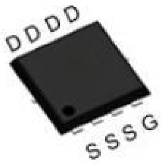
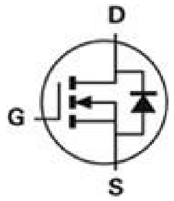
MU3001X

N-Channel Enhancement Mode MOSFET

Features

- ◆ 30V, 64A, $R_{DS(ON)}$(Typ.) = 4.1mΩ@V_{GS} = 10V.
- ◆ Reliable and Rugged
- ◆ Fast Switching Speed
- ◆ Green Device Available
- ◆ 100% EAS Guaranteed

PDFN-3x3 (TOP view)	Symbol
	

Application

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

Absolute Maximum Ratings Tc = 25° 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°C	64	A
	Drain Current-Continuous, T_c =100°C	40	
I_{DM}	Drain Current-Pulsed [a]	71	
E_{AS}	Avalanche Energy, Single pulse [b]	39	mJ
I_{AS}	Avalanche Current	28	A
P_D	Maximum Power Dissipation @ T_c =25°C	31	W
T_{STG}	Store Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance Junction-Case Max	-	4	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient Max[c]	-	60	°C/W

Electrical Characteristics T_J = 25° 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 = 250μA	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} = ±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 =250μA	1.1	-	2.1	V
R_{DS}(on)	Static Drain-Source On-Resistance [d]	V_{GS} = 10V, I_D = 20A	-	4.1	4.8	mΩ
		V_{GS} = 4.5V, I_D = 18A	-	5.3	6.9	
gfs	Forward Transconductance	V_{DS}= 5V, I_D= 20A	-	22	-	S

Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Ciss	Input Capacitance	V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz	-	1859	-	pF
Coss	Output Capacitance		-	260	-	
Crss	Reverse Transfer Capacitance		-	212	-	

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 = 6Ω,V_{GS}=10V	-	9.6	-	ns
t_r	Turn-On Rise Time		-	23.4	-	
$t_{d(off)}$	Turn-Off Delay Time		-	62.8	-	
t_f	Turn-Off Fall Time		-	23	-	
Qg	Total Gate Charge	V_{DS} = 25V, I_D = 14A, V_{GS} = 4.5V	-	26	-	
Qg	Total Gate Charge	V_{DS} = 25V, I_D = 14A, V_{GS} = 10V	-	48	-	nC
Qgs	Gate-Source Charge		-	3.4	-	
Qgd	Gate-Drain Charge		-	14	-	

Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
R_G	Gate Resistance	V_{DS}=V_{GS}=0V, Freq.=1MHz	-	2.2	-	Ω
V_{SD}	Drain-Source Diode Forward Voltage[d]	V_{GS} = 0V, I_{SD} = 1A	-	-	1.1	V
t_{rr}	Reverse Recovery Time	I_F= 2A, di/dt=100A/us, T_J=25°C	-	18.2	-	ns
Q_{rr}	Reverse Recovery Charge		-	9.2	-	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⩽300us, duty cycle⩽2%).

e：Guaranteed by design, not subject to production testing.

Typical Characteristics

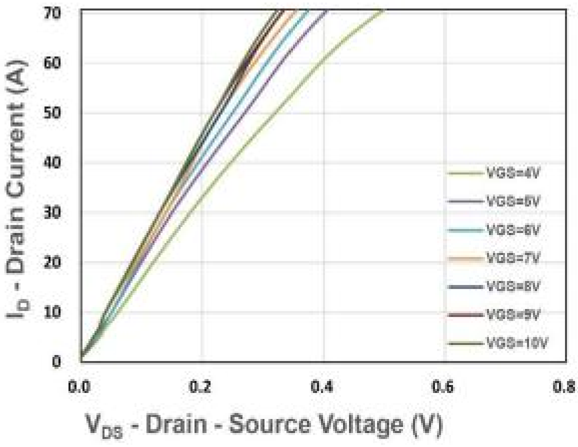


Figure 1. Output Characteristics

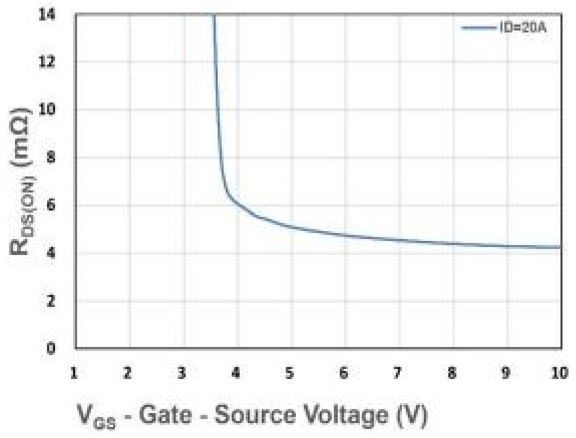


Figure 2. On-Resistance vs. V_{GS}

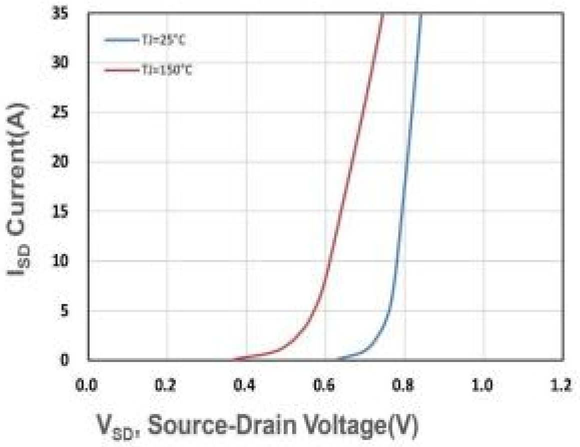


Figure 3. Source-Drain Diode Forward

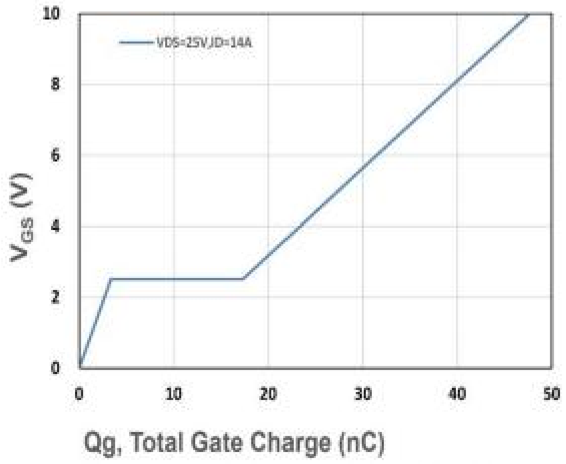


Figure 4.Gate Charge Characteristics

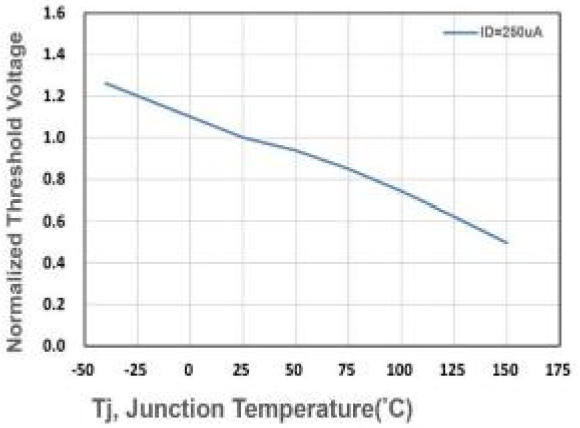


Figure 5. Gate Threshold Voltage

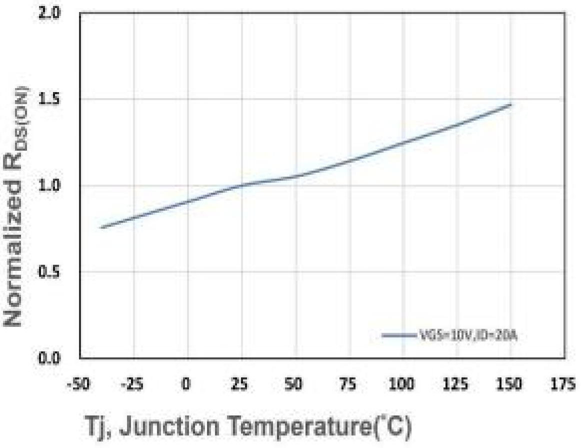


Figure 6.Drain-Source On Resistance

Typical Characteristics

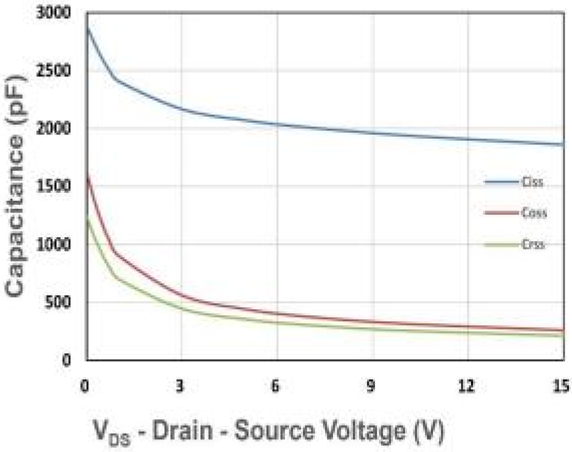


Figure 7.Capacitance

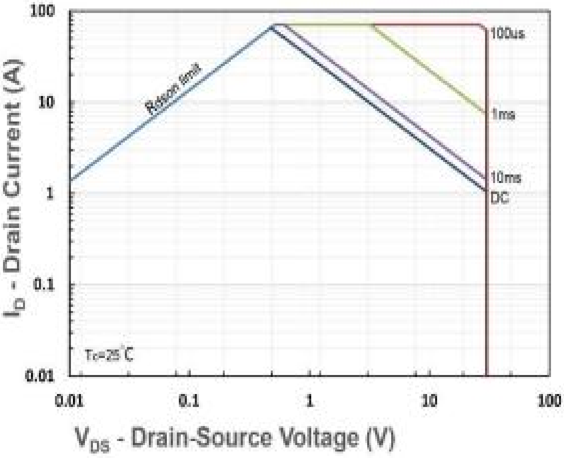


Figure 8. Safe Operating Area

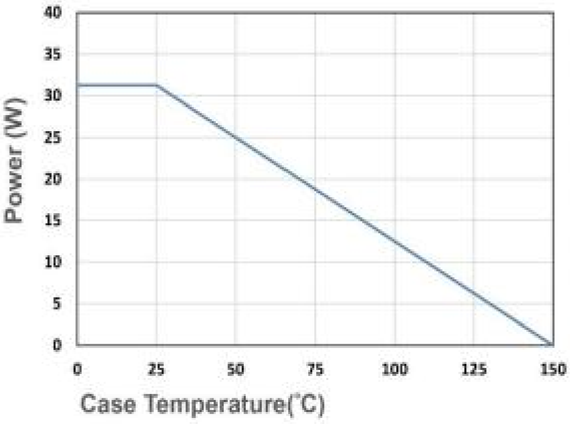


Figure 9.Power Dissipation

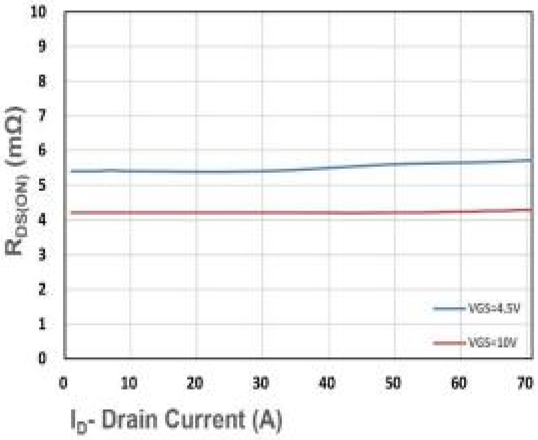


Figure 10.On-Resistance vs ID

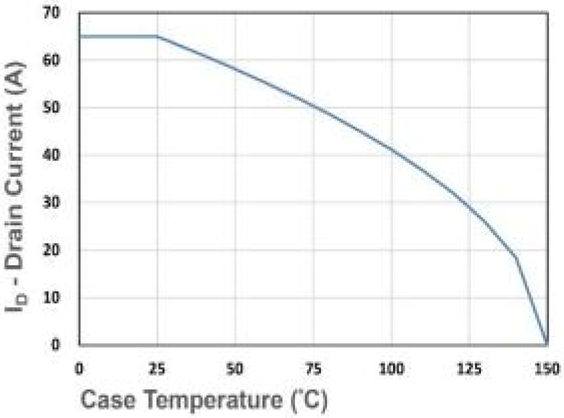


Figure11. Drain Current

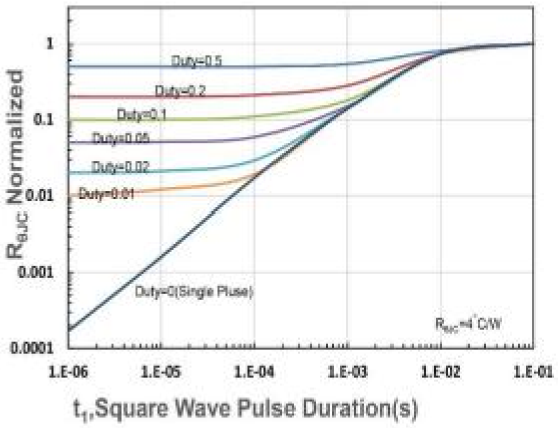
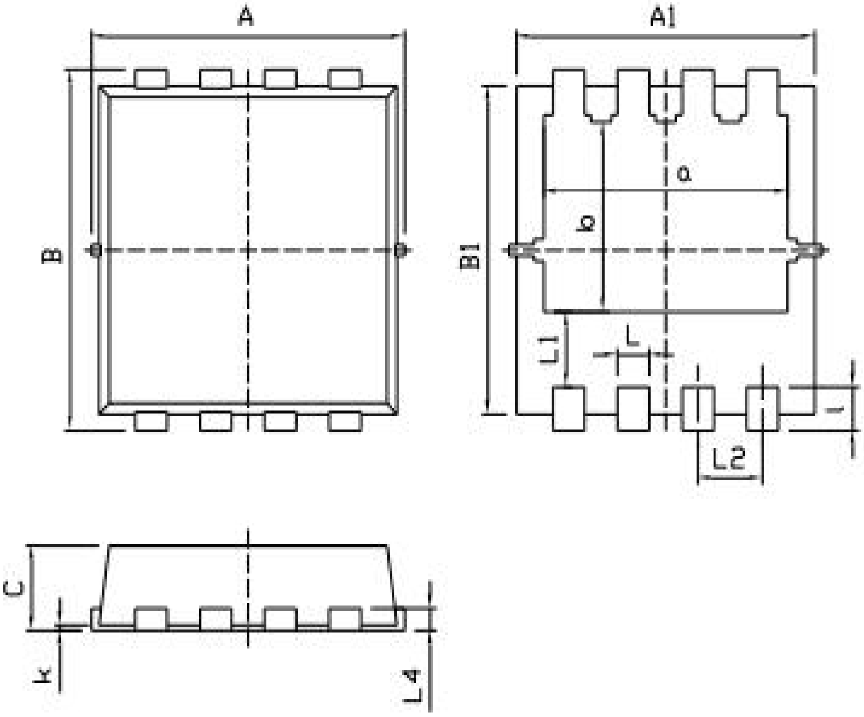


Figure 12. $R_{\theta JC}$ Transient Thermal Impedance

Package Information

PDFN3X3A-8L

Unit:mm



Dimensions In Millimeterer			
Symbol	MIN	TYP	MAX
A	3.20	3.30	3.40
A1	3.10	3.15	3.20
B	3.20	3.30	3.40
B1	2.95	3.00	3.05
C	0.75	0.80	0.85
L	0.25	0.30	0.35
L1	-	-	0.75
L2	0.55	0.65	0.75
L4	0.14	0.15	0.20
a	2.35	2.45	2.55
b	1.635	1.735	1.835
k	0.00	-	0.05
l	0.30	0.40	0.50

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