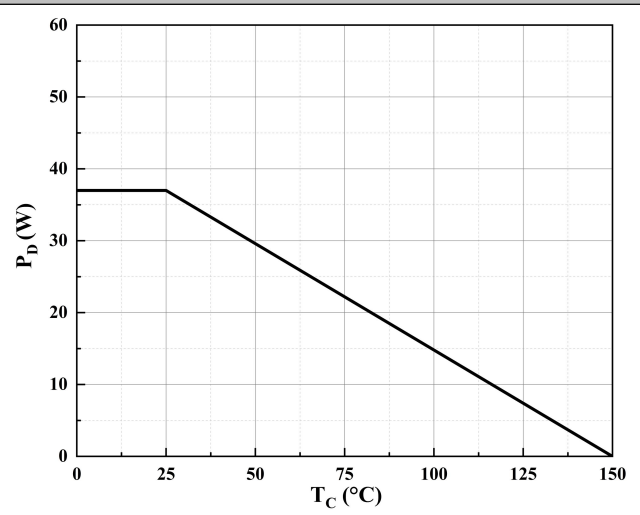


Figure 10. Power Dissipation

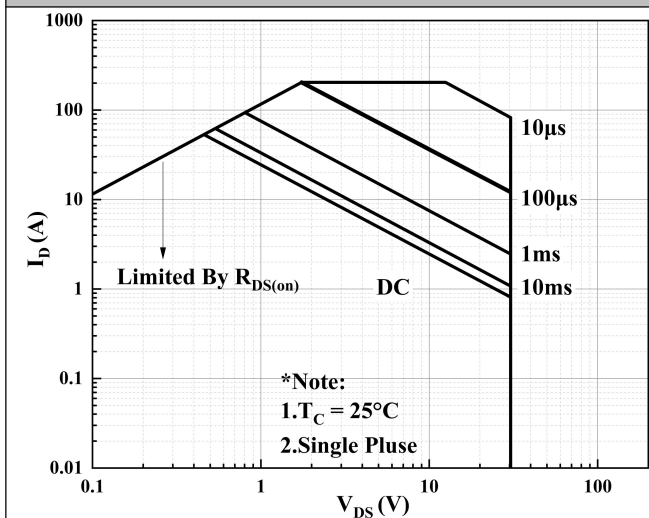


Figure 11. Safe Operating Area

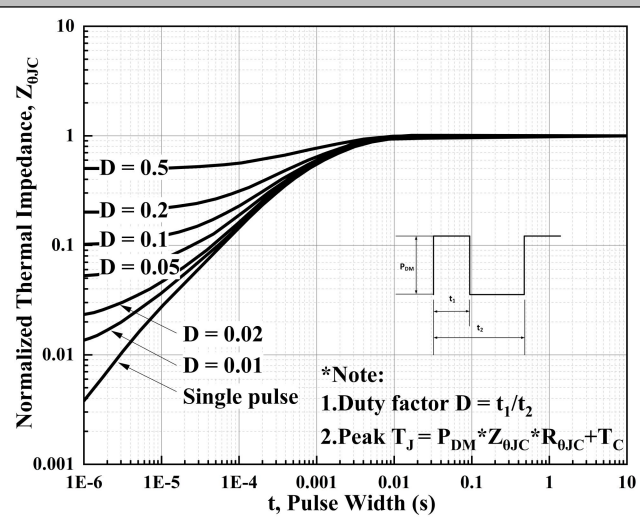
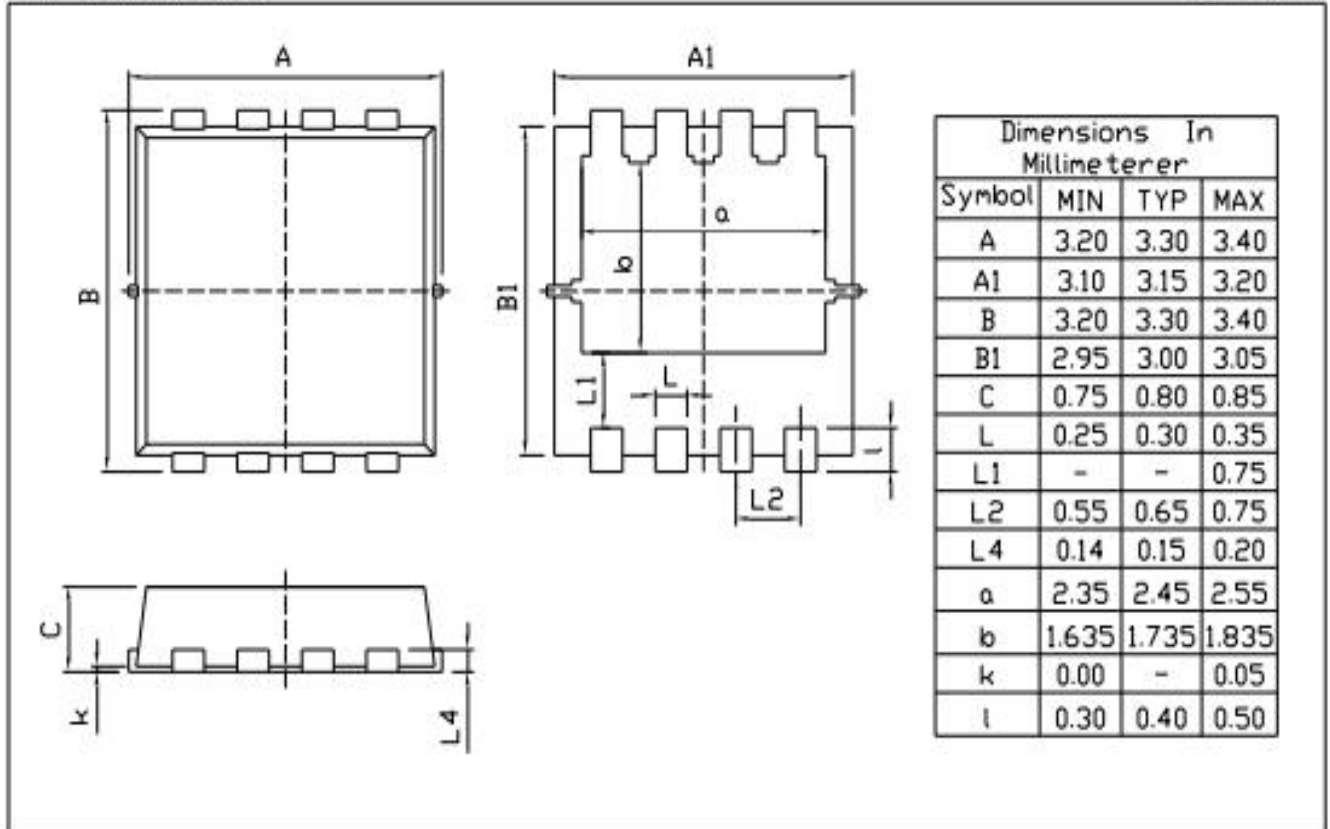


Figure 12. $R_{\theta JC}$ Transient Thermal Impedance

Package Information

PDFN3X3A-8L

Unit:mm



Rev.00 202011