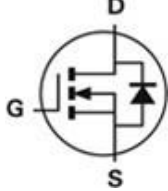


Features

- ◆ 100V, 91A, $R_{DS(ON)}(Typ.) = 6.5m\Omega @ V_{GS} = 10V$.
- ◆ Reliable and Rugged
- ◆ Fast Switching Speed
- ◆ Green Device Available
- ◆ 100% EAS Guaranteed

Application

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

PDFN-5x6 (TOP view)	Symbol
	

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

Symbol	Parameter	Rating	Unit
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	
I_D	Drain Current-Continuous, $T_c = 25^\circ C$	91	A
	Drain Current-Continuous, $T_c = 100^\circ C$	57	
I_{DM}	Drain Current-Pulsed ^a	106	
E_{AS}	Avalanche Energy, Single pulse ^b	45	mJ
I_{AS}	Avalanche Current	30	A
P_D	Maximum Power Dissipation @ $T_c = 25^\circ C$	65.8	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	-	1.9	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient Max ^c	-	50	$^\circ C/W$

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	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 80V, V_{GS} = 0V$	-	-	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	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	-	3.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^d	$V_{GS} = 10V, I_D = 20A$	-	6.5	8	mΩ
		$V_{GS} = 4.5V, I_D = 10A$	-	9.5	12.5	
gfs	Forward Transconductance	$V_{DS} = 5V, I_D = 10A$	-	25.8	-	S

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Ciss	Input Capacitance	$V_{DS} = 50V,$ $V_{GS} = 0V,$ Freq.= 1.0MHz	-	2111	-	pF
Coss	Output Capacitance		-	579	-	
Crss	Reverse Transfer Capacitance		-	38	-	

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 30V, I_D = 1A,$ $R_G = 1\Omega, V_{GS} = 10V$	-	14.5	-	ns
t_r	Turn-On Rise Time		-	8.1	-	
$t_{d(off)}$	Turn-Off Delay Time		-	13.5	-	
t_f	Turn-Off Fall Time		-	107	-	
Qg	Total Gate Charge	$V_{DS} = 50V, I_D = 20A,$ $V_{GS} = 4.5V$	-	22.5	-	nC
Qg	Total Gate Charge	$V_{DS} = 50V, I_D = 20A,$ $V_{GS} = 10V$	-	43.3	-	
Qgs	Gate-Source Charge		-	8.1	-	
Qgd	Gate-Drain Charge		-	10.8	-	

■ Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
R_G	Gate Resistance	$V_{DS} = V_{GS} = 0V,$ Freq.=1MHz	-	1	-	Ω
I_S	Continuous Source Current	$V_G = V_D = 0V,$ Force Current	-	-	60	A
V_{SD}	Drain-Source Diode Forward Voltage ^d	$V_{GS} = 0V, I_{SD} = 10A$	-	0.75	1.1	V
t_{rr}	Reverse Recovery Time	$I_F = 10A, V_R = 50V$ $di/dt = 100A/\mu s,$ $T_J = 25^\circ C$	-	45.5	-	ns
Q_{rr}	Reverse Recovery Charge		-	51.1	-	nC

Notes:

a: Max. current is limited by junction temperature.

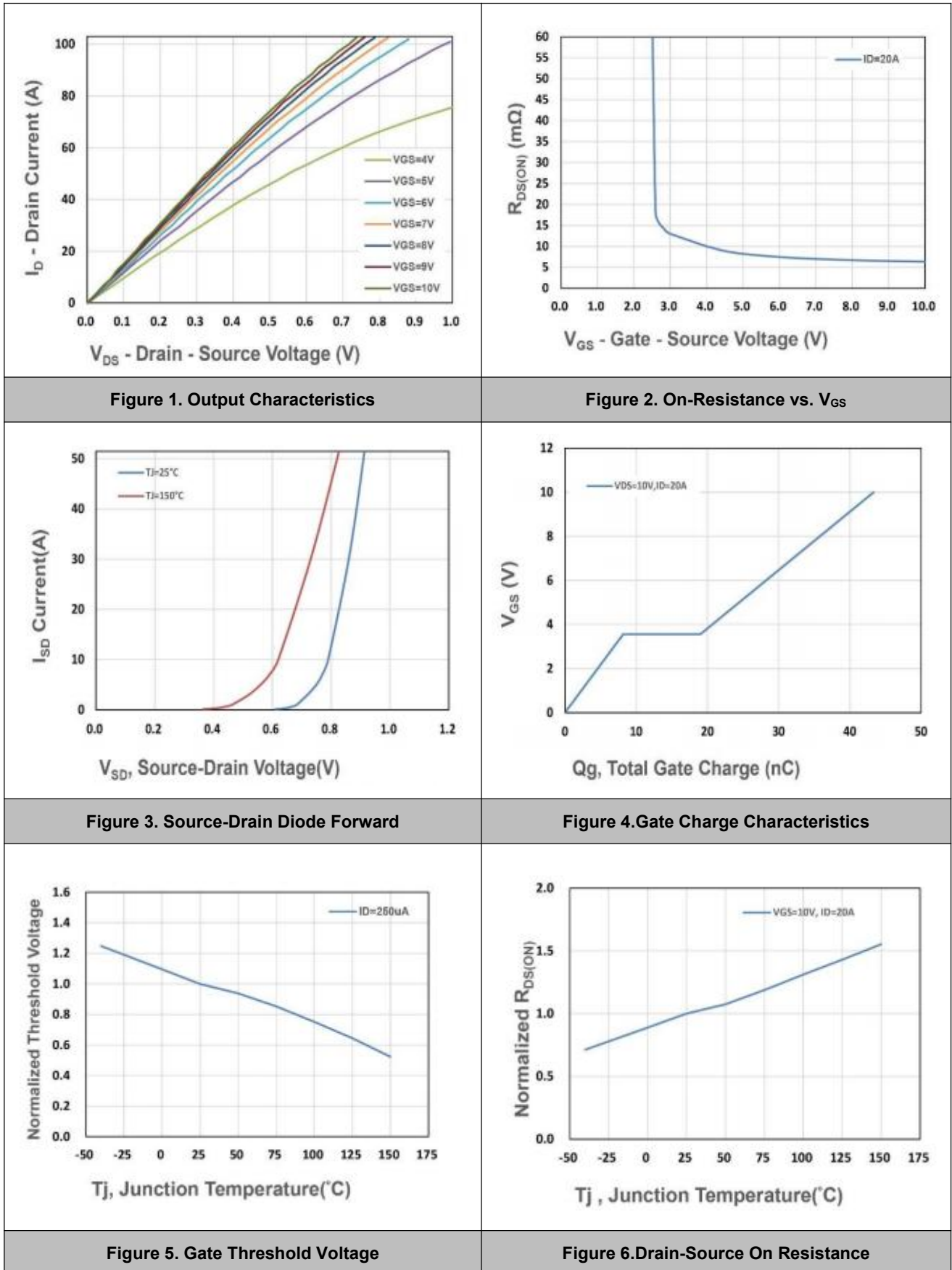
b: The EAS data shows Max. Rating. The test condition is $V_{DD} = 50V, V_{GS} = 10V, L = 0.1mH, I_{AS} = 23A$.

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

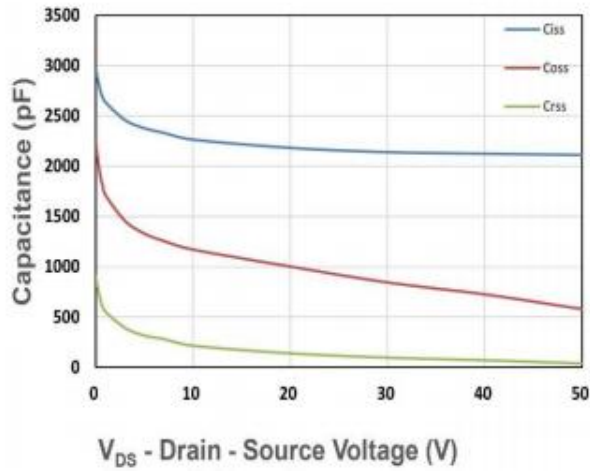


Figure 7. Capacitance

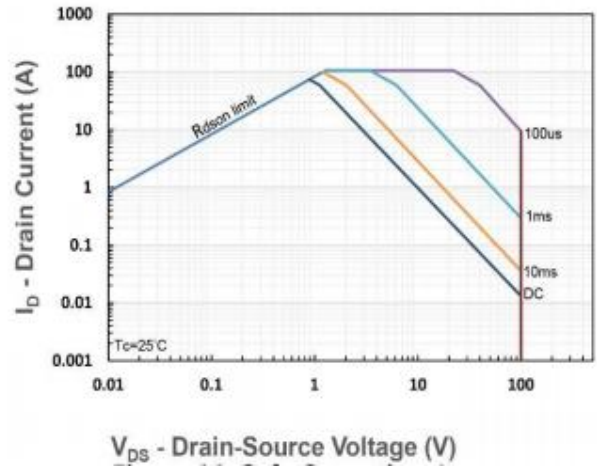


Figure 8. Safe Operating Area

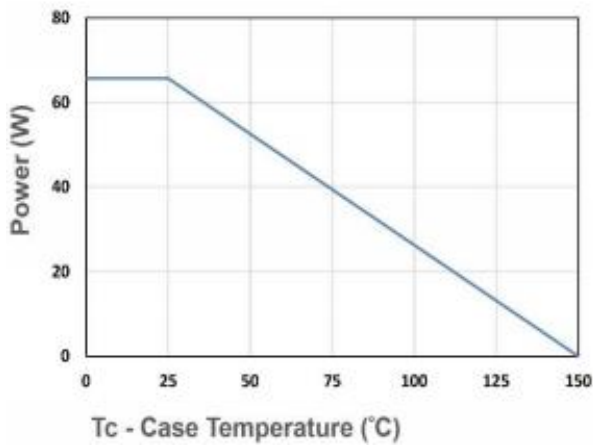


Figure 9. Power Dissipation

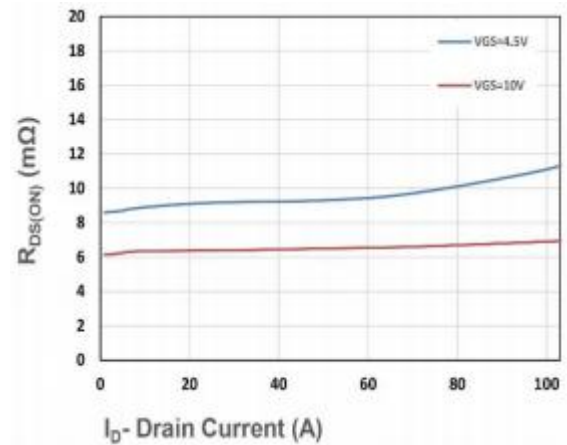


Figure 10. On-Resistance vs ID

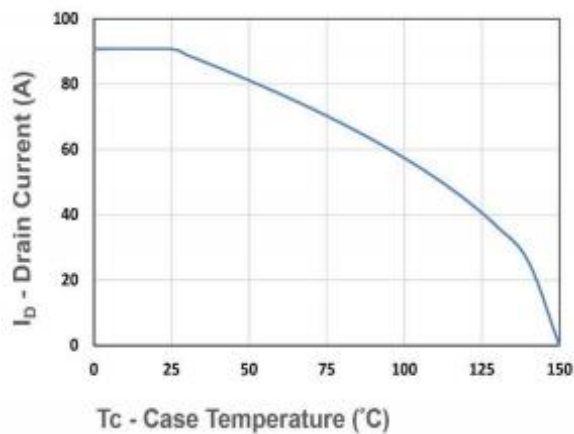


Figure11. Drain Current

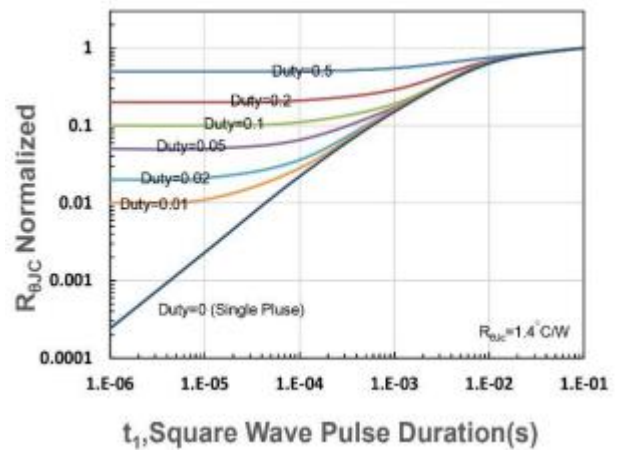
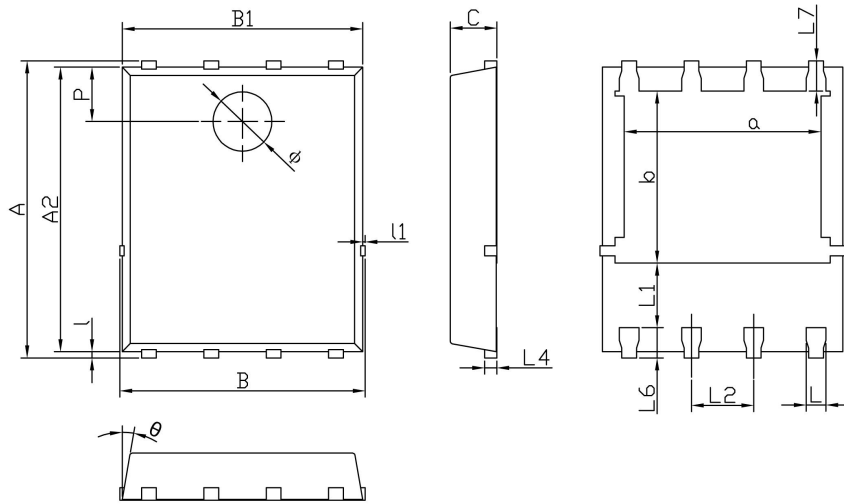


Figure 12. $R_{\theta JC}$ Transient Thermal Impedance

Package Information

PDFN5 X6

Unit:mm



Dimensions In Millimeterer			
Symbol	MIN	TYP	MAX
A	5.90	6.00	6.10
a	3.91	4.01	4.11
A2	5.70	5.75	5.80
B	4.90	5.00	5.10
b	3.37	3.47	3.57
B1	4.80	4.90	5.00
C	0.90	0.95	1.00
L	0.35	0.40	0.45
l	0.06	0.13	0.20
L1	1.10	-	-
l1	-	-	0.10
L2	1.17	1.27	1.37
L4	0.21	0.26	0.34
L6	0.51	0.61	0.71
L7	0.51	0.61	0.71
P	1.00	1.10	1.20
θ	8°	10°	12°
ϕ	1.10	1.20	1.30