

BMQ03N850

30V N-channel MOSFET

Features

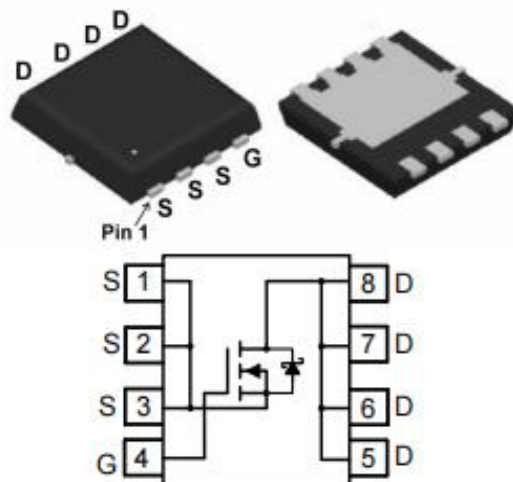
- Fast Switching
- Low $R_{DS(on)}$
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested

Application

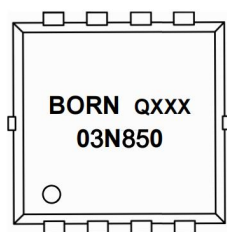
- SMPS and general purpose applications
- Hard switched and high frequency circuits
- PD

Package

PDFN3.3*3.3



Marking



Ordering information

Order code	Package	Marking	Base qty	Delivery mode
BMQ03N850	PDFN3.3*3.3	03N850	5K	Tape and reel

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

Symbol	Parameter		Value	Units
V_{DS}	Drain-Source Voltage		30	V
V_{GS}	Gate - Source Voltage		± 20	
I_D	Drain Current ¹	$T_C=25^{\circ}\text{C}$	30	A
		$T_C=100^{\circ}\text{C}$	20	
I_{DM}	Drain Current-Pulse		120	A
E_{AS}	Single Pulse Avalanche Energy ²		42	mJ
P_D	Power Dissipation	$T_C=25^{\circ}\text{C}$	39	W



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

Symbol	Parameter	Value	Units
T_J	Junction Temperature(Max)	150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	-55 to +150	
$R_{\Theta\text{JC}}$	Thermal Resistance from Junction to Case	3.15	$^{\circ}\text{C/W}$
$R_{\Theta\text{JA}}$	Thermal Resistance, Junction to Ambient	49.18	

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250uA	30	–	–	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30V, V _{GS} =0V	–	–	1	uA
Gate- Source Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V	–	–	±100	nA
On Characteristics ³						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _{DS} =250uA	1	1.5	2	V
Static Drain-source On Resistance	R _{DS(on)}	V _{GS} =10V, I _D =25A	–	6.2	7.8	mΩ
		V _{GS} =4.5V, I _D =15A	–	9.5	14	mΩ
Dynamic Characteristics						
Input capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f = 1MHz	–	1070	–	pF
Output capacitance	C _{oss}		–	160	–	
Reverse transfer capacitance	C _{rss}		–	135	–	
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =20A	12	–	–	S
Switching Characteristics						
Turn-on delay time	T _{d(on)}	V _{DD} =15V, V _{GS} =10V, I _D =15A, R _G =3Ω	–	3	–	nS
Turn-on Rise time	T _r		–	4	–	
Turn -Off Delay Time	T _{d(off)}		–	24	–	
Turn -Off Fall time	T _f		–	14	–	
Gate to Source Charge	Q _{gs}	V _{DS} =15V, V _{GS} =10V, I _D =15A	–	2.5	–	nC
Gate to Drain Charge	Q _{gd}		–	2.1	–	
Gate to Drain Charge	Q _g		–	18.3	–	
Source - Drain Diode Characteristics						
Diode Forward Voltage ⁴	V _{SD}	V _{GS} =0V,I _S =30A	–	–	1.2	V
Reverse Recovery Time	t _{rr}	I _F =30A, di/dt=100A/us	–	13	–	nS
Reverse Recovery Charge	Q _{rr}		–	5	–	nC

Notes:(1) The maximum current rating is limited by package.And device mounted on a large heatsink

(2) $V_{\text{DD}}=20\text{V}$, $L = 0.5\text{mH}$, $R_{\text{G}} = 25\Omega$ Starting $T_J = 25^{\circ}\text{C}$.

(3)Pulse Test : Pulse Width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.



Electrical Characteristics

Figure 1: Output Characteristics

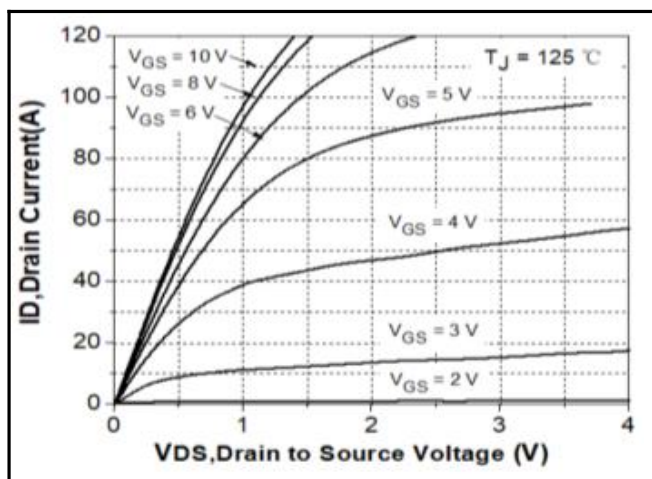


Figure 2: Transfer Characteristics

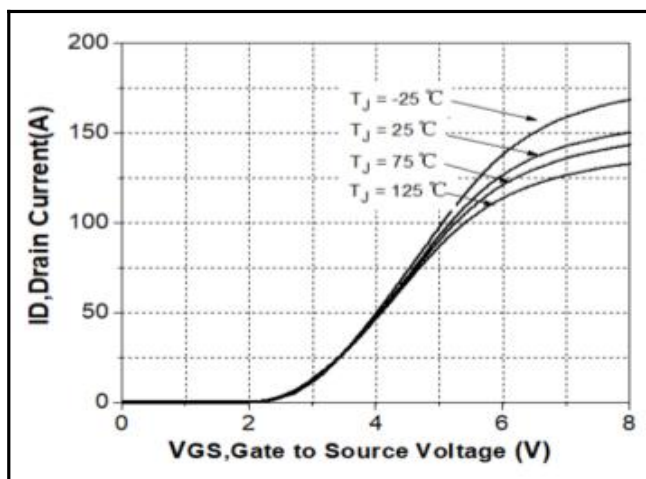


Figure 3: $R_{DS(ON)}$ vs I_D $T_J = 25^\circ\text{C}$

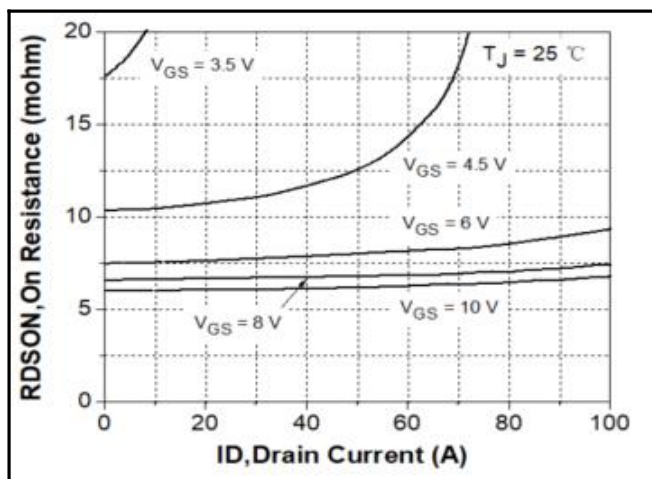


Figure 4: R_{DS} vs I_D $T_J = 125^\circ\text{C}$

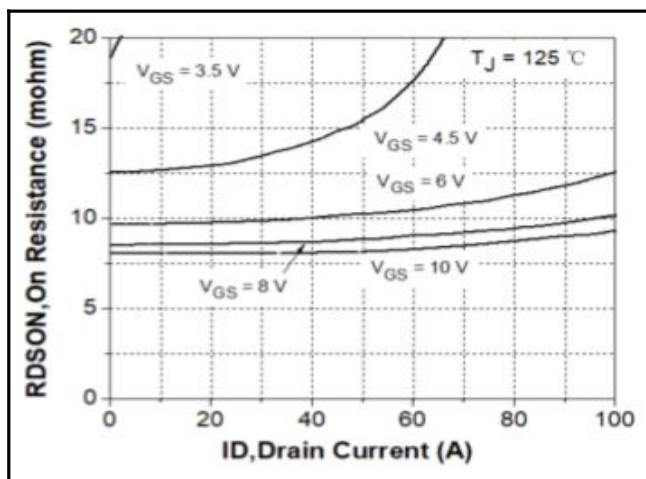


Figure 5: I_S vs V_{SD}

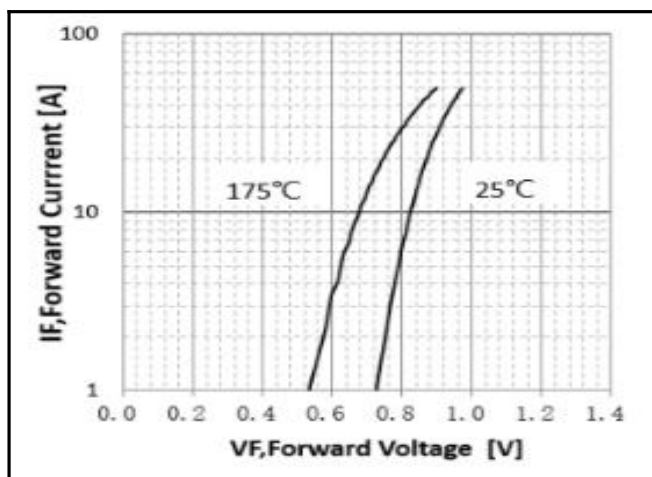
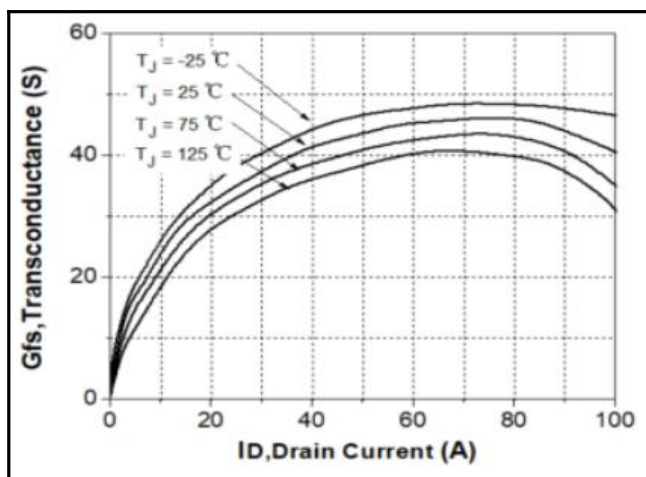


Figure 6: Transconductance vs Drain Current



Electrical Characteristics

Figure 7: Gate Charge Characteristics

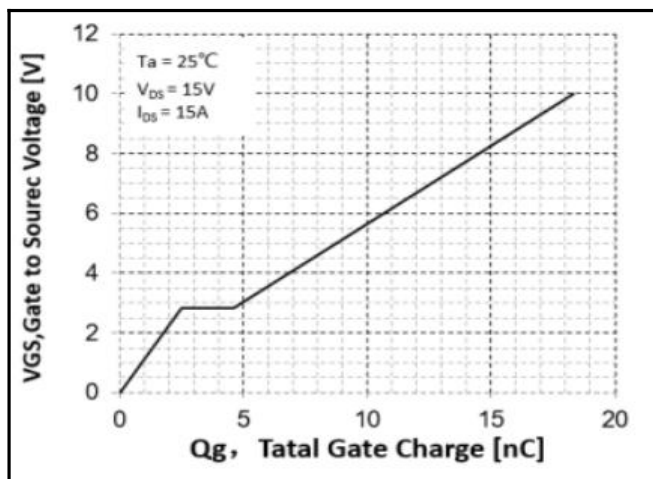


Figure 8: Power Dissipation Derating Curve

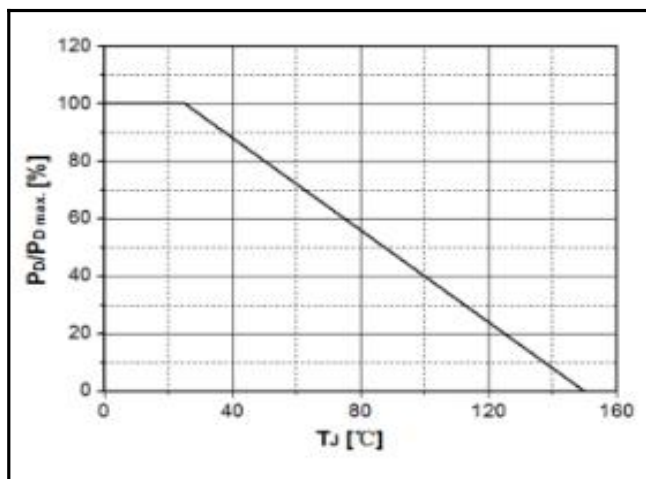


Figure 9: Capacitance vs VDS

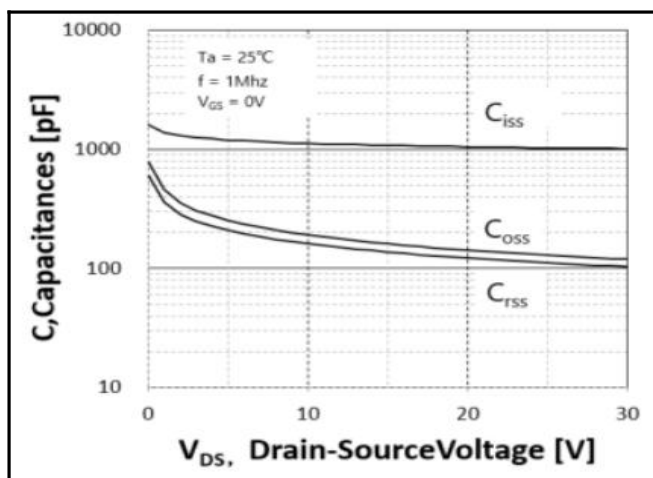


Figure 10: Safe Operation Area

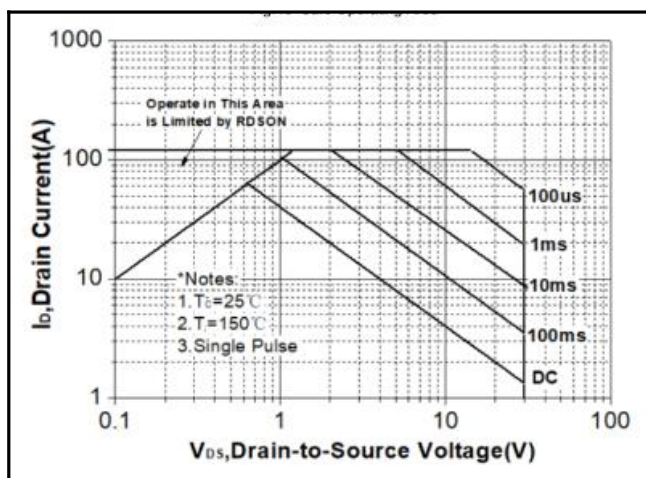
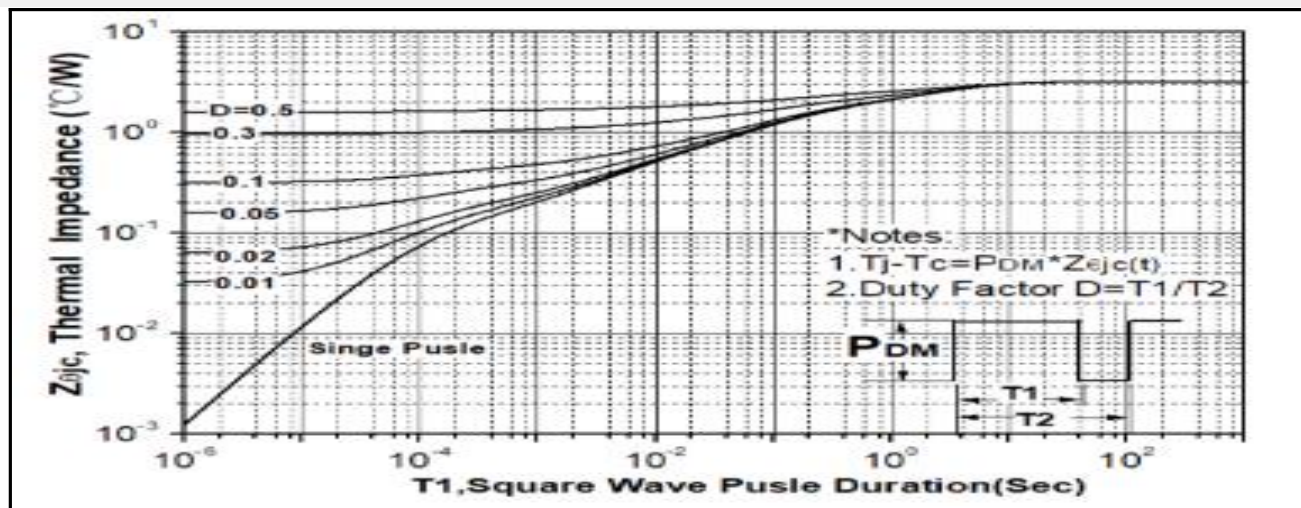


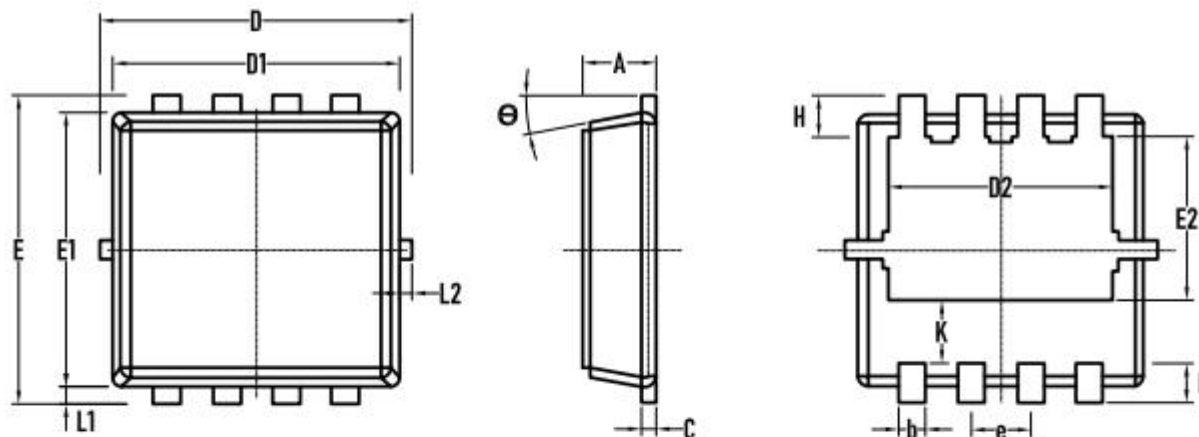
Figure 11: Normalized Transient Thermal Impedance vs Pulse Width



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Packaging Tape -PDFN3.3*3.3



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°

