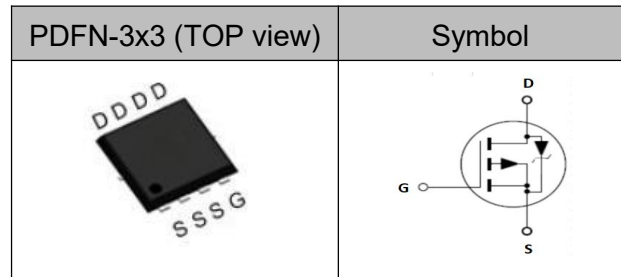


Features

- ◆ -30V, -51.8 , $R_{DS(ON)}(Typ.) = 8.6m\Omega @ V_{GS} = -10V$.
- ◆ 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, $T_c = 25^\circ C$	-51.8	A
	Drain Current-Continuous, $T_c = 100^\circ C$	-41.4	
I_{DM}	Drain Current-Pulsed ^a	-70	
E_{AS}	Avalanche Energy, Single pulse ^b	39.2	mJ
I_{AS}	Avalanche Current	-28	A
P_D	Maximum Power Dissipation @ $T_c = 25^\circ C$	41.7	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	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient Max ^c	-	80	$^\circ C/W$

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	$V_{DS} = -24V, V_{GS} = 0V$	-	-	-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	1.5	-2	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^d	$V_{GS} = -10V, I_D = -13A$	-	8.6	10.5	mΩ
		$V_{GS} = -4.5V, I_D = -9A$	-	11.5	15	
gfs	Forward Transconductance	$V_{DS} = -5V, I_D = -13A$	-	25	-	S

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	$V_{DS} = -15V,$ $V_{GS} = 0V,$ $f = 1.0MHz$	-	2828	-	pF
C_{oss}	Output Capacitance		-	343	-	
C_{rss}	Reverse Transfer Capacitance		-	291	-	

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = -15V, I_D = -1A,$ $R_G = 6\Omega, V_{GS} = -10V$	-	11.4	-	nS
t_r	Turn-On Rise Time		-	24	-	
$t_{d(off)}$	Turn-Off Delay Time		-	104	-	
t_f	Turn-Off Fall Time		-	56.8	-	
Qg	Total Gate Charge	$V_{DS} = -25V, I_D = -13A,$ $V_{GS} = -4.5V$	-	33	-	nC
Qg	Total Gate Charge	$V_{DS} = -25V, I_D = -13A,$ $V_{GS} = -10V$	-	65	-	
Qgs	Gate-Source Charge		-	8.7	-	
Qgd	Gate-Drain Charge		-	15	-	

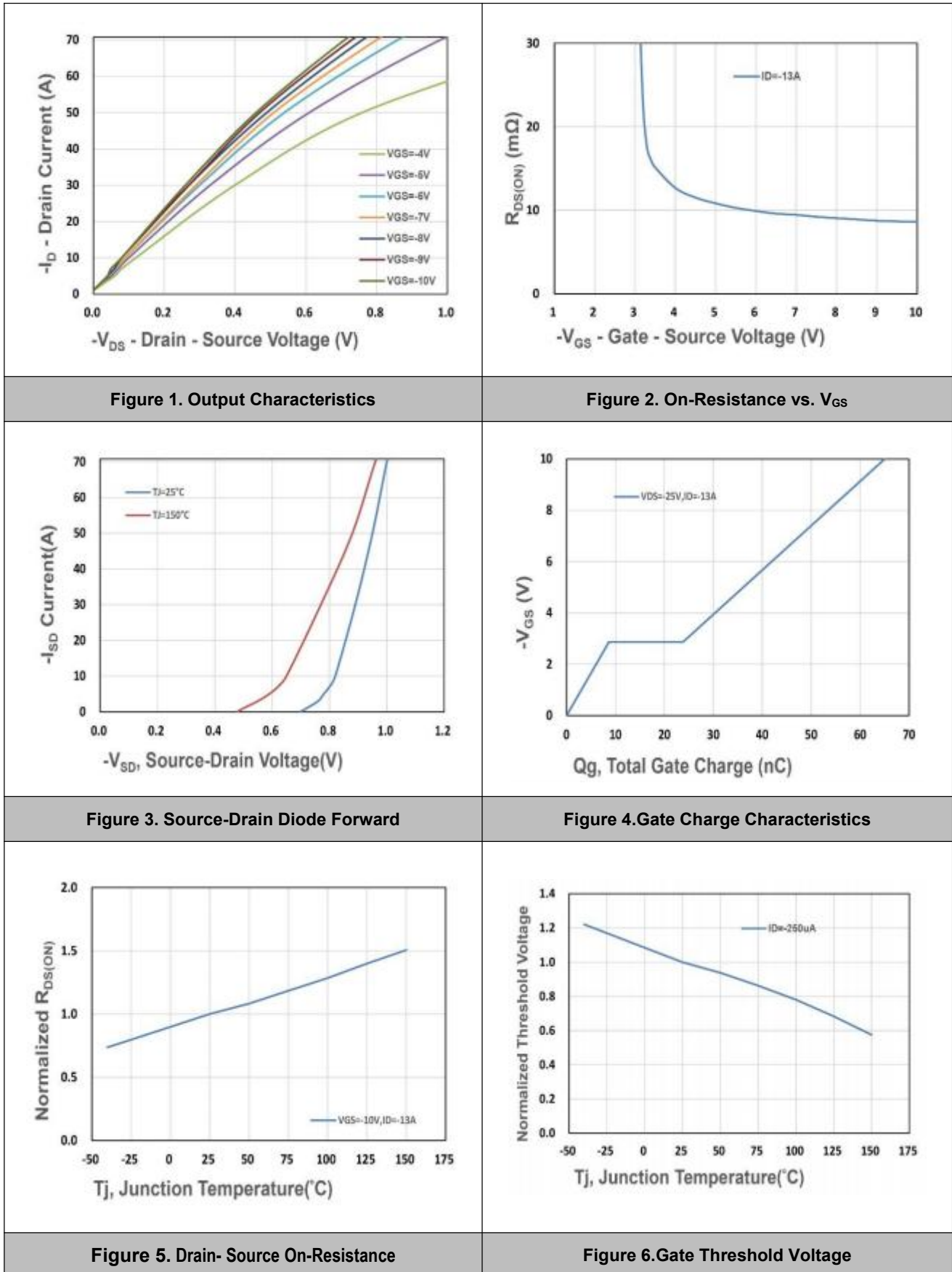
■ Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
R_G	Gate Resistance	$V_{DS} = V_{GS} = 0V,$ Freq.=1MHz	-	6.6	-	Ω
V_{SD}	Drain-Source Diode Forward Voltage ^d	$V_{GS} = 0V, I_{SD} = -3A$	-	-0.75	-1.1	V
t_{rr}	Reverse Recovery Time	$I_F = -20A,$ $di/dt = 100A/us,$ $T_J = 25^\circ C$	-	15.6	-	nS
Q_{rr}	Reverse Recovery Charge		-	7.9	-	nC

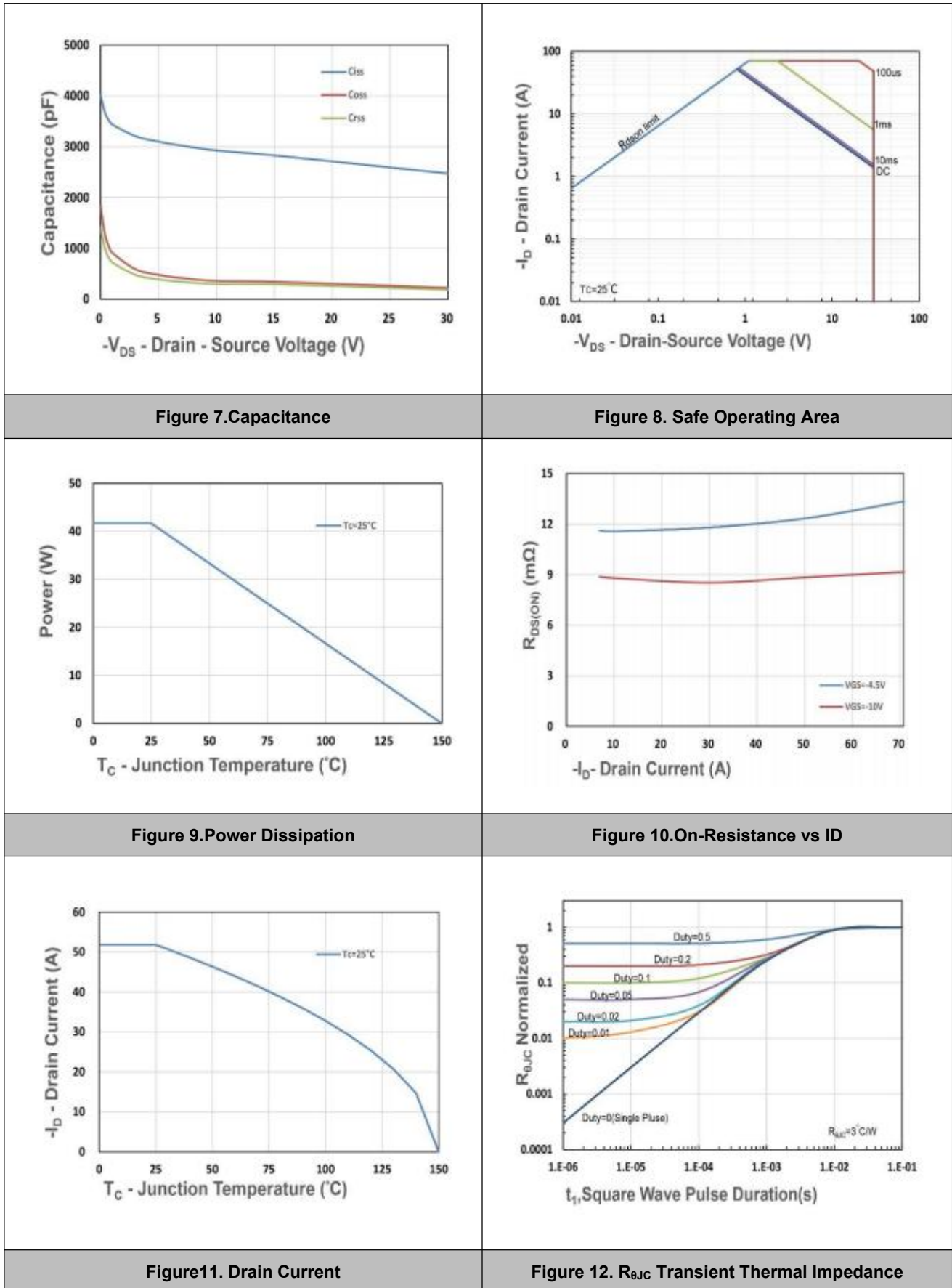
Notes:

- a: Max. current is limited by junction temperature.
- b: The EAS data shows Max. Rating. The test condition is $V_{DD} = 50V, V_{GS} = 10V, L = 0.1mH, I_{AS} = 23A$.
- 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



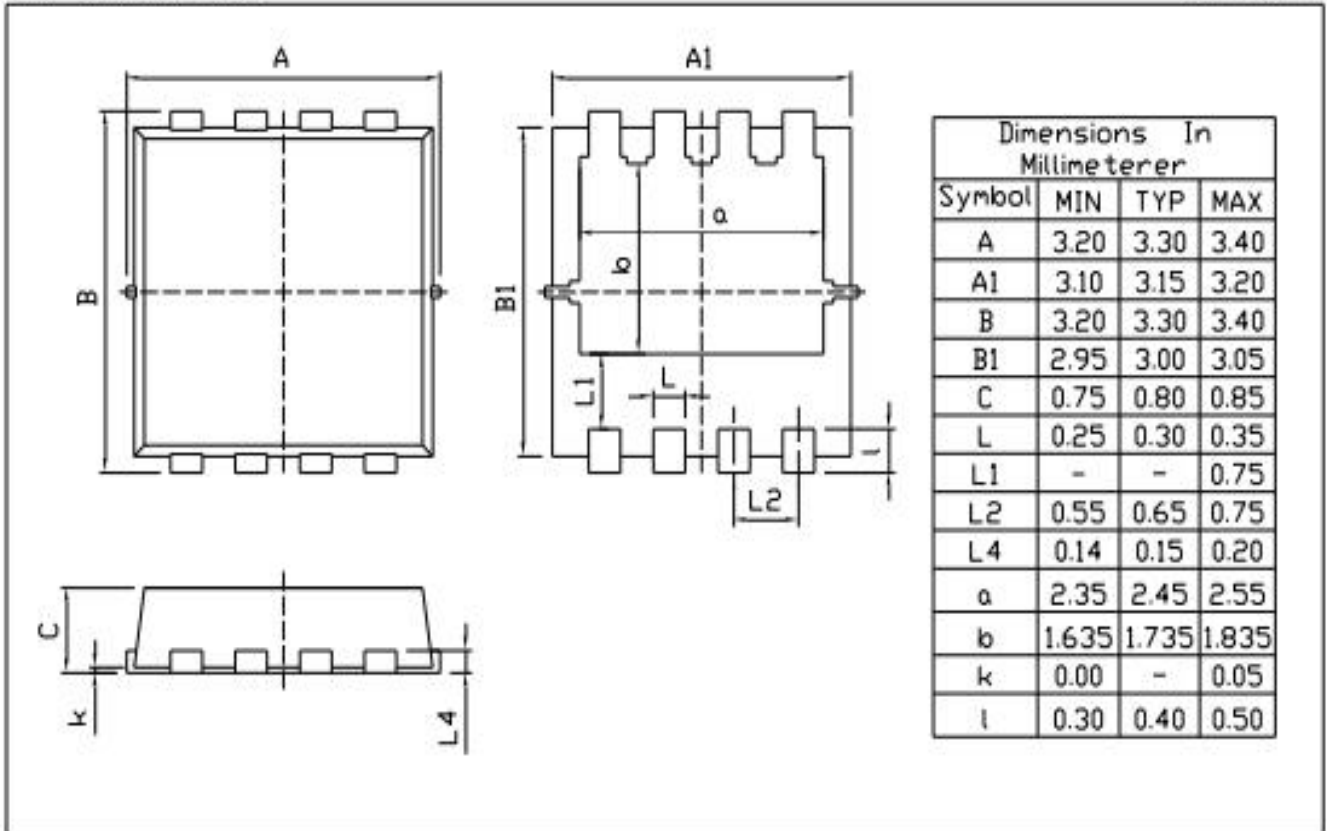
■ Typical Characteristics



Package Information

PDFN3X3A-8L

Unit:mm



Rev.00 202011