

BMT010N140

100V N-channel MOSFET

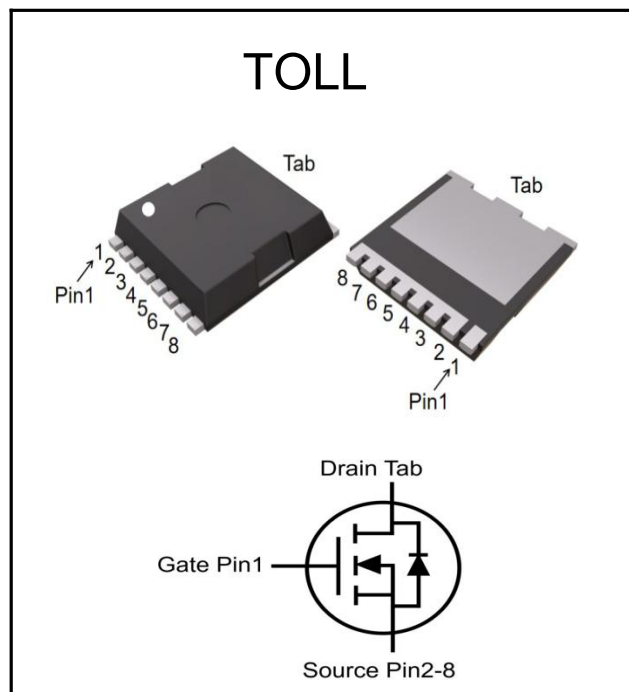
Features

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

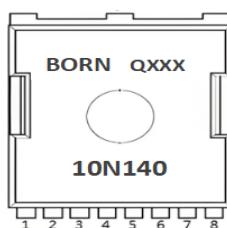
Application

- Battery management
- Power Switching Application
- Motor Control
- UPS
- BMS

Package



Marking



Ordering information

Order code	Package	Marking	Base qty	Delivery mode
BMT010N140	TOLL	10N140	2K	Tape and reel

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

Symbol	Parameter		Value	Units
V_{DS}	Drain-Source Voltage		100	V
V_{GS}	Gate - Source Voltage		± 20	
I_D	Drain Current	$T_C=25^{\circ}\text{C}$	326	A
		$T_C=100^{\circ}\text{C}$	204	
I_{DM}	Drain Current-Pulse		1244	A
E_{AS}	Single Pulse Avalanche Energy		1568	mJ
P_D	Power Dissipation	$T_C=25^{\circ}\text{C}$	250	W



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Symbol	Parameter	Value	Units
T_J	Junction Temperature(Max)	150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	-55 to +150	
$R_{\theta JC}$	Thermal Resistance from Junction to Case	0.5	$^{\circ}\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	45	

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	100	108	–	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 100V, V _{GS} =0V	–	–	10	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	2	3	4	V
Static Drain-source On Resistance	R _{DS(on)}	V _{GS} =10V, I _D =40A	–	1.15	1.4	mΩ
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =40A	–	100	–	S
Dynamic Characteristics						
Input capacitance	C _{iss}	V _{DS} =40V, V _{GS} =0V, f = 1MHz	–	12540	–	pF
Output capacitance	C _{oss}		–	3850	–	
Reverse transfer capacitance	C _{rss}		–	153	–	
Gate Resistance	R _g	V _{GS} = V _{DS} =0V, f = 1MHz	–	1.5	–	Ω
Switching Characteristics						
Turn-on delay time	T _{d(on)}	V _{DD} =50V, V _{GS} =10V, I _D =40A, R _G =1.6Ω	–	25	–	nS
Turn-on Rise time	T _r		–	65	–	
Turn -Off Delay Time	T _{d(off)}		–	60	–	
Turn -Off Fall time	T _f		–	33	–	
Gate to Source Charge	Q _{gs}	V _{DS} =50V, V _{GS} =10V, I _D =40A	–	51	–	nC
Gate to Drain Charge	Q _{gd}		–	32	–	
Gate to Drain Charge	Q _g		–	161	–	
Source - Drain Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =40A	–	0.8	1.2	V
Reverse Recovery Time	t _{rr}	I _F =100A, di/dt=100A/us	–	49	–	nS
Reverse Recovery Charge	Q _{rr}		–	435	–	nC

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

(2) $V_{DS}=50V, L = 5\text{ mH}, R_G = 25\Omega$ Starting $T_J = 25^{\circ}\text{C}$.

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



Electrical Characteristics

Figure 1: Output Characteristics

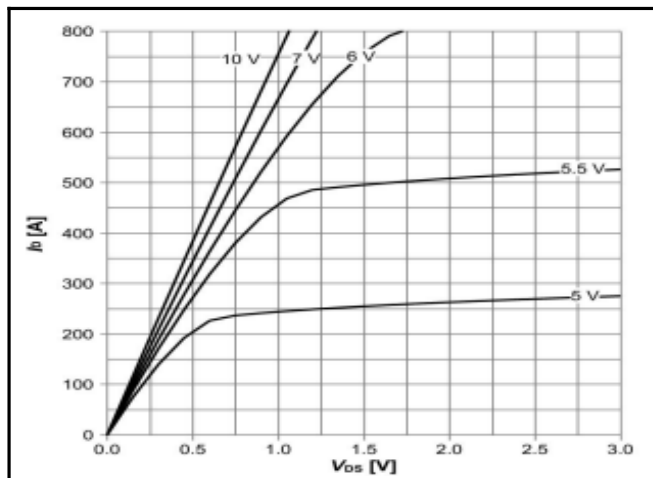


Figure 2: Transfer Characteristics

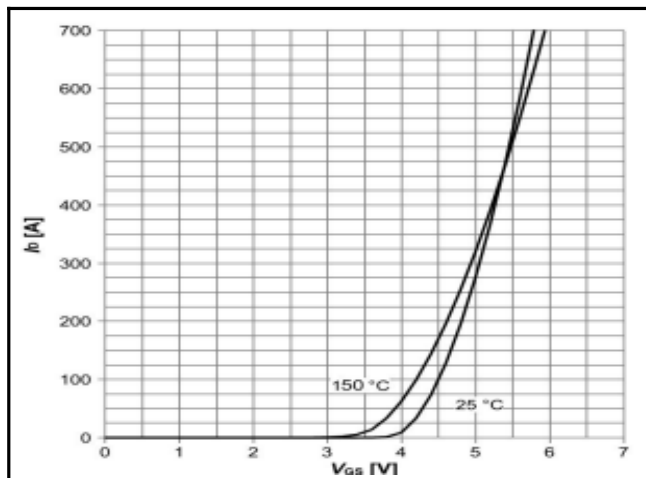


Figure 3: $R_{DS(ON)}$ vs I_D

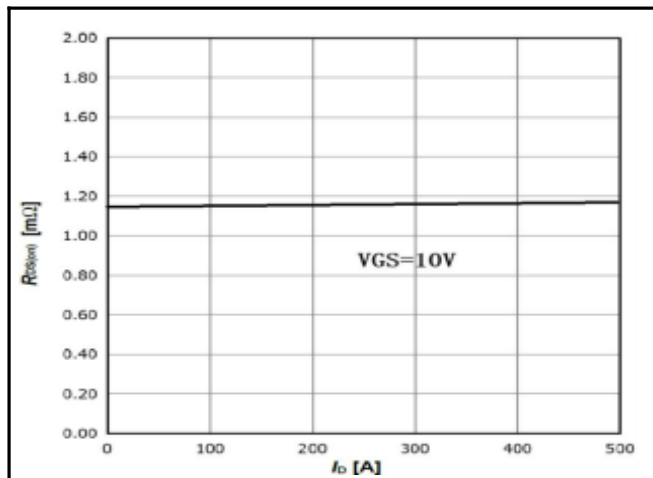


Figure 4: $R_{DS(ON)}$ vs Gate Voltage

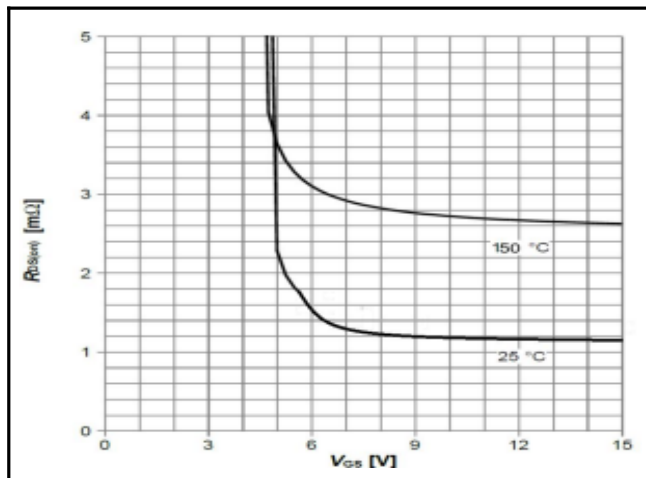


Figure 5: I_S vs V_{SD}

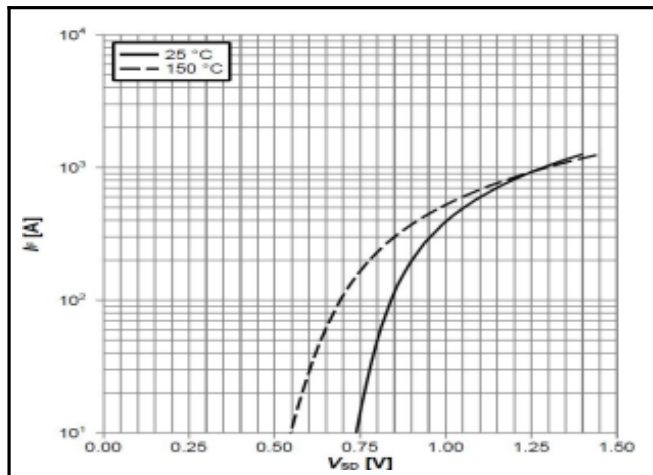
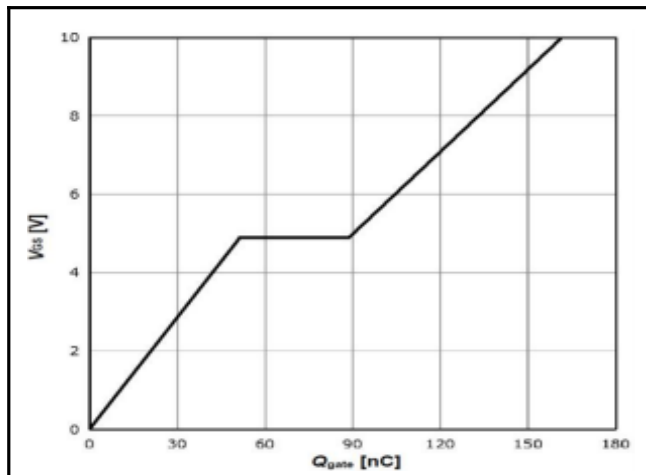


Figure 6: Gate charge



Electrical Characteristics

Figure 7: Power De-rating

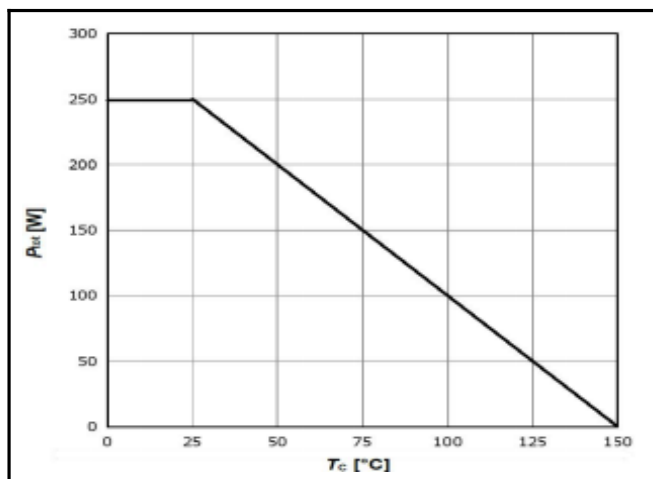


Figure 8: Current De-rating

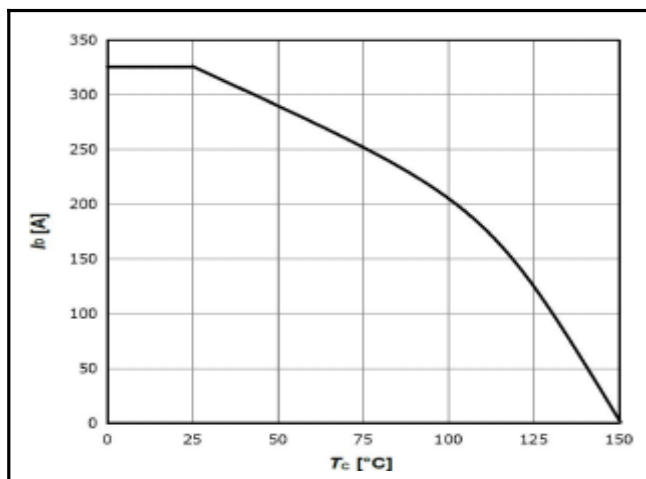


Figure 9: Capacitance vs V_{DS}

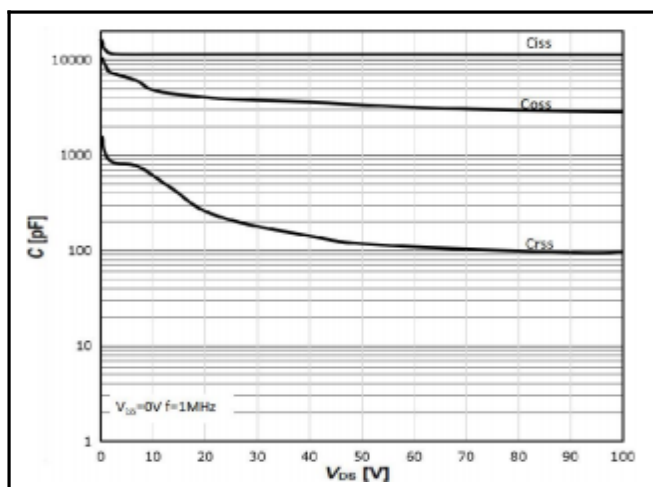


Figure 10: Safe Operation Area

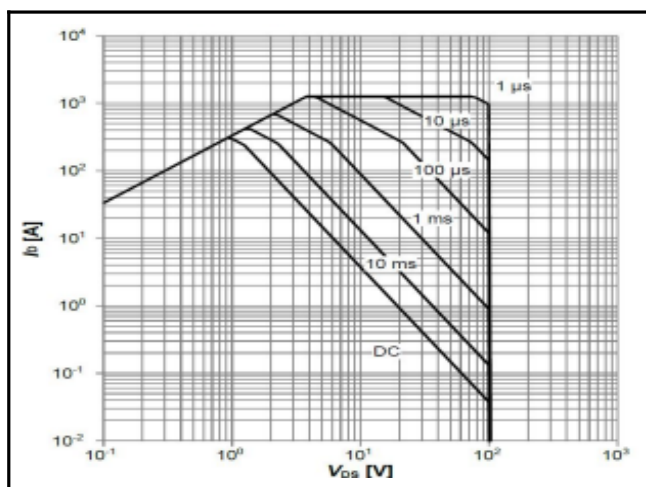
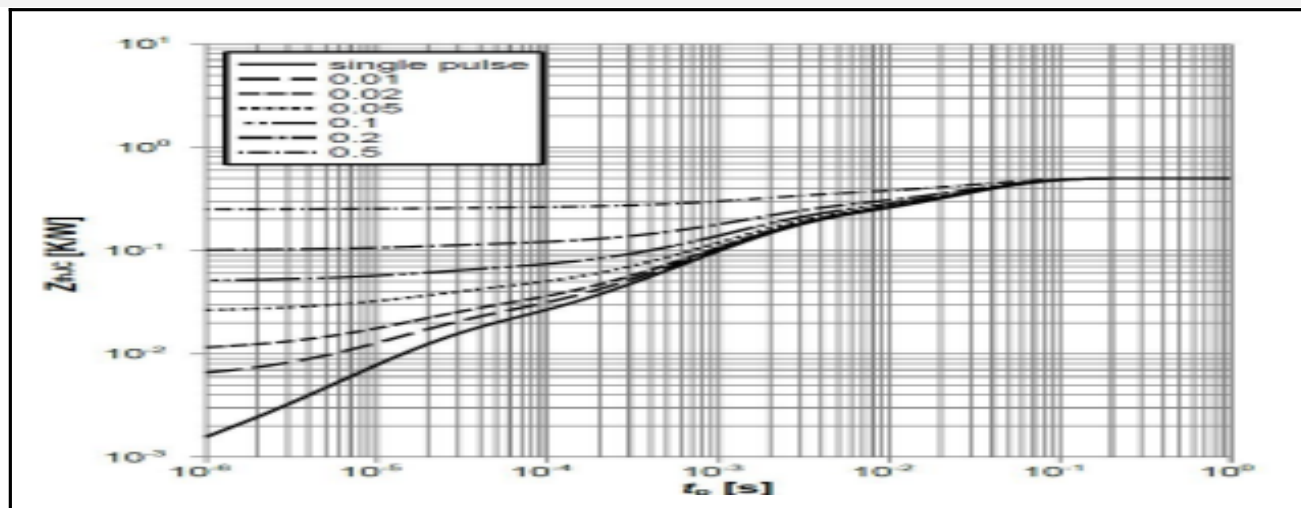


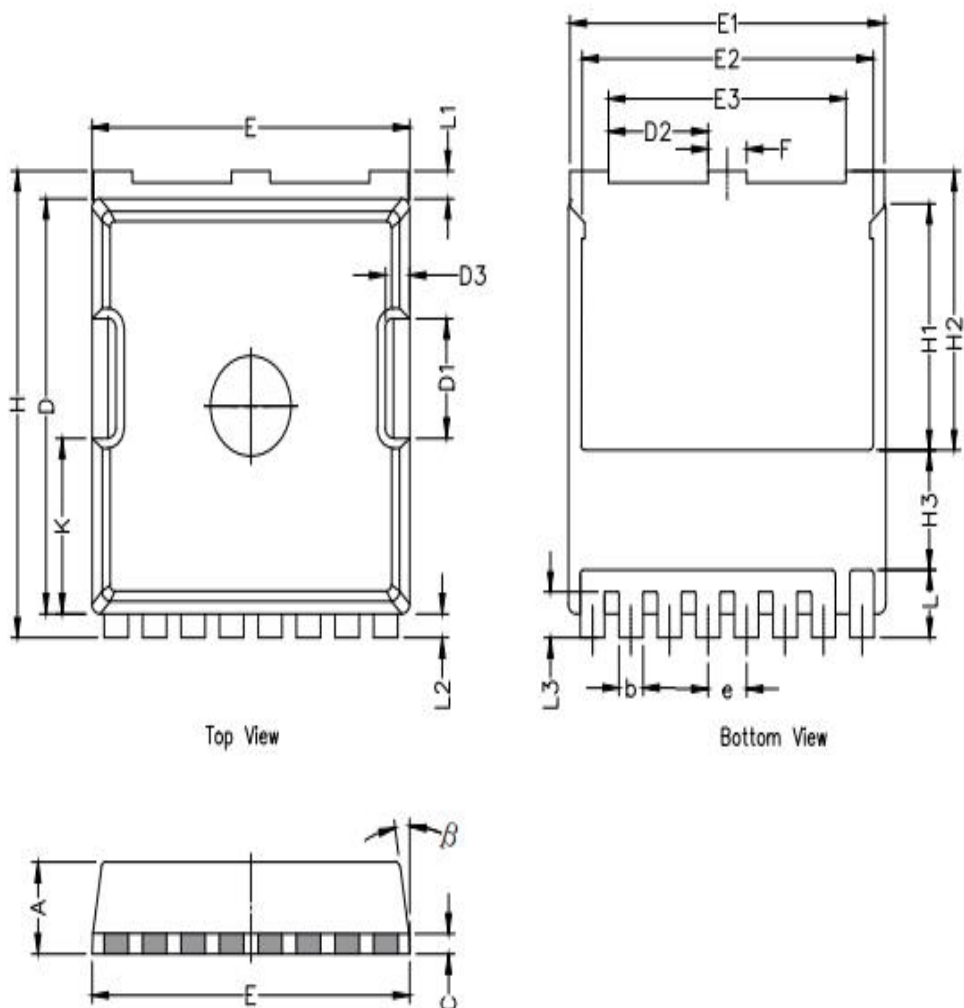
Figure 11: Normalized Transient Thermal Impedance vs Pulse Width



BMTO10N140

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Packaging Tape -TOLL



SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
A	2.20	2.30	2.40
b	0.65	0.77	0.90
C	0.508 REF		
D	10.25	10.40	10.55
D1	2.85	3.10	3.40
D2	2.95	3.10	3.25
D3	0.75 REF		
E	9.75	9.90	10.05
E1	9.65	9.80	9.95
E2	8.00	8.60	9.25
E3	7.10	7.40	7.70
e	1.20 BSC		
F	1.05	1.20	1.35
H	11.55	11.70	11.85
H1	6.03	6.19	6.35
H2	6.85	7.00	7.15
H3	2.90 REF		
L	1.40	1.70	2.10
L1	0.55	0.70	0.85
L2	0.45	0.60	0.75
L3	1.00	1.15	1.30
β	10° REF		
K	4.20	4.37	4.55

