

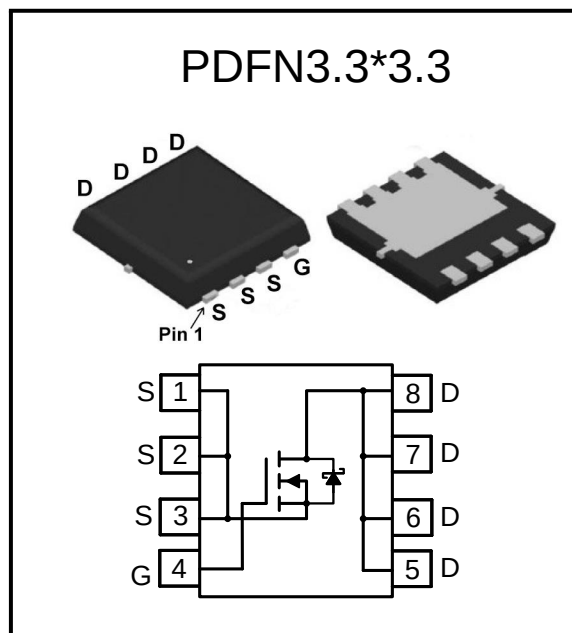
Features

- $V_{DS}=40V$
- $I_D=50A$
- $R_{DS(ON)} @ V_{GS}=10V, TYP=6.2m\Omega$
- $R_{DS(ON)} @ V_{GS}=4.5V, TYP=9m\Omega$

General Description

- Low $R_{DS(ON)}$
- Extremely low switching loss
- Excellent stability and uniformity
- Fast switching and soft recovery

Package



Application

- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Absolute Maximum Ratings ($T_J=25^\circ C$ unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DS}	Drain-Source Voltage		40	V
V_{GS}	Gate-Source Voltage		± 20	V
I_D	Drain Current	$T_C=25^\circ C$	50	A
		$T_C=100^\circ C$	28	
I_{DM}	Drain Current-Pulse		200	A
E_{AS}	Single Pulsed Avalanche Energy		38	mJ
P_D	Power Dissipation ⁽⁴⁾	$T_C=25^\circ C$	26	W
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient		62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance From Junction to Case		4.8	$^\circ C/W$
T_J	Junction Temperature		-55 to +150	$^\circ C$
T_{stg}	Storage Temperature Range		-55 to +150	$^\circ C$



Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D=250\mu A$	40	—	—	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_{DS}=250\mu A$	1.1	1.5	2.2	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 40V, V_{GS}=0V$	—	—	1	μA
Gate- Source Leakage Current,Forward	I_{GSSF}	$V_{GS} = +20V, V_{DS}=0V$	—	—	100	nA
Gate- Source Leakage Current,Reverse	I_{GSSR}	$V_{GS} = -20V, V_{DS}=0V$	—	—	-100	
Static Drain-source On Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=15A$	—	6.2	7.7	m Ω
		$V_{GS}=4.5V, I_D=10A$	—	9.0	12	
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=20A$	—	17	—	S
Input capacitance	C_{iss}	$V_{DS} = 20V,$ $V_{GS} = 0V,$ $f = 1MHz$	—	648	—	pF
Output capacitance	C_{oss}		—	359	—	
Reverse transfer capacitance	C_{rss}		—	19	—	
Turn-on delay time	$T_{d(on)}$	$V_{DS}=20V,$ $V_{GS}=10V,$ $I_D=20A,$ $R_G=3\Omega$	—	8.0	—	nS
Turn-on Rise time	T_r		—	6.0	—	
Turn -Off Delay Time	$T_{d(off)}$		—	32	—	
Turn -Off Fall time	T_f		—	9	—	
Gate to Source Charge	Q_g	$V_{DS}=20V,$ $V_{GS}=10V,$ $I_D=20A$	—	11.5	—	nC
Gate to Drain Charge	Q_{gs}		—	2.1	—	
Gate to Drain Charge	Q_{gd}		—	2.2	—	
Max. Diode ForwardCurrent	I_S	—	—	—	50	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=10A,$	—	—	1.2	V
Reverse Recovery Time	T_{rr}	$I_F=20A,$ $di/dt=500A/\mu s$	—	26	—	nS
Reverse Recovery Charge	Q_{rr}		—	58	—	nC

Note:

- (1)The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- (2)The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- (3)The EAS data shows Max. rating . The test condition is $V_{DD} = 20V, V_{GS}=10V, L=0.5mH$.
- (4)The power dissipation is limited by 150 $^{\circ}\text{C}$ junction temperature.



Typical Performance Characteristics

Figure 1: Output Characteristics

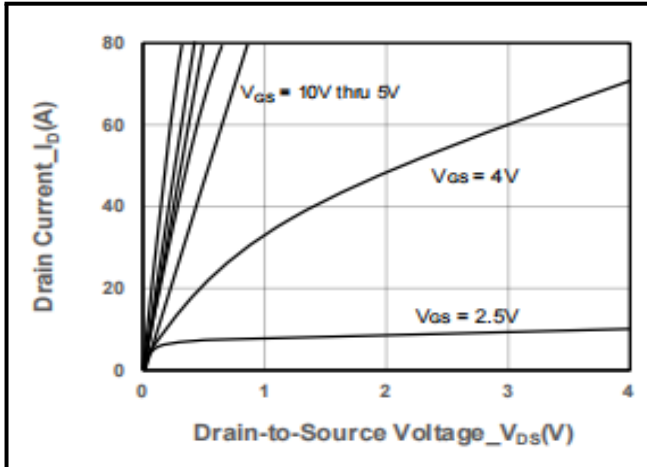


Figure 2: Transfer Characteristics

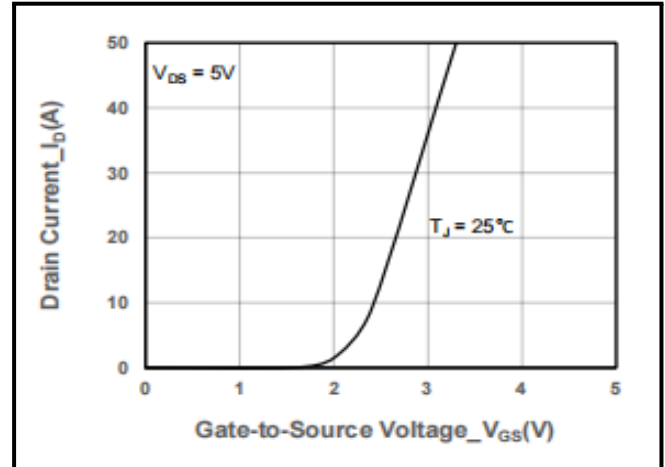


Figure 3: $R_{DS(on)}$ - Drain Current

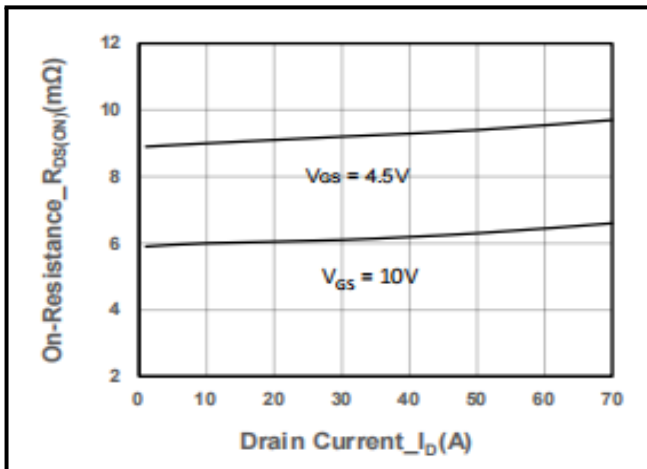


Figure 4: $R_{DS(on)}$ - Gate-Source Voltage

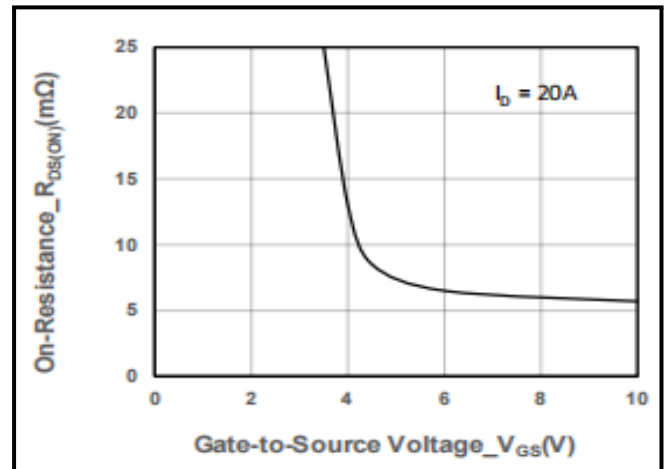


Figure 5: $R_{DS(on)}$ - Junction Temperature

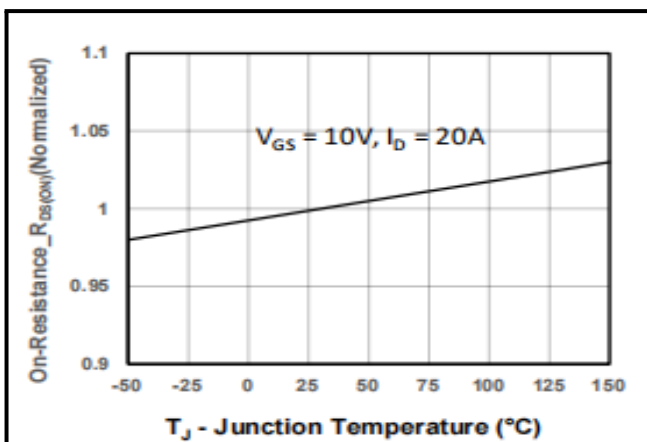
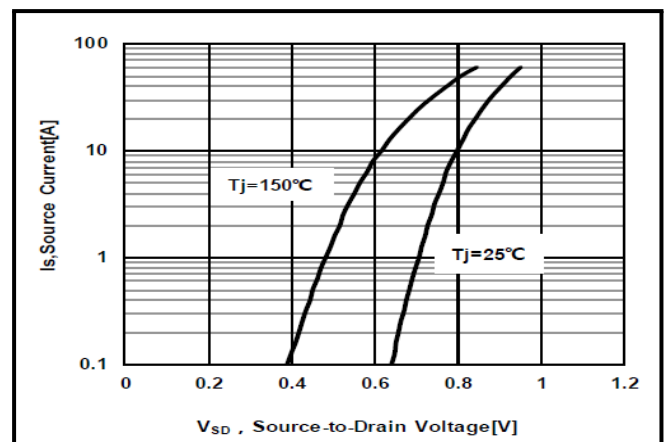


Figure 6: Source- Drain Diode Forward



Typical Performance Characteristics

Figure 7: Normalized Breakdown Voltage vs. T_J

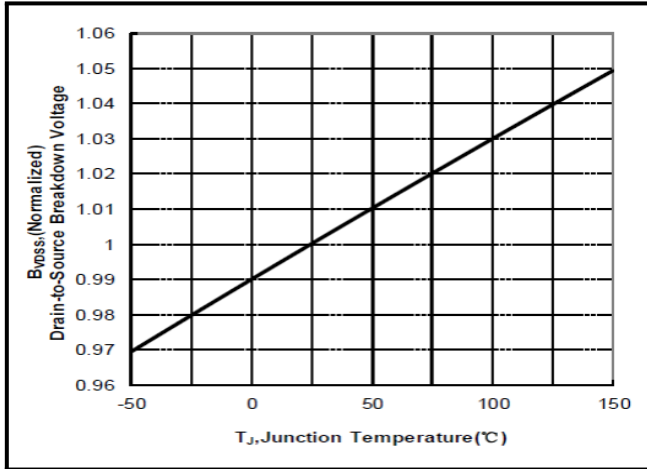


Figure 8: Gate Charge Characteristics

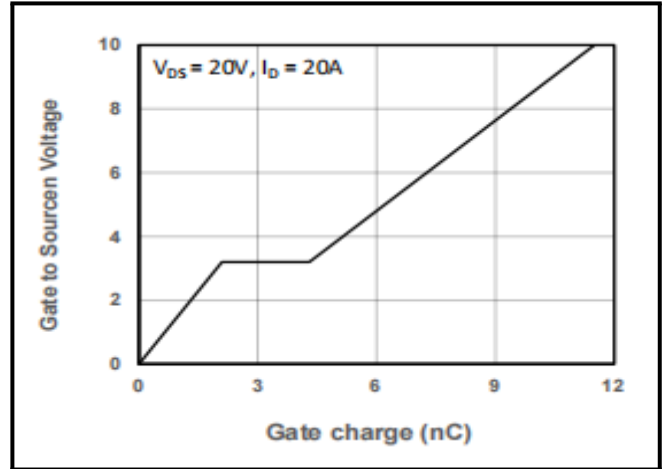


Figure 9: Capacitance vs V_{DS}

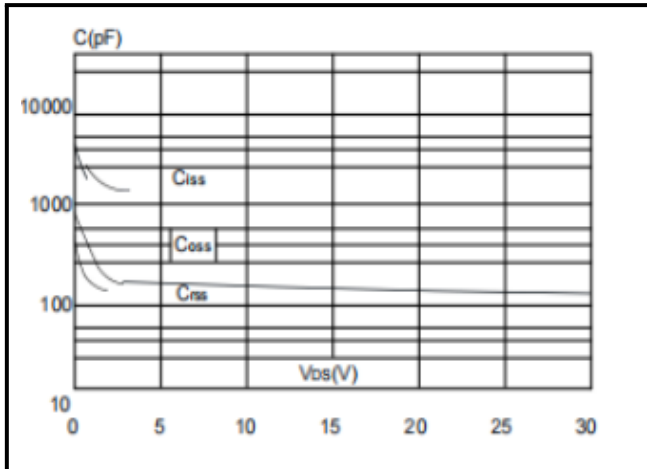


Figure 10: Safe Operation Area

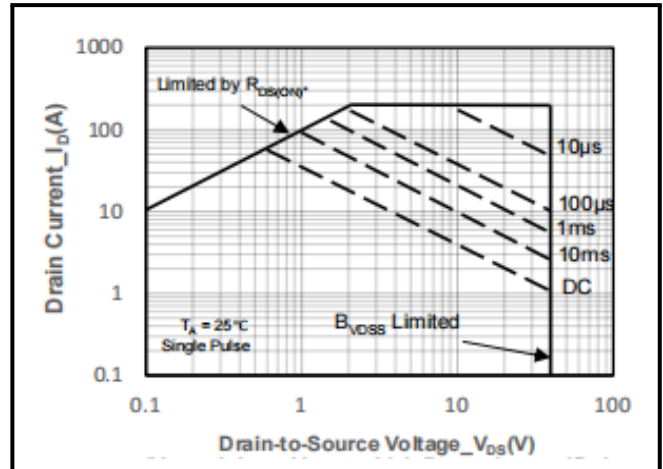


Figure 11: Power Dissipation Derating Curve

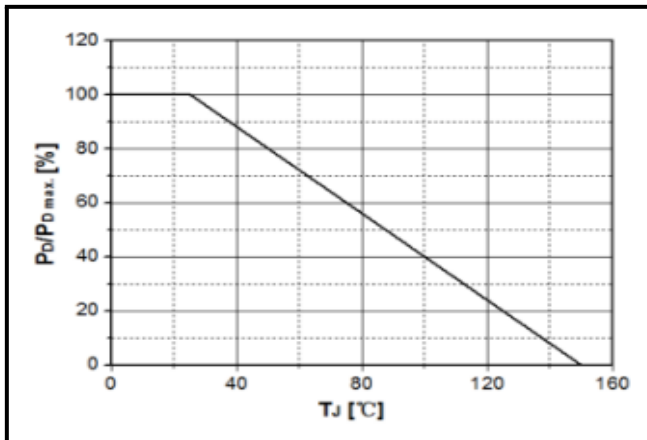
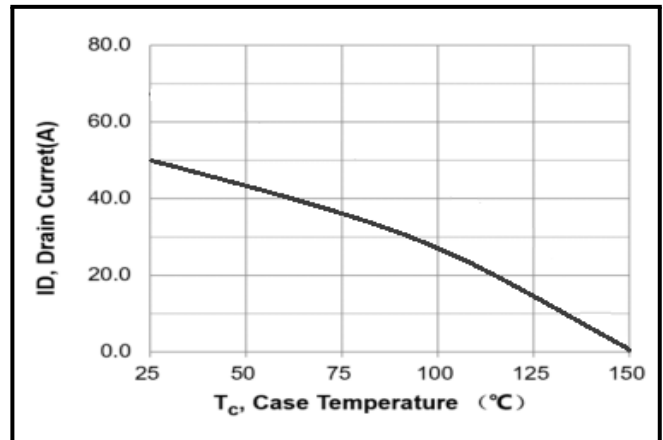
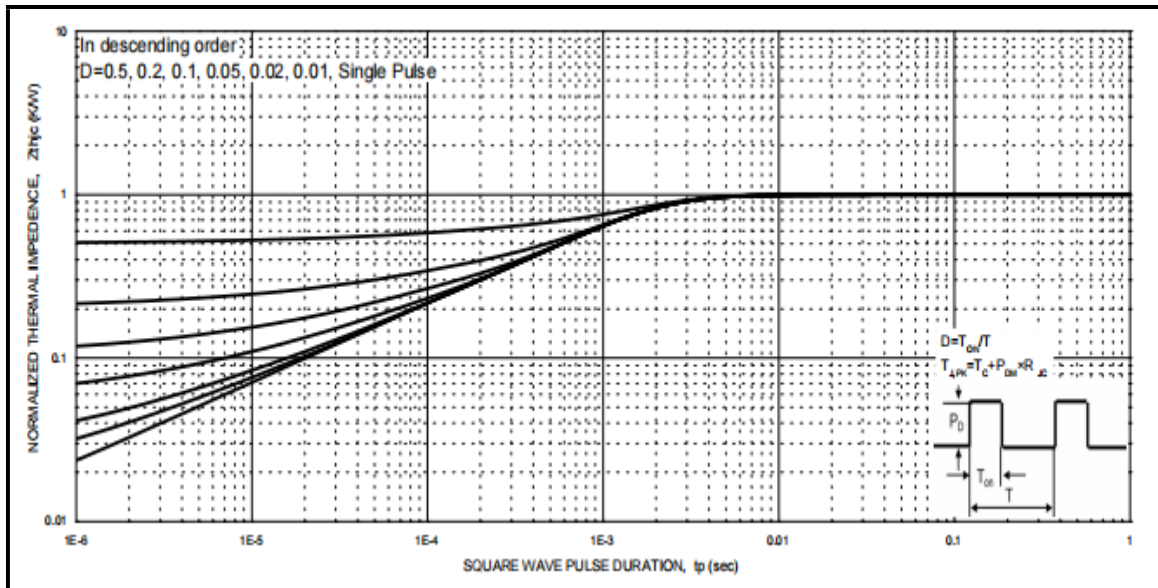


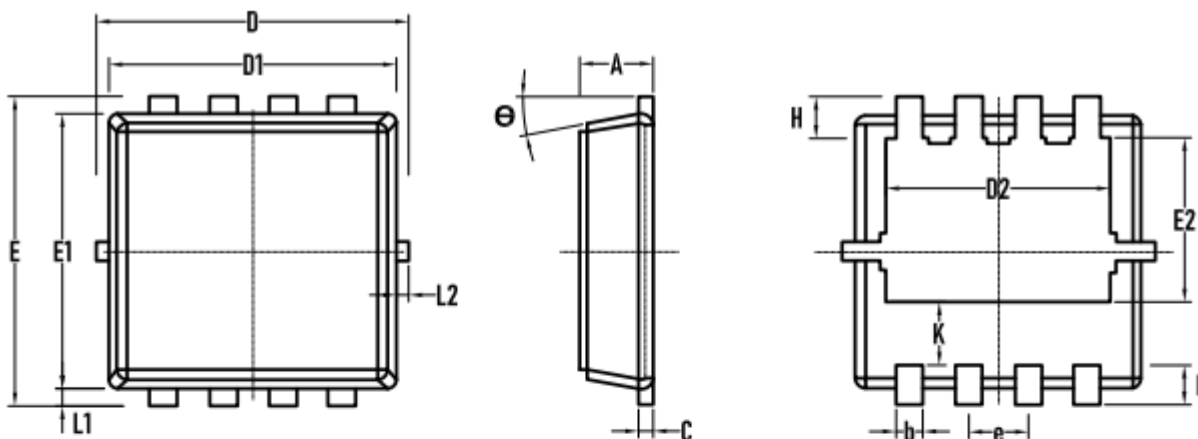
Figure 12: Current Derating



Typical Performance Characteristics

Figure 11: Normalized Maximum Transient Thermal Impedance





SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	0.70	0.80	0.90
b	0.25	0.30	0.39
C	0.14	0.15	0.25
D	3.20	3.30	3.40
D1	3.00	3.15	3.30
D2	2.35	2.45	2.55
e	0.65BSC		
E	3.25	3.35	3.45
E1	2.85	3.00	3.15
E2	1.635	1.735	1.835
H	0.33	0.48	0.63
K	0.585	0.685	0.785
L	0.30	0.40	0.50
L1	0.05	0.15	0.25
L2	-	-	0.15
Θ	8°	10°	12°

