

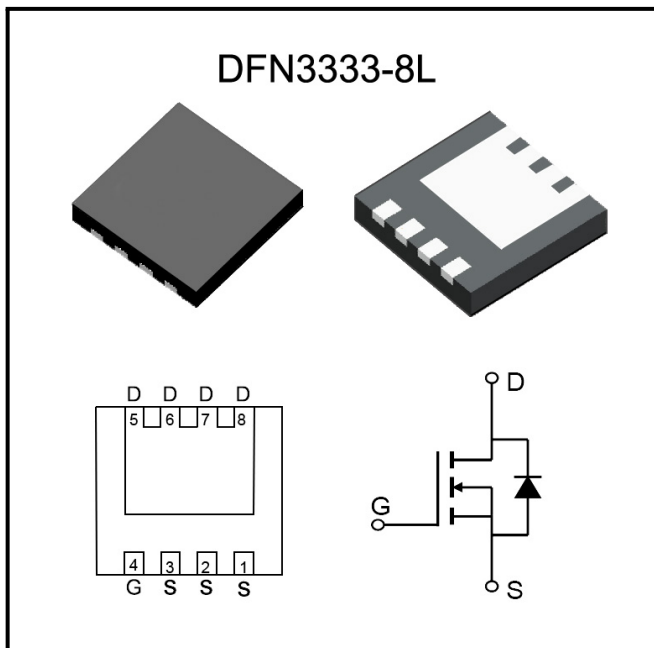
Features

- $V_{DS}=100V, I_D=38A @ V_{GS}=10V$
- $Typ. R_{DS(ON)} = 7.0m\Omega(Typ.) @ V_{GS}=10V$
- $Typ. R_{DS(ON)} = 9.0m\Omega(Typ.) @ V_{GS}=4.5V$
- Ultra-low $R_{DS(on)}$
- Low Gate Charge
- Pb-free Lead Plating
- Halogen-free and RoHS-compliant

Applications

- Power Management in Computing, CE, IE 4.0, Communications
- Current Switching in DC/DC & AC/DC (SR) Sub-systems
- Load Switching, Quick/Wireless Charging, Motor Driving

Package



Ordering Information

Device	Package	Pins	Marking	MSL	$T_j (^\circ C)$	Media	Quantity (pcs)
BMQ100N38	DFN3333-8L	8	BN1008A	1	-55 to 150	13" Reel	5000

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

Symbol	Parameter		Value	Units
V _{DS}	Drain-Source Voltage		100	V
V _{GS}	Gate - Source Voltage		±20	
I _D	Drain Current ¹	T _C =25°C	38	A
		T _C =100°C	25	
I _{DM}	Drain Current-Pulse ²		132	A
I _{AS}	Avalanche Current ³		29	A
E _{AS}	Avalanche Energy ³		122	mJ
P _D	Power Dissipation ⁴	T _C =25°C	23	W
		T _C =100°C	9.3	
T _J , T _{stg}	Junction Storage Temperature Range		-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Units
Thermal Resistance from Junction to Case	$R_{\theta JC}$	4.5	5.4	$^\circ C/W$
Thermal Resistance From Junction to Ambient(Note3)	$R_{\theta JA}$	60	75	



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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D=250\mu A$	100	—	—	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80V, T_J=25^\circ\text{C}$	—	—	1	μA
		$V_{GS}=0V, T_J=55^\circ\text{C}$	—	—	5	
Gate- Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS}=0V$	—	—	± 100	nA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_{DS}=250\mu A$	1.2	1.8	2.5	V
Static Drain-source On Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$	—	7.0	9.0	m Ω
		$V_{GS}=4.5V, I_D=15A$	—	9.0	11.5	
Forward Transconductance	g_{FS}	$V_{DS}= 5V, I_D= 20A$	—	82	—	S
Diode Forward Voltage	V_{SD}	$I_S= 1A, V_{GS}= 0V$	—	0.70	1.0	V
Diode Continuous Current	I_S	$T_C=25^\circ\text{C}$	—	—	23	A
DYNAMIC PARAMETERS ⁵						
Input capacitance	C_{iss}	$V_{DS} = 50V,$ $V_{GS} = 0V,$ $f = 1\text{MHz}$	—	2200	—	PF
Output capacitance	C_{oss}		—	445	—	
Reverse transfer capacitance	C_{rss}		—	8	—	
Gate Resistance	R_g	$V_{GS} = 0V, V_{DS}= 0V, f = 1\text{MHz}$	—	2	—	Ω
SWITCHING PARAMETERS ⁵						
Total Gate Charge	Q_g	$V_{DS}=50V,$ $V_{GS}=0 \text{ to } 10V,$ $I_D=20A$	—	34	—	nC
Total Gate Charge	Q_g		—	17	—	
Gate to Source Charge	Q_{gs}		—	5.5	—	
Gate to Drain Charge	Q_{gd}		—	5.7	—	
Turn-on delay time	$T_{d(on)}$	$V_{DS}=50V,$ $V_{GS}=10V,$ $R_G=6\Omega, R_L=2.5\Omega$	—	13	—	nS
Turn-on Rise time	T_r		—	14	—	
Turn -Off Delay Time	$T_{d(off)}$		—	29	—	
Turn -Off Fall time	T_f		—	17	—	
Reverse Recovery Time	T_{rr}	$I_F = 15A,$ $di/dt=100A/\mu s$	—	49	—	nS
Reverse Recovery Charge	Q_{rr}		—	43	—	nC

Note:

- (1)Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
- (2)This single-pulse measurement was taken under $T_{J_Max}= 150^\circ\text{C}=150^\circ\text{C}$.
- (3) This single-pulse measurement was taken under the following condition [$L = 100\mu H, V_{GS}=10V, V_{DS} = 100V$] while its value is limited by $T_{J_Max}= 150^\circ\text{C}$.
- (4)The power dissipation PD is based on $T_{J_Max}=150^\circ\text{C}$.
- (5)This value is guaranteed by design hence it is not included in the production test.



Typical Performance Characteristics

Figure 1: $R_{DS(on)}$ vs. V_{GS}

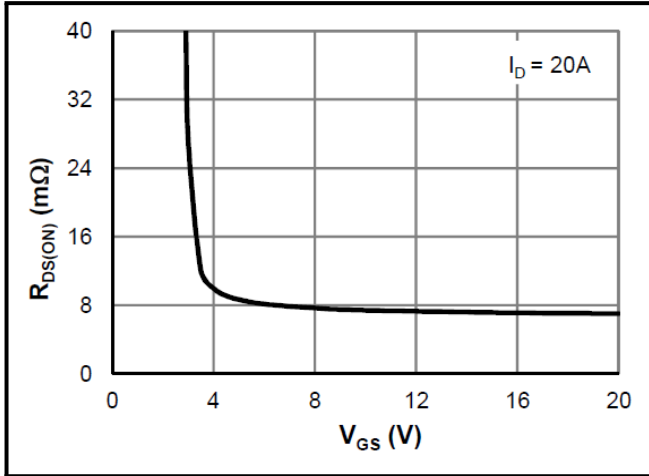


Figure 2: Gate Charge

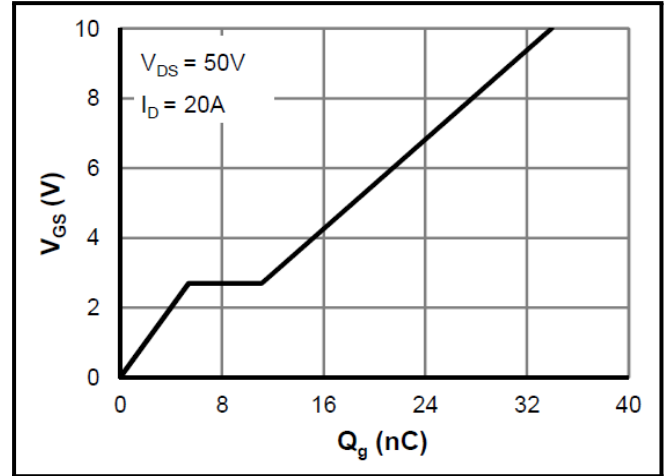


Figure 3: Saturation Characteristics

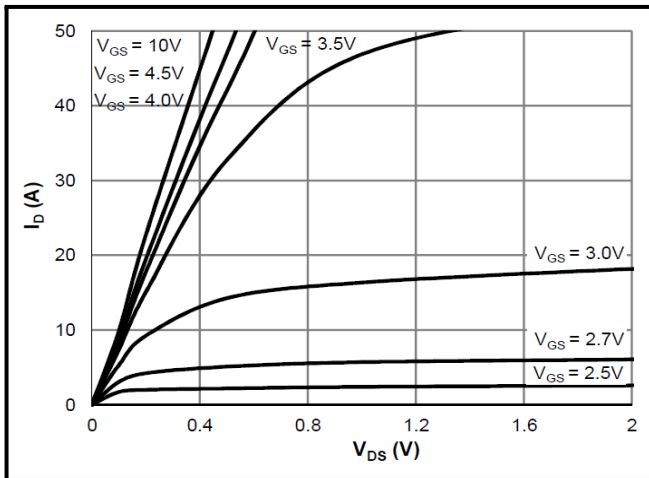


Figure 4: Transfer Characteristics

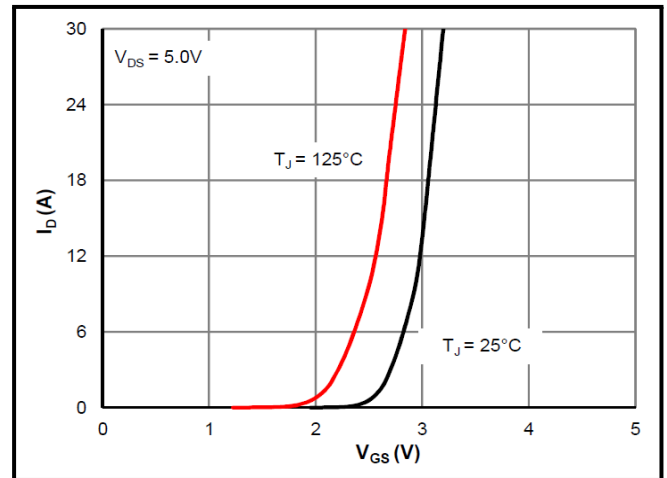


Figure 5: $R_{DS(on)}$ vs. Drain Current

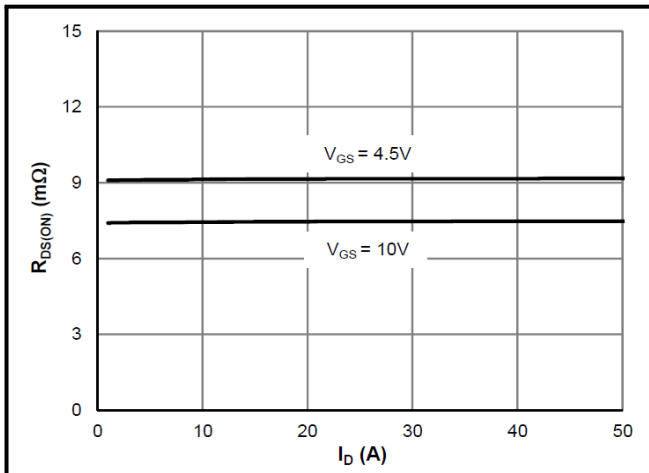
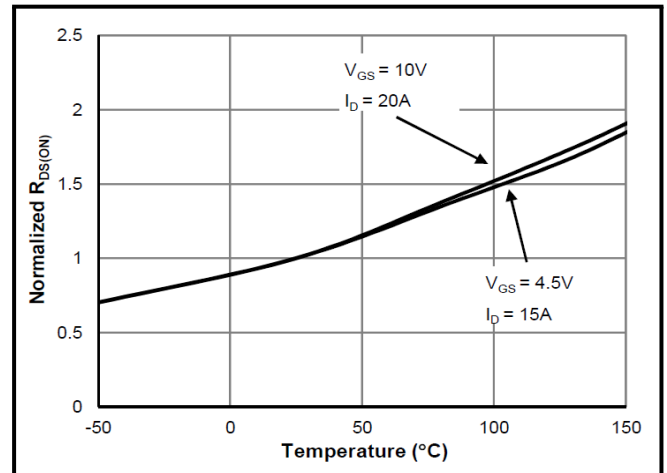


Figure 6: $R_{DS(on)}$ vs. Junction Temperature



Typical Performance Characteristics

Figure 5: Body-Diode Characteristics

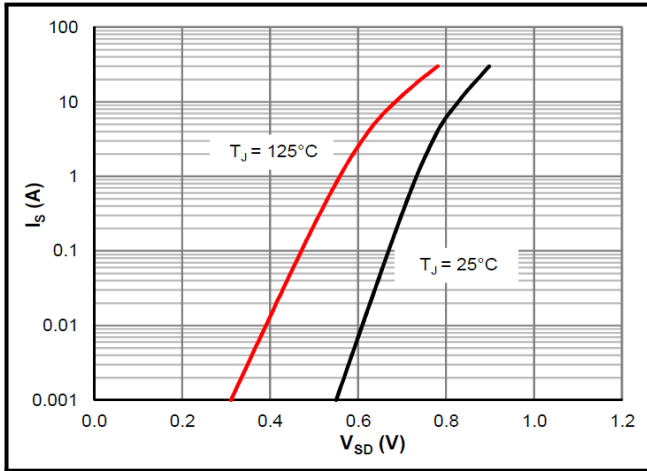


Figure 6: Capacitance Characteristics

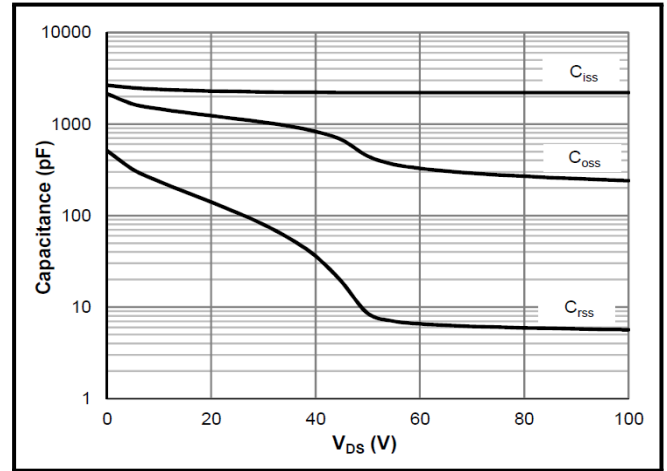


Figure 7: Current De-rating

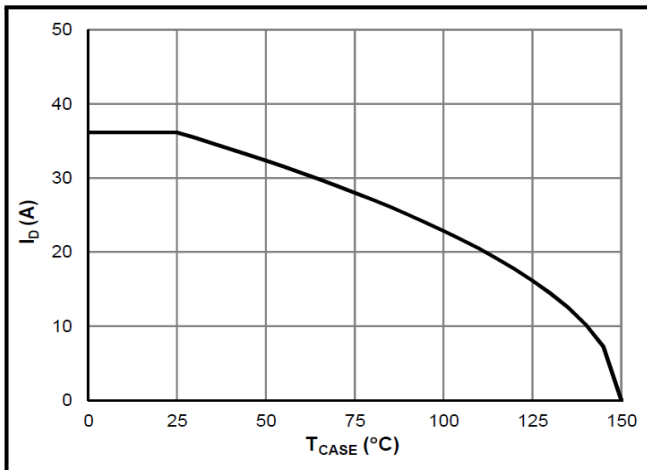


Figure 8: Power De-rating

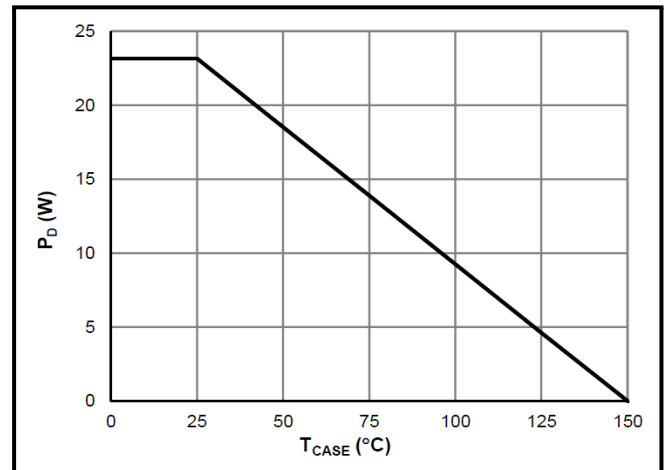


Figure 9: Maximum Forward Biased Safe Operating Area

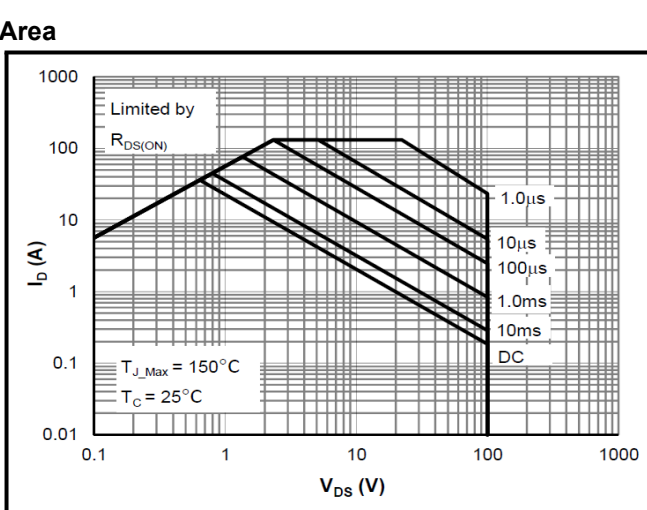
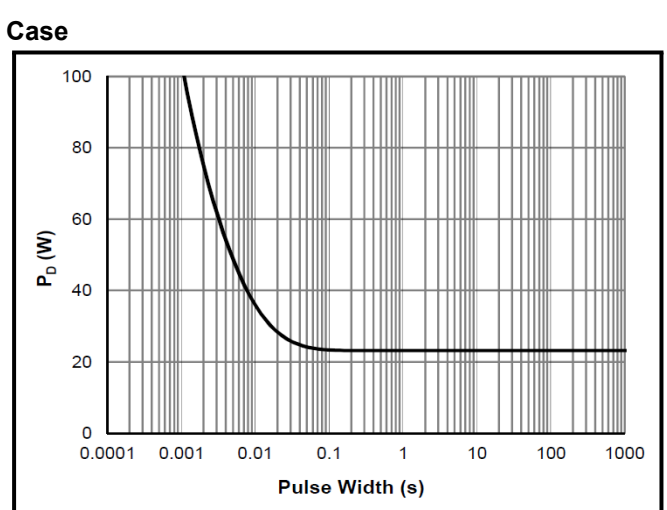
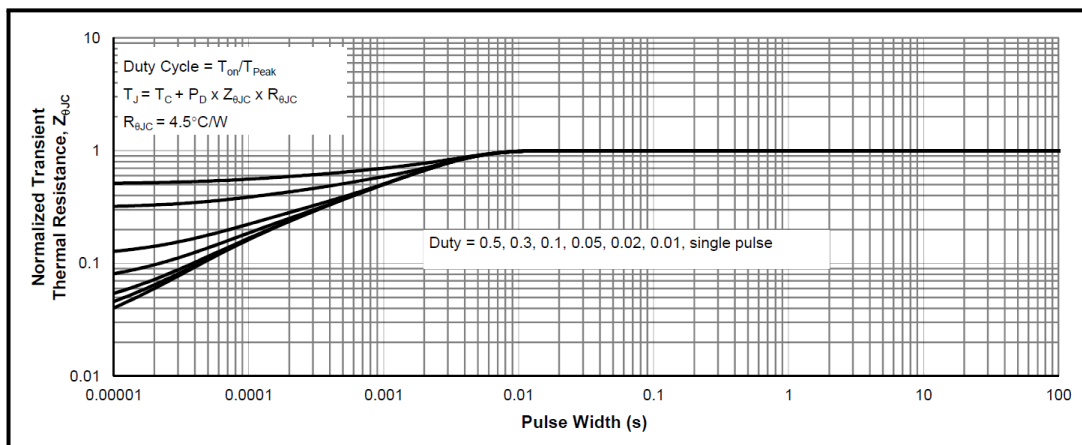


Figure 10: Single Pulse Power Rating, Junction-to-Case

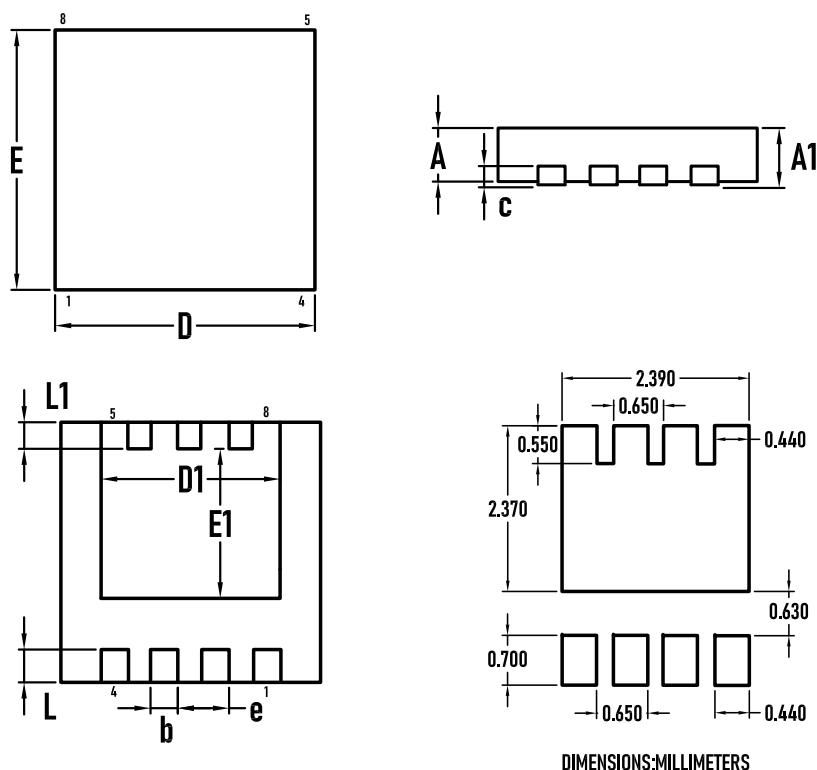


Typical Performance Characteristics

Figure 11: Normalized Maximum Transient Thermal Impedance



Packaging Tap – DFN3333-8L



SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	0.70	0.75	0.80
A1	—	—	0.05
b	0.29	0.34	0.39
c	—	0.20	—
D	3.20	3.30	3.40
D1	2.19	2.29	2.39
E	3.20	3.30	3.40
E1	1.62	1.72	1.82
L	0.35	0.45	0.55
L1	0.30	0.40	0.50
e	0.65BSC		

