

40V_{DS}/±20V_{GS} N-Channel Enhancement Mode MOSFET

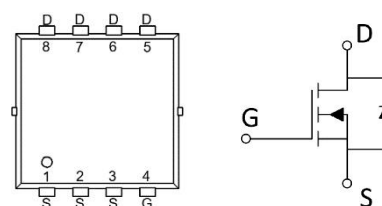
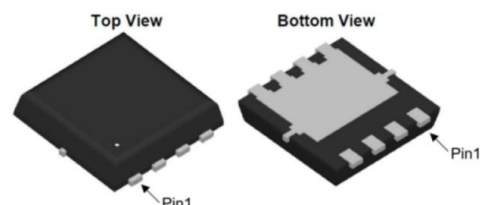
Features

- $V_{DS}=40V, I_D=50A$
- $R_{DS(ON)}=12m\Omega$ (TYP.) $V_{GS}=10V$
- $R_{DS(ON)}=18m\Omega$ (TYP.) $V_{GS}=4.5V$
- Reliable and Rugged
- Avalanche Rated
- Low On-Resistance
- High Current Capability

Applications

- Load Switch
- Power management in portable/desktop PCs
- DC/DC conversion

PDFN3333



Ordering Information

Device	package	Device Marking	Package Qty.
BUK9M11-40E	PDFN3333	*	5000/PCS

Absolute Maximum Ratings (T_C=25°C, unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage (V _{GS} =0V)	V _{DS}	40	V
Gate-Source Voltage (V _{GS} =0V,static)	V _{GS}	±20	V
Continuous Drain Current (T _C =25°C)	I _D	50	A
Continuous Drain Current (T _C =100°C)		26	A
Pulsed Drain Current	I _{DM}	120	A
Single Pulsed Avalanche Energy	E _{AS}	83	mJ
Maximum Power Dissipation (T _C =25°C)	P _D	6.2	W
Maximum Power Dissipation (T _C =100°C)		5.5	W
Operating,Storage Temperature Range	T _J ,T _{STG}	-55~150	°C

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance,Junction-to-Case	R _{θJC}	-	1.8	-	°C / W
Thermal Resistance,Junction-to-Ambient	R _{θJA}	-	62	-	°C / W

Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
Gate -Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.8	3	V
Drain-Source On-stage Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	-	5	10	m Ω
		$V_{GS}=4.5V, I_D=20A$	-	10	20	

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	$V_{DS}=15V$ $V_{GS}=0V$ $f=1MHz$	-	2050	-	pF
Output capacitance	C_{oss}		-	158	-	
Reverse transfer capacitance	C_{rss}		-	120	-	
Gate Resistance	R_g	$f=1MHz$	-	1.5	-	Ω
Total Gate Charge	Q_g	$V_{DS}=15V$ $V_{GS}=10V$ $I_D=20A$	-	15.9	-	nC
Gate Source Charge	Q_{gs}		-	2.9	-	
Gate Drain Charge	Q_{gd}		-	3.3	-	
Turn-on delay Time	$t_{d(on)}$	$V_{GS}=10V$ $V_{DS}=15V$ $R_L=0.75\Omega$ $R_G=3\Omega$	-	6.3	-	ns
Rise time	t_r		-	2.7	-	
Turn-off delay Time	$t_{d(off)}$		-	18.6	-	
Fall time	t_f		-	4.2	-	

Reverse Diode Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Body Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{SD}=1A$	-		1.2	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_{SD}=20A$ $d_i/d_t=500A/\mu s$	-	16	50	ns
Reverse Recovery Charge	Q_{rr}		-	5	20	nC

Electrical Characteristics Diagrames

Figure 1. On-Regin Characteristics

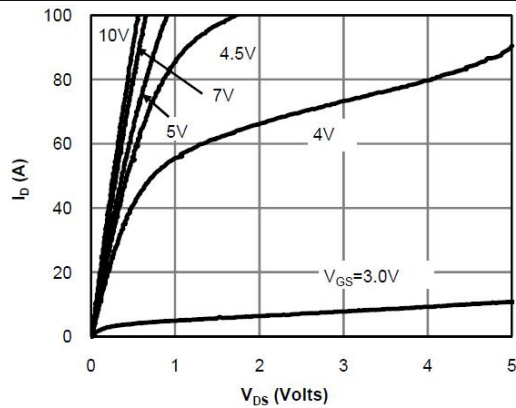


Figure 2. Transfer Characteristics

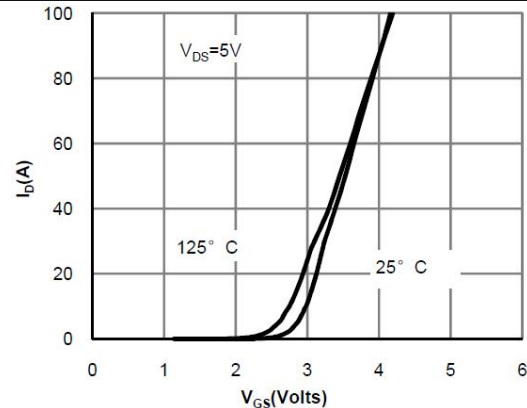


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

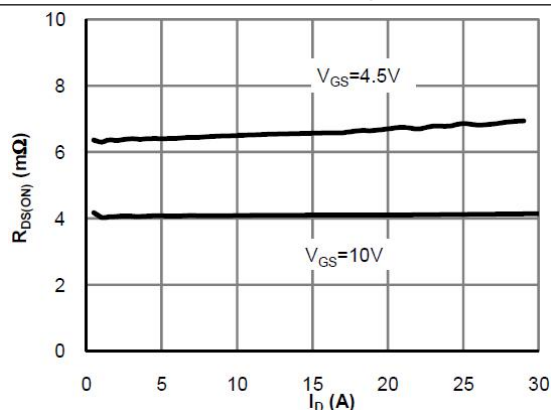


Figure 4. On-Resistance vs. Junction Temperature

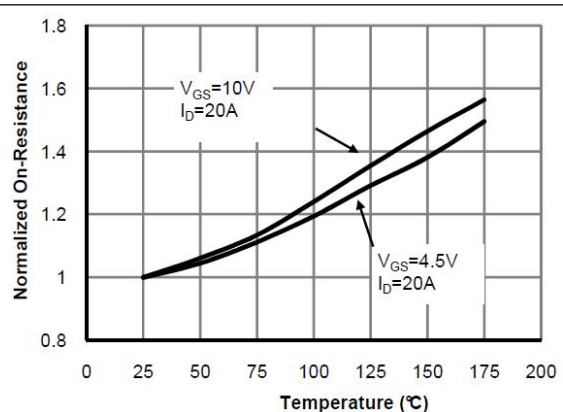


Figure 5. On-Resistance vs. Gate-Source Voltage

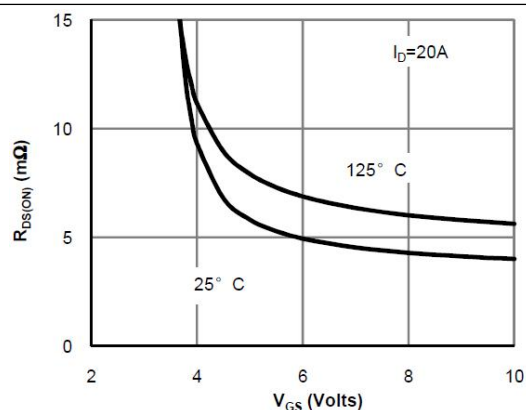


Figure 6. Body-Diode Characteristics

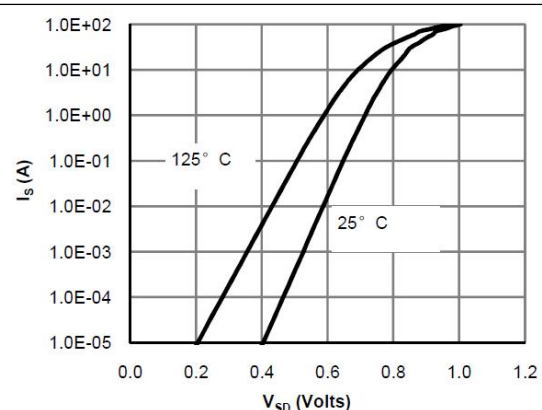


Figure 7. Gate-Charge Characteristics

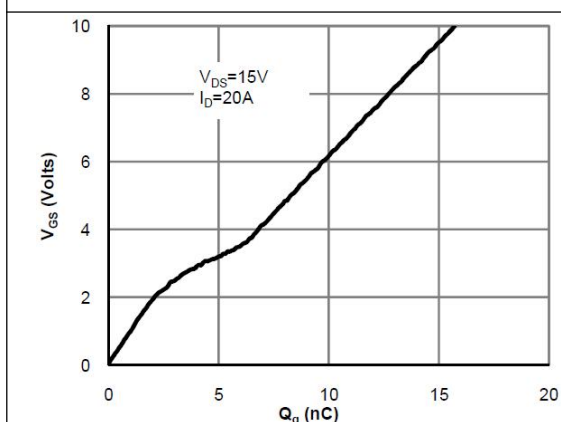


Figure 8. Capacitance Characteristics

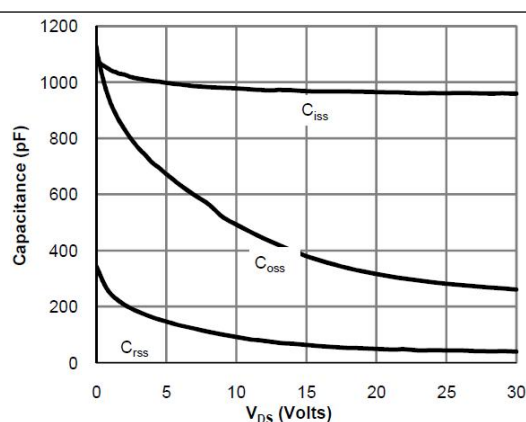


Figure 9. Maximum Forward Biased Safe Operating Area

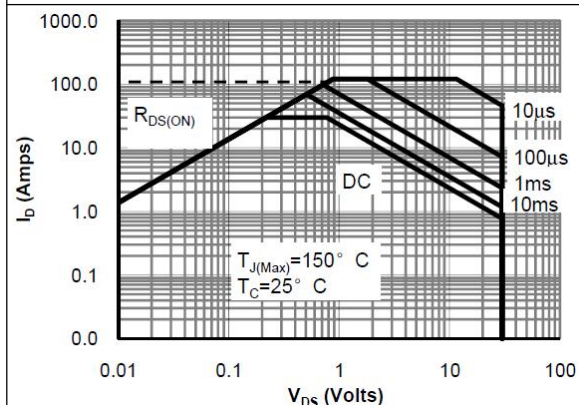


Figure 10. Single Pulse Power Rating Junction-to-Case

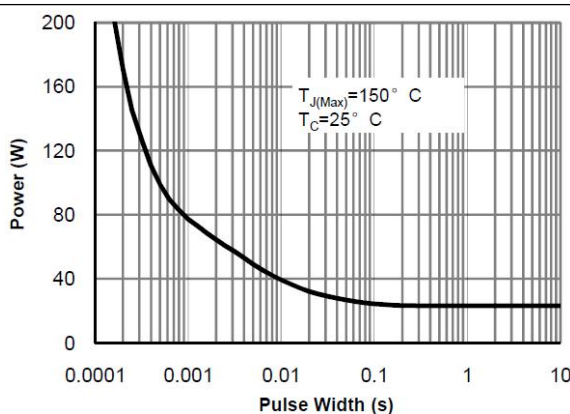


Figure 11. Normalized Maximum Transient Thermal Impedance

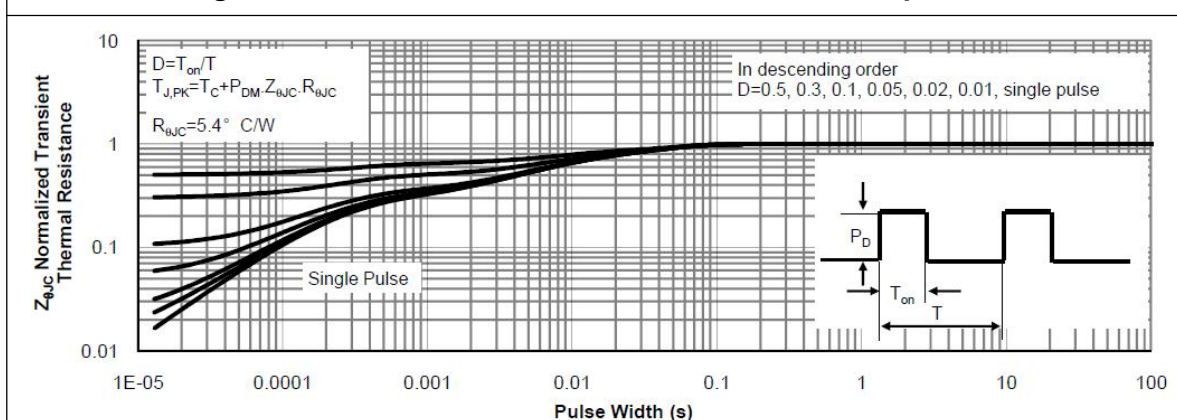


Figure 12. Power De-rating

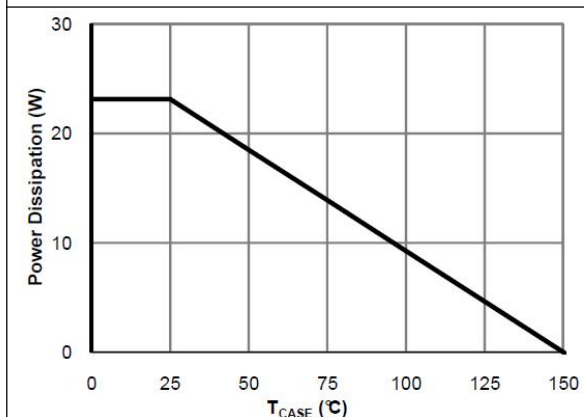


Figure 13. Current De-rating

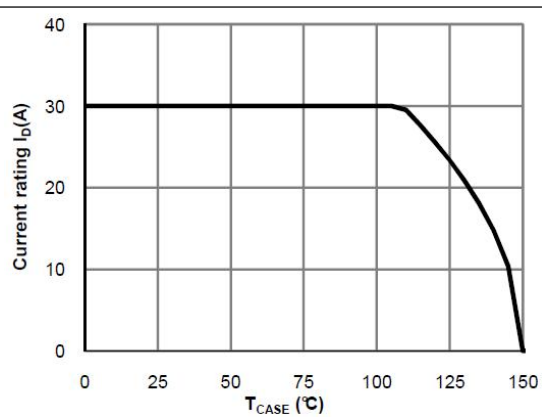


Figure 14. Single Pulse Power Rating Junction-to-Ambient

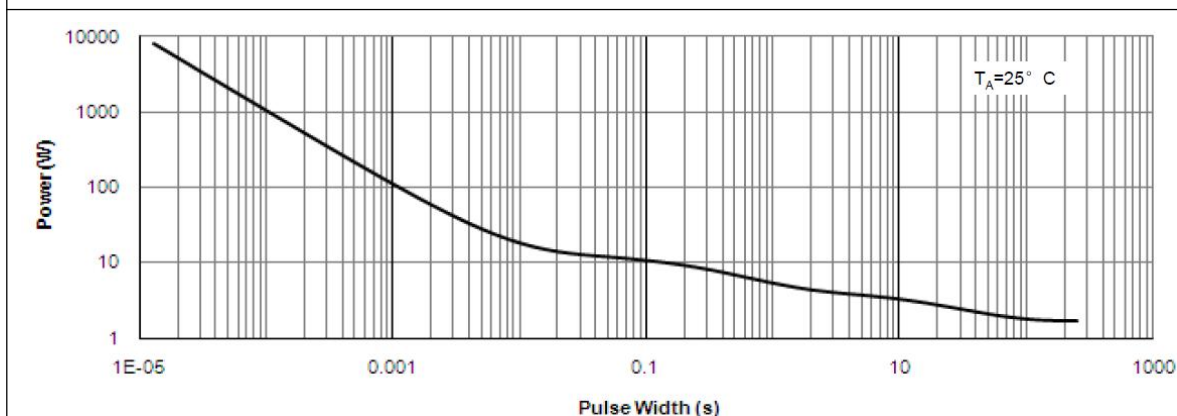
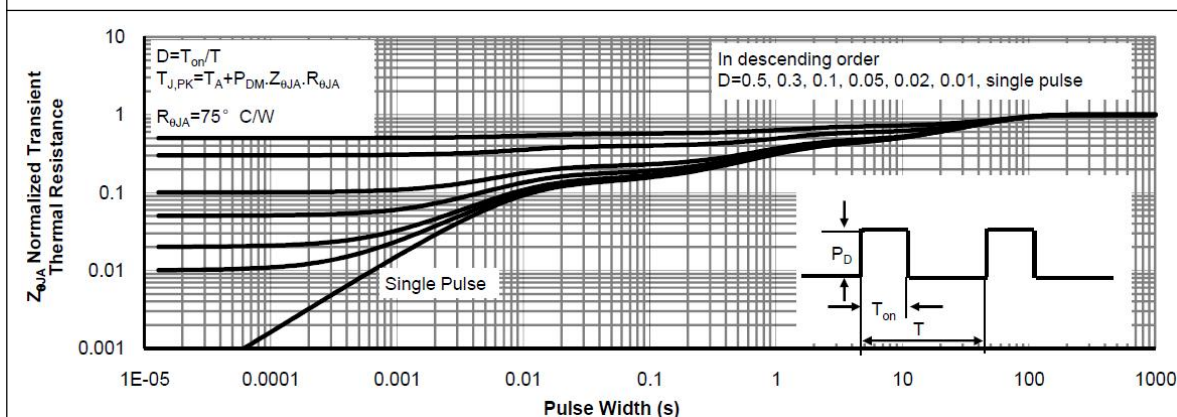
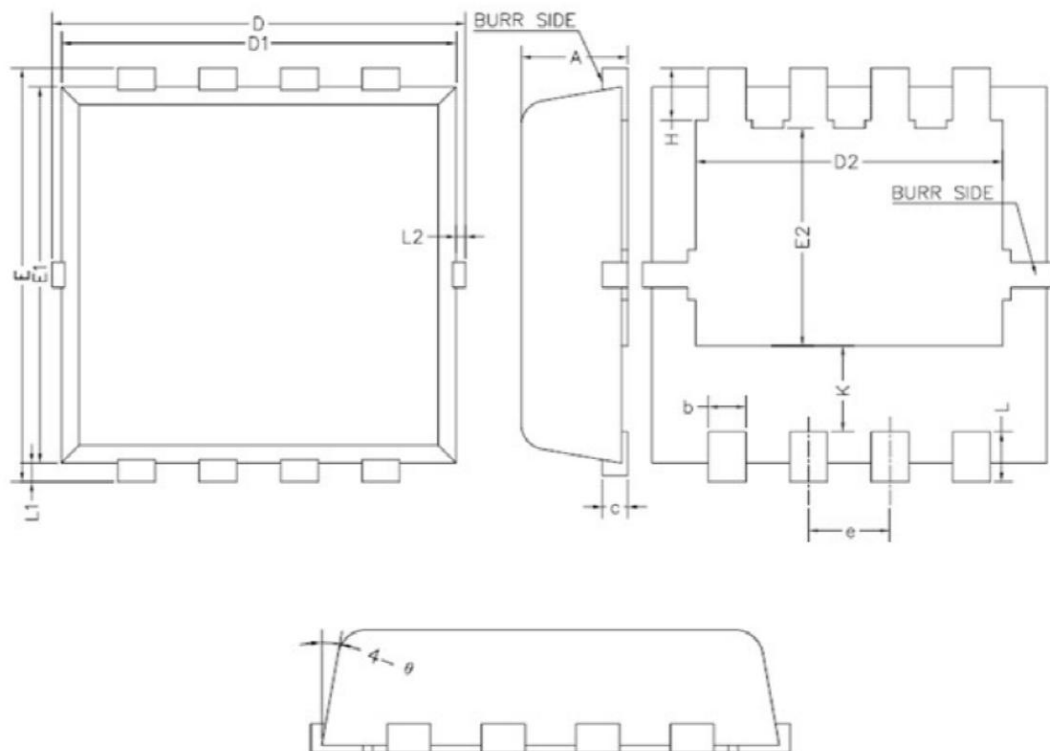


Figure 15. Normalized Maximum Transient Thermal Impedance



Physical Dimensions

PDFN3333



符号	尺寸 (mm)			符号	尺寸 (mm)		
	最小值	典型值	最大值		最小值	典型值	最大值
A	0.70	0.80	0.90	E1	2.90	3.00	3.10
b	0.25	0.30	0.35	E2	1.64	1.74	1.84
c	0.14	0.15	0.20	H	0.32	0.42	0.52
D	3.10	3.30	3.50	K	0.59	0.69	0.79
D1	3.05	3.15	3.25	L	0.25	0.40	0.55
D2	2.35	2.45	2.55	L1	0.10	0.15	0.20
e	0.55	0.65	0.75	L2	-	-	0.15
E	3.10	3.30	3.50	θ	8°	10°	12°

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