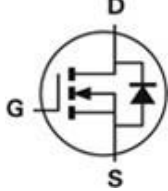


Features

- ◆ 150V, 54A, $R_{DS(ON)}(Typ.) = 16m\Omega @ V_{GS} = 10V$.
- ◆ 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	150	V
V_{GS}	Gate-Source Voltage	± 20	
I_D	Drain Current-Continuous, $T_c = 25^\circ C$	54	A
	Drain Current-Continuous, $T_c = 100^\circ C$	34	
I_{DM}	Drain Current-Pulsed ^a	215	
E_{AS}	Avalanche Energy, Single pulse ^b	225	mJ
I_{AS}	Avalanche Current	30	A
P_D	Maximum Power Dissipation @ $T_c = 25^\circ C$	125	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	Max.	Unit
$R_{\theta JC}$	Thermal Resistance Junction-Case Max	1.0	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient Max ^c	45	$^\circ C/W$

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	$V_{GS} = 0V, I_D = 250\mu A$	150	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 150V, V_{GS} = 0V$	-	-	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	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	-	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^d	$V_{GS} = 10V, I_D = 20A$	-	16	20	mΩ

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
R_g	Gate Resistance	$f = 1.0MHz$	-	0.7	-	Ω
C_{iss}	Input Capacitance	$V_{DS} = 75V,$ $V_{GS} = 0V,$ $Freq. = 1.0MHz$	-	2290	-	pF
C_{oss}	Output Capacitance		-	210	-	
C_{rss}	Reverse Transfer Capacitance		-	18	-	

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 75V, I_D = 20A,$ $R_{GEN} = 3\Omega, V_{GS} = 10V$	-	15	-	ns
t_r	Turn-On Rise Time		-	19	-	
$t_{d(off)}$	Turn-Off Delay Time		-	22	-	
t_f	Turn-Off Fall Time		-	5	-	
Q_g	Total Gate Charge	$V_{DS} = 75V, I_D = 20A,$ $V_{GS} = 0 \text{ to } 10V$	-	32	-	nC
Q_{gs}	Gate-Source Charge		-	13	-	
Q_{gd}	Gate-Drain Charge		-	6	-	

■ Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Maximum Continuous Body Diode Forward Current		-	-	54	A
I_{SM}	Maximum Pulsed Body Diode Forward Current		-	-	215	
V_{SD}	Drain-Source Diode Forward Voltage ^d	$V_{GS} = 0V, I_{SD} = 20A$	-	-	1.2	V
t_{rr}	Reverse Recovery Time	$I_F = 20A,$ $di/dt = 100A/\mu s,$	-	49	-	ns
Q_{rr}	Reverse Recovery Charge		-	67	-	nC

Notes:

a: Max. current is limited by junction temperature.

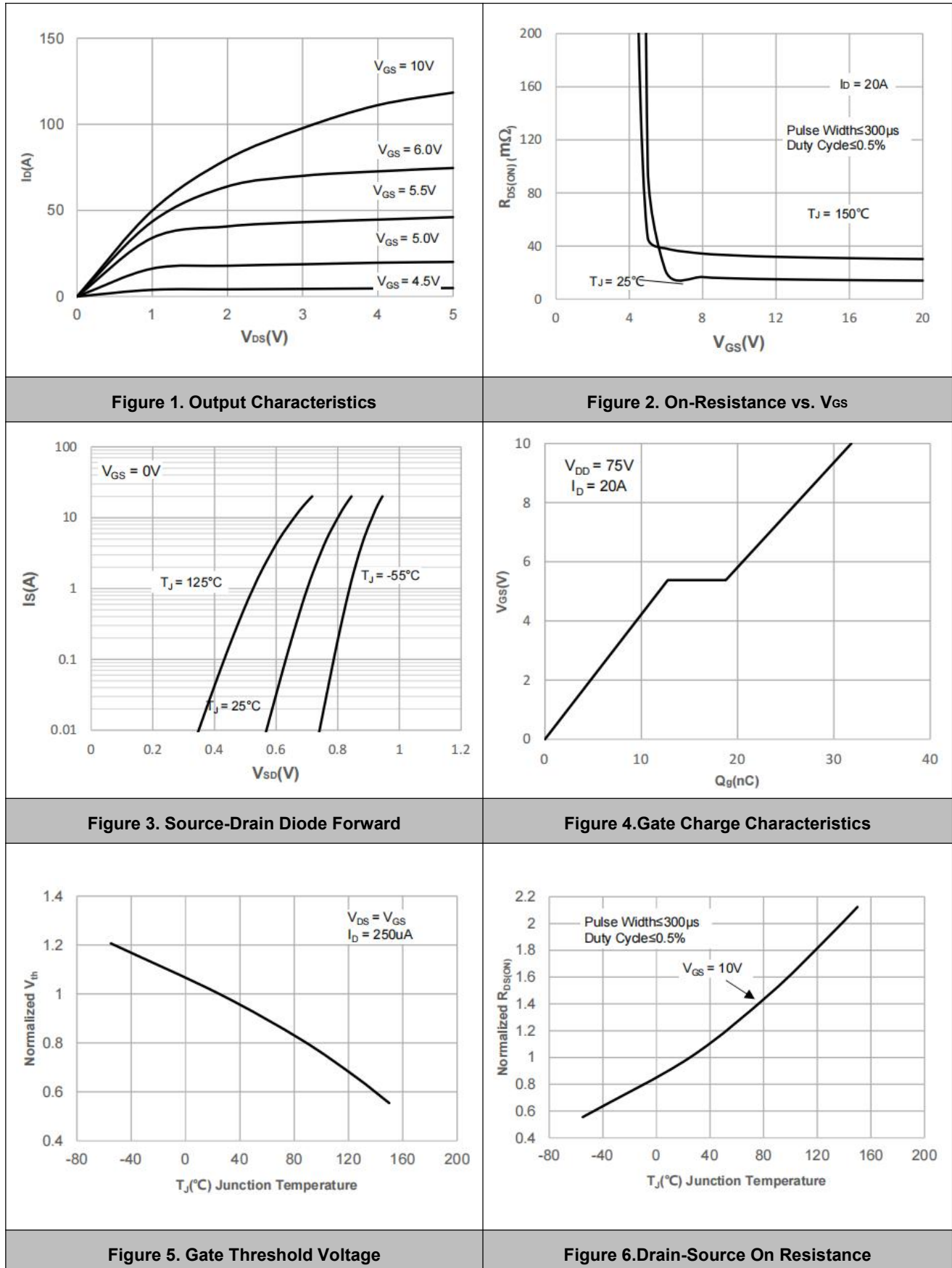
b: The EAS data shows Max. Rating. The test condition is $V_{DD} = 50V, V_{GS} = 10V, L = 0.5mH, I_{AS} = 30A$.

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

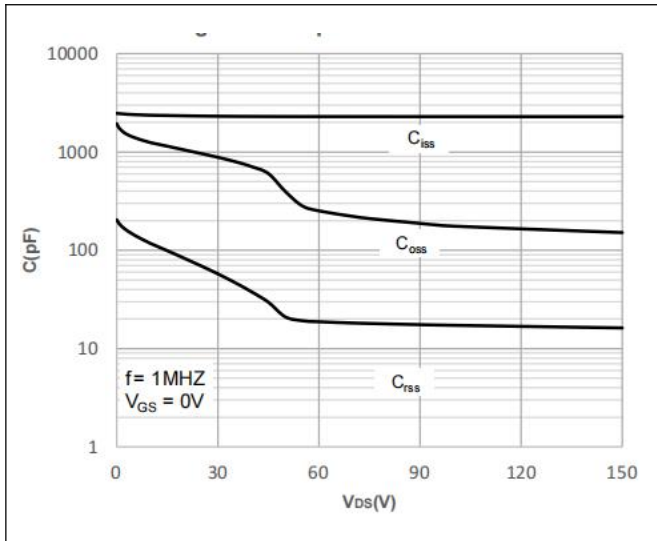


Figure 7. Capacitance

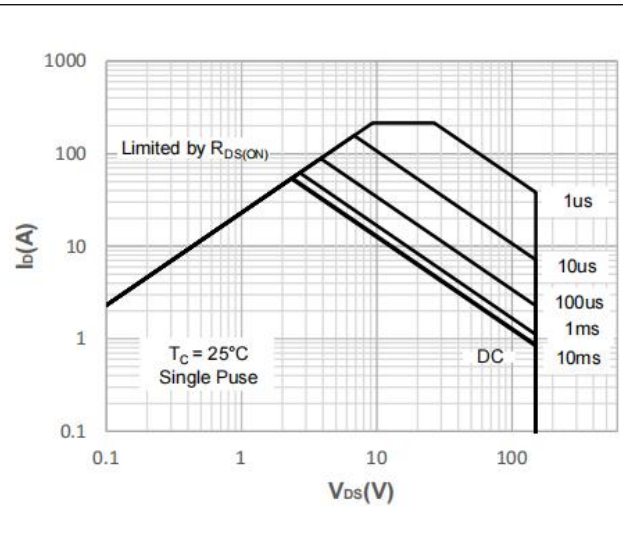


Figure 8. Safe Operating Area

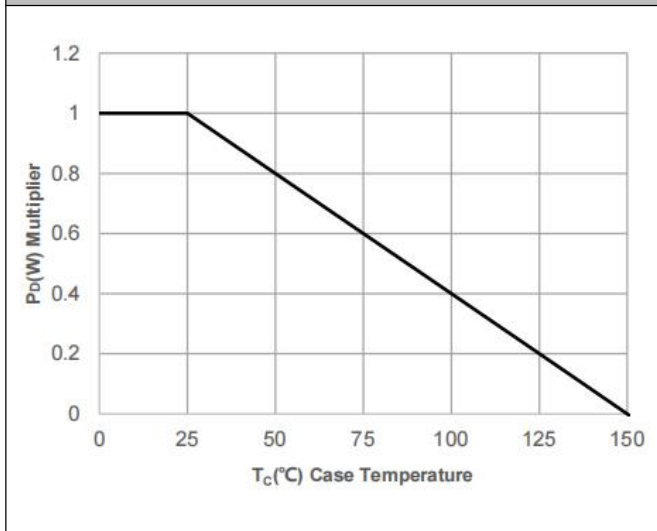


Figure 9. Power Dissipation

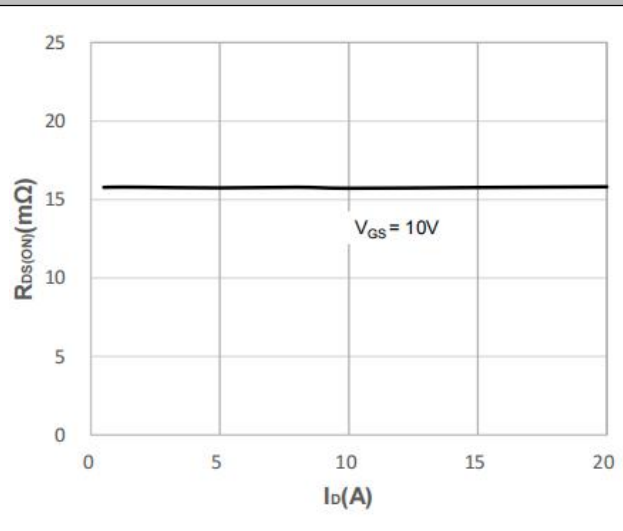


Figure 10. On-Resistance vs I_D

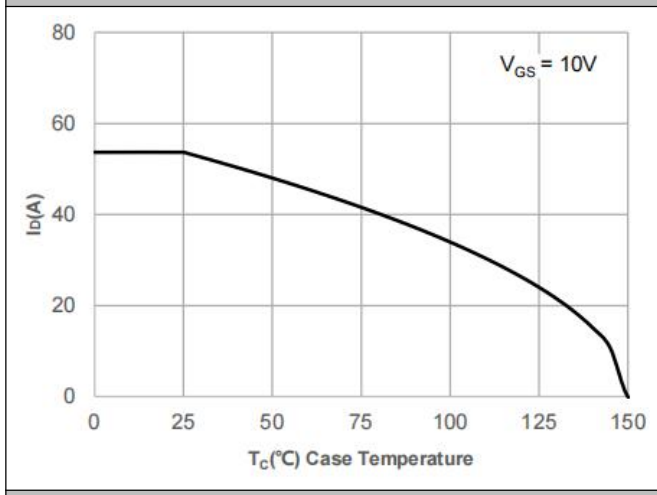


Figure 11. Drain Current

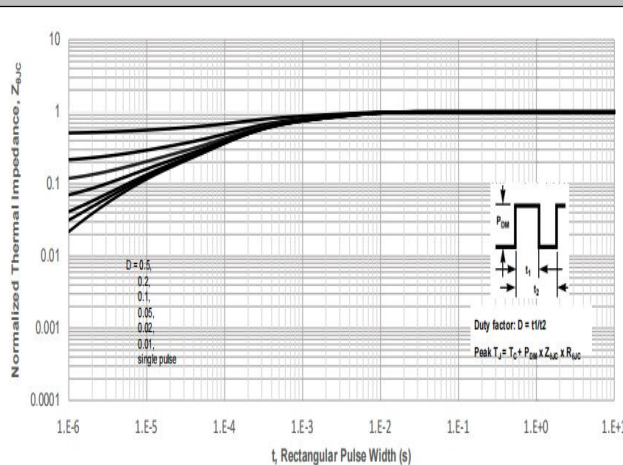


Figure 12. Normalized Maximum Transient Thermal Impedance

Package Information

PDFN5 X6

Unit:mm

