

BCLT65N30P1

N-Channel Silicon Carbide Power MOSFET

650 V, 73 A , 30 mΩ

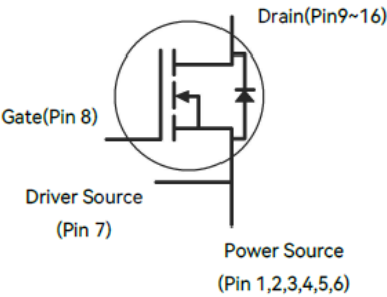
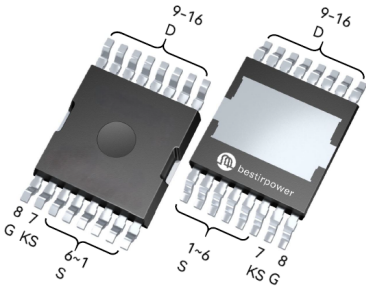
Features

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitance
- Easy to Parallel and Simple to Drive
- Avalanche Ruggedness
- Resistant to Latch-Up
- Halogen Free, RoHS Compliant

$BV_{DSS}, T_c=25^{\circ}C$	$I_D, T_c=25^{\circ}C$	$R_{DS(on),typ}$	$Q_{g,typ}$
650 V	73 A	30 mΩ	130.7 nC

Applications

- LED Lighting Power Supplies
- High Voltage DC/DC Converters
- Industrial Power Supplies
- HVAC



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

Symbol	Parameter		Value	Unit
V _{DSS}	Drain to Source Voltage		650	V
V _{GSmax}	Gate to Source Voltage		-10 / +22	V
V _{GSop}	Recommended Operation Value		-5 / +18	V
I _D	Drain Current	V _{GS} =18V, (T _C = 25°C)	73	A
		V _{GS} =18V, (T _C = 100°C)	52	
I _{DM}	Drain Current	Pulse Width tp Limited by TJmax	146	A
P _D	Power Dissipation	(T _C = 25°C), T _J =175 C	258	W
T _J , T _{STG}	Operating and Storage Temperature Range		-55 to 175	°C

Thermal Characteristics

Symbol	Parameter	Value	Unit
R _{θJC}	Thermal Resistance, Junction to Case, Max.	0.58	°C/W
T _{sold}	Soldering temperature, wave soldering only allowed at leads	260	°C

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
--------	-----------	-----------------	-----	-----	-----	------

Off Characteristics

BV_{DSS}	Drain to Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 100\text{ }\mu\text{A}$	650	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 650\text{ V}, V_{GS} = 0\text{ V}$	-	1	100	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS} = 20\text{ V}$	-	-	200	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 10\text{ mA}$	1.5	2.4	4.2	V
$R_{DS(on)}$	Static Drain to Source On Resistance	$V_{GS} = 18\text{ V}, I_D = 40\text{ A}, T_C = 25^\circ\text{C}$	-	30	45	mΩ
		$V_{GS} = 18\text{ V}, I_D = 40\text{ A}, T_C = 175^\circ\text{C}$	-	48	-	

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 400\text{ V}$ $f = 1.0\text{ MHz}, V_{AC} = 25\text{ mV}$	-	3075	-	pF
C_{oss}	Output Capacitance		-	187	-	
C_{rss}	Reverse Capacitance		-	4.5	-	
E_{oss}	Stored Energy in Output Capacitance		-	18	-	μJ
$Q_{g(tot)}$	Total Gate Charge	$V_{DS} = 400\text{ V}, I_D = 40\text{ A}$ $V_{GS} = -5\text{ V} / 18\text{ V}$	-	130.7	-	nC
Q_{gs}	Gate to Source Charge		-	46	-	
Q_{gd}	Gate to Drain "Miller" Charge		-	36	-	
R_G	Internal Gate Resistance	$f = 1.0\text{ MHz}, V_{AC} = 25\text{ mV}$	-	1.4	-	Ω

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 400\text{ V}, I_D = 40\text{ A}$ $V_{GS} = -5\text{ V} / 18\text{ V},$ $R_{G(ext)} = 5\Omega$ $L = 200\text{ }\mu\text{H}$	-	8.3	-	ns
t_r	Turn-On Rise Time		-	11.8	-	
$t_{d(off)}$	Turn-Off Delay Time		-	27.2	-	
t_f	Turn-Off Fall Time		-	10.2	-	
E_{on}	Turn-on Switching Energy		-	76.5	-	μJ
E_{off}	Turn-off Switching Energy		-	105.1	-	

Source-Drain Diode Characteristics

I_S	Maximum Continuous Diode Forward Current		-	63	-	A
V_{SD}	Diode Forward Voltage	$V_{GS} = -5\text{ V}, I_S = 20\text{ A}$	-	3.5	-	V
I_{rm}	Peak Reverse Recovery Current	$V_{DS} = 400\text{ V}, I_S = 40\text{ A},$ $V_{GS} = -5\text{ V}, \text{dif}/\text{dt} = 5210\text{ A}/\mu\text{s}$	-	63.8	-	A
t_{rr}	Reverse Recovery Time		-	14.8	-	ns
Q_{rr}	Reverse Recovery Charge		-	557.7	-	nC

Typical Performance Characteristics

Figure 1: Output Characteristics $T_J = -55^{\circ}\text{C}$

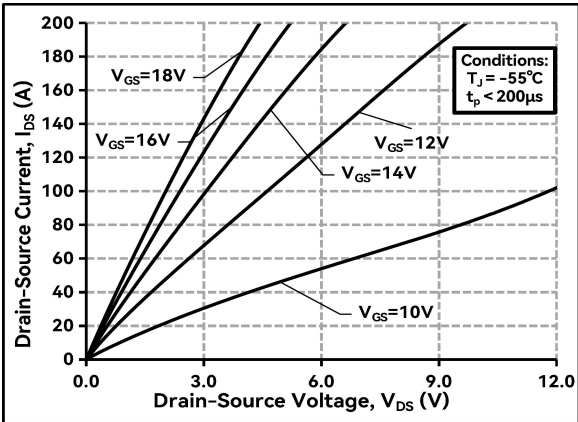


Figure 2: Output Characteristics $T_J = 25^{\circ}\text{C}$

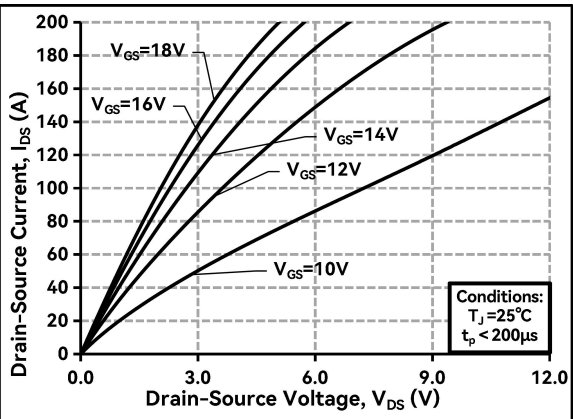


Figure 3: Output Characteristics $T_J = 175^{\circ}\text{C}$

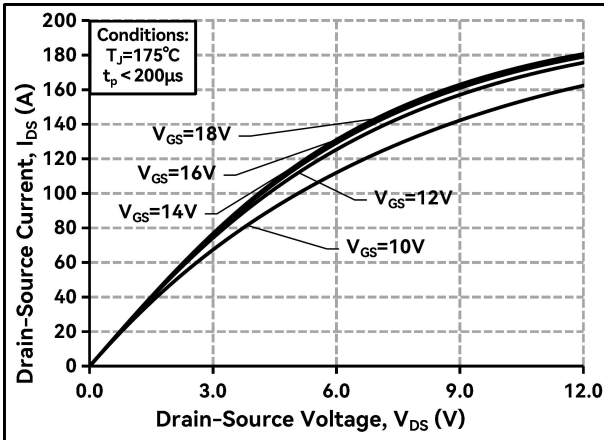


Figure 4: Transfer Characteristic for Various Junction Temperatures

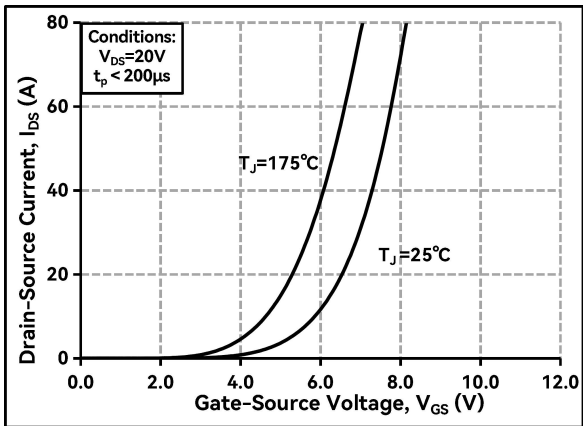


Figure 5: Normalized On-Resistance vs Temperature

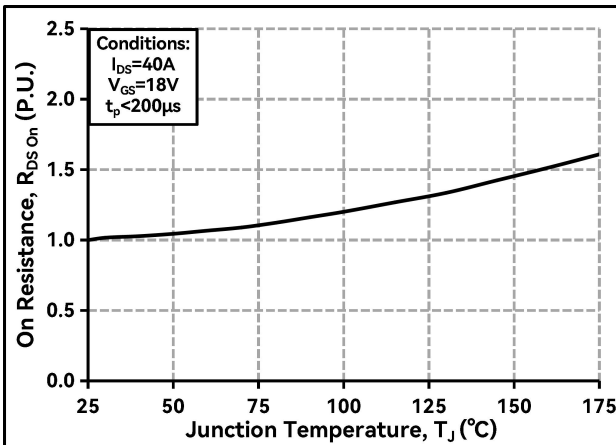
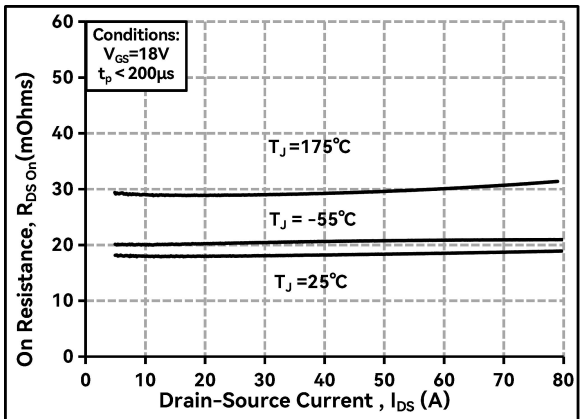


Figure 6: On-Resistance vs Drain Current For Various Temperatures



Typical Performance Characteristics

Figure 7: On-Resistance vs Temperature
For Various Gate Voltage

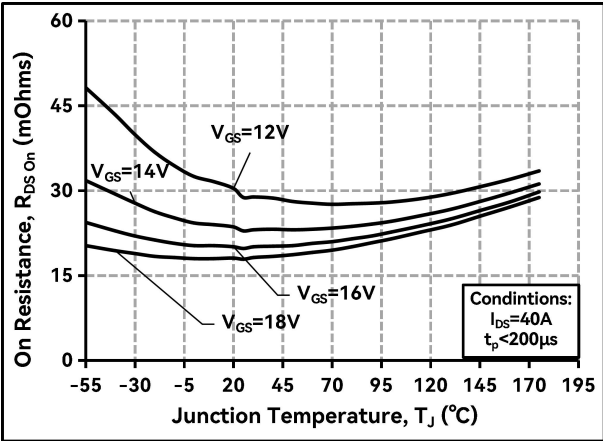


Figure 8: Body Diode Characteristic at -55°C

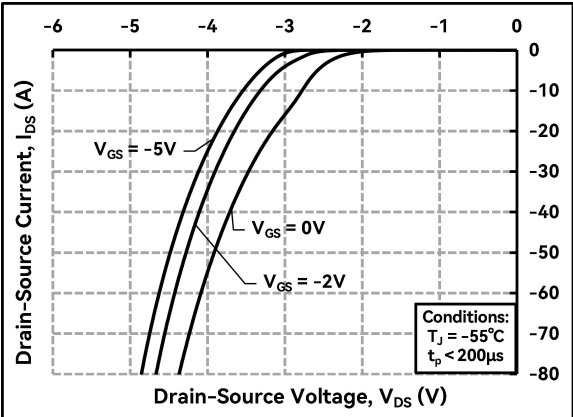


Figure 9: Body Diode Characteristic at 25°C

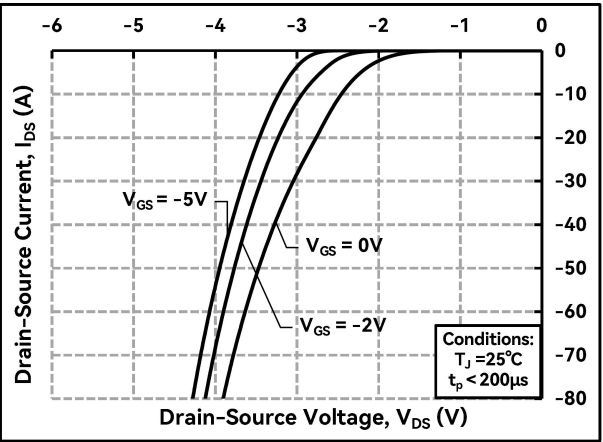


Figure 10: Body Diode Characteristic at 175°C

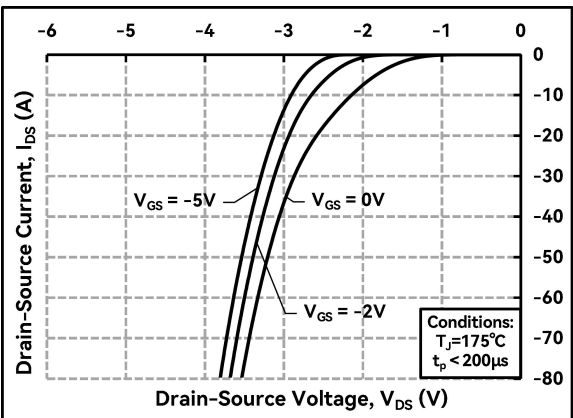


Figure 11: Threshold Voltage vs Temperature

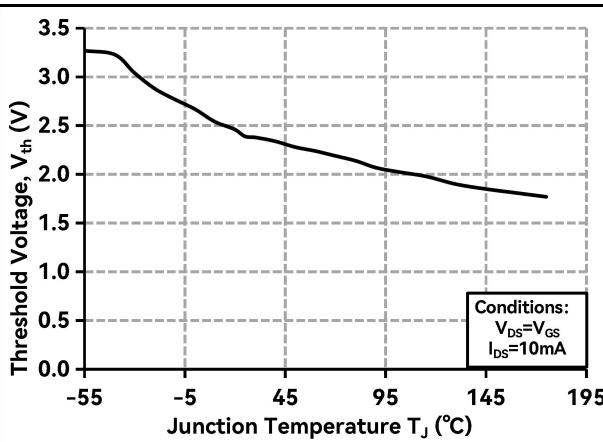
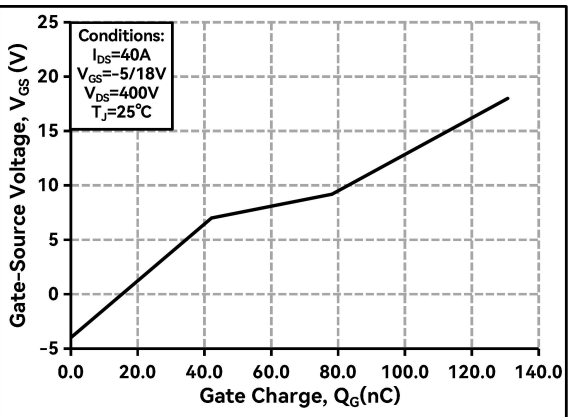


Figure 12: Gate Charge Characteristics



Typical Performance Characteristics

Figure 13: 3rd Quadrant Characteristic at -55℃

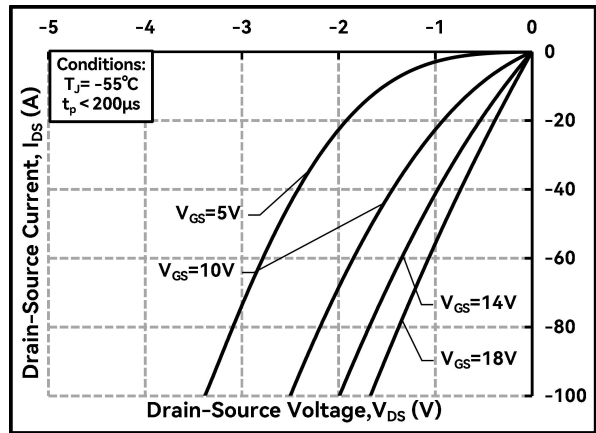


Figure 14: 3rd Quadrant Characteristic at 25℃

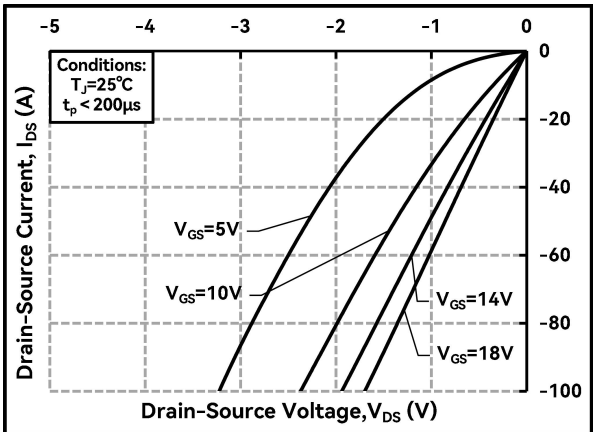


Figure 15: 3rd Quadrant Characteristic at 175℃

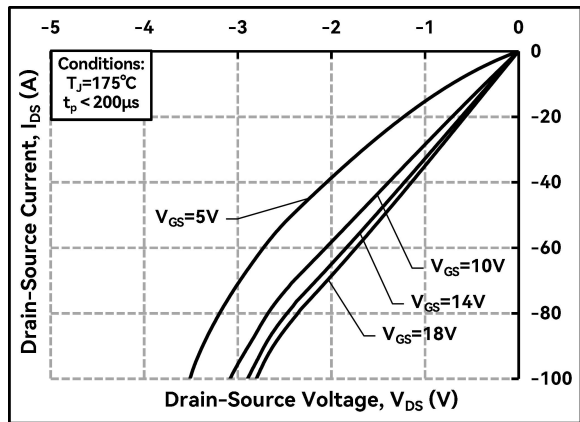


Figure 16: Capacitance vs Drain-Source Voltage (0-200 V)

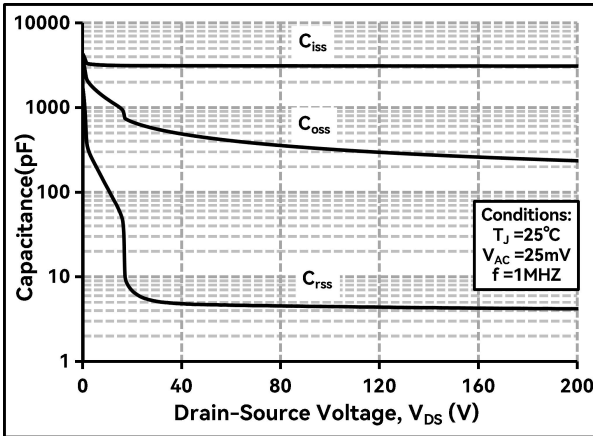


Figure 17: Capacitance vs Drain-Source Voltage (0-600 V)

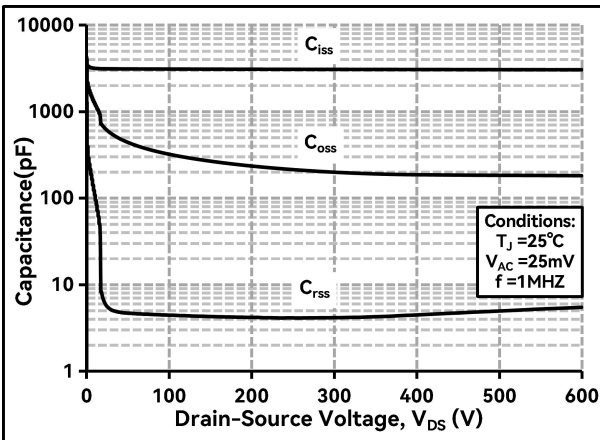
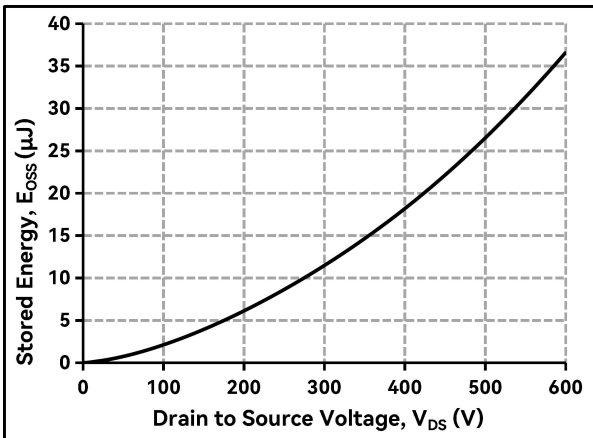


Figure 18: Output Capacitor Stored Energy



Typical Performance Characteristics

Figure19: Maximum Power Dissipation Derating vs Case Temperature

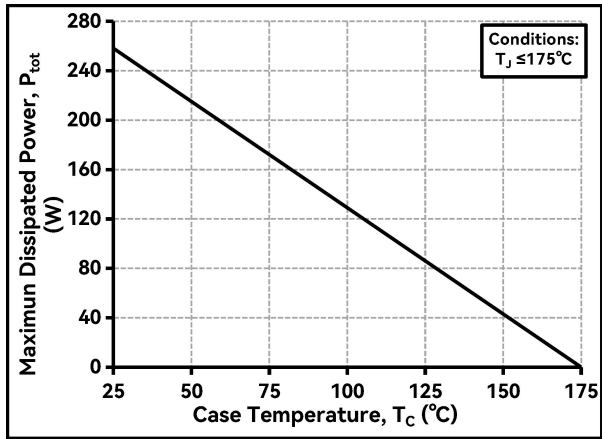


Figure 20: Continuous Drain Current Derating vs Case Temperature

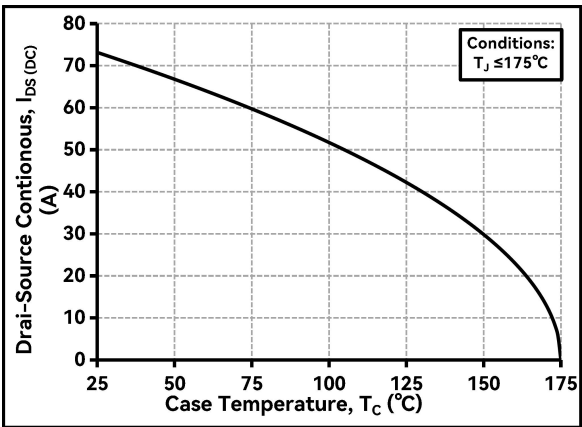


Figure 21: Transient Thermal Impedance (Junction - Case)

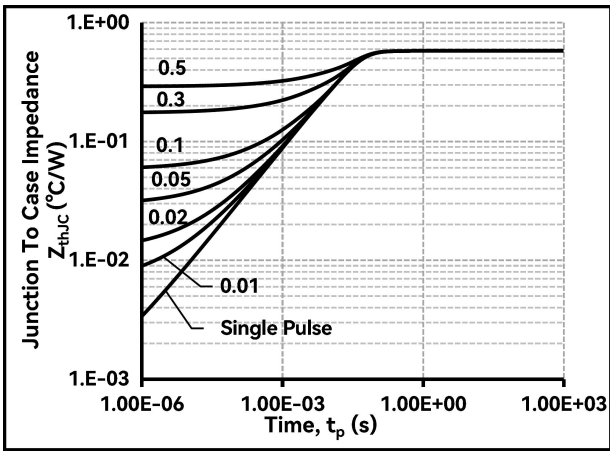


Figure 22: Safe Operating Area

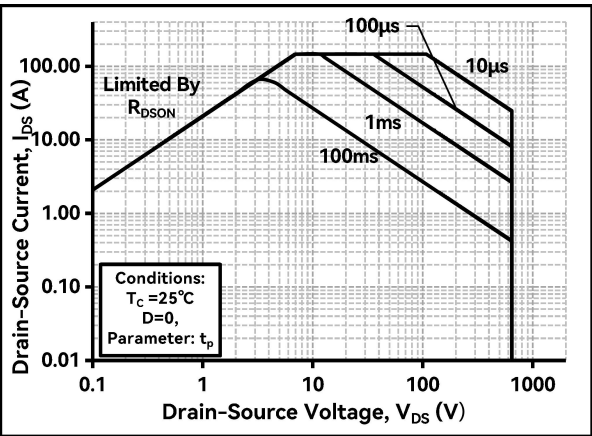


Figure 23: Clamped Inductive Switching Energy vs Drain Current

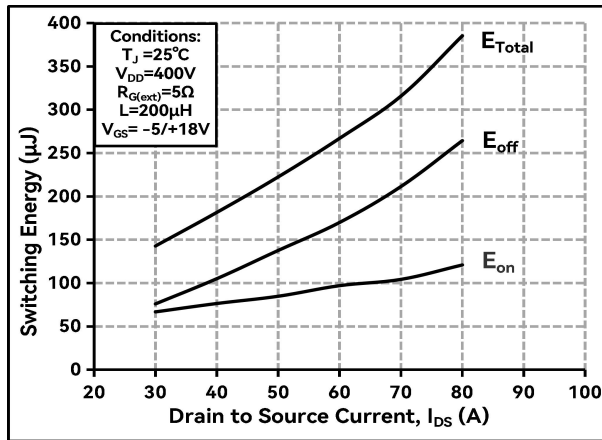
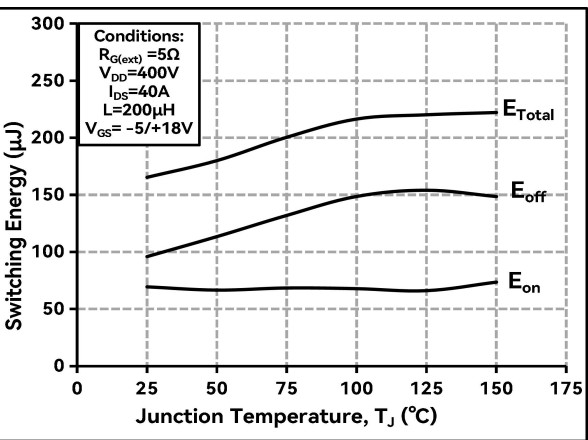
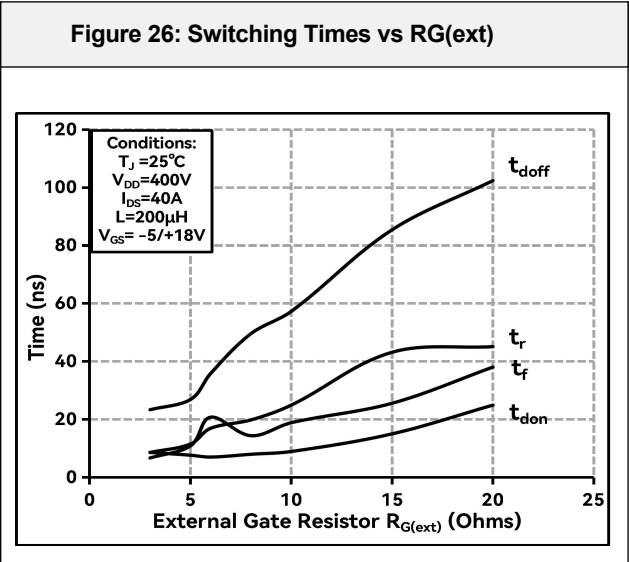
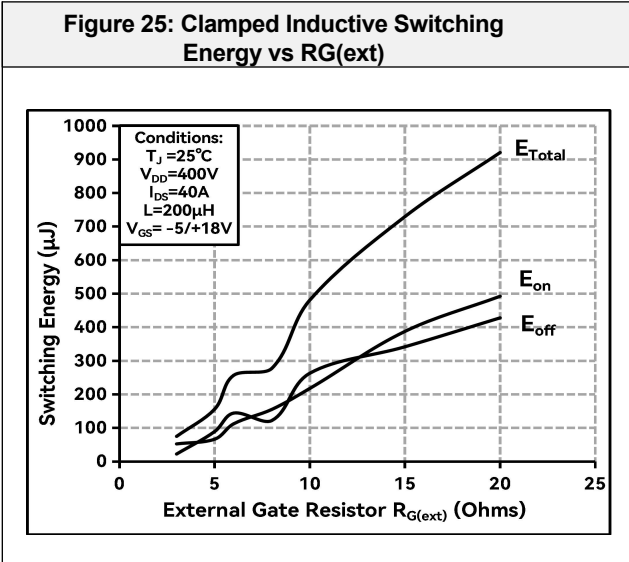


Figure 24: Clamped Inductive Switching Energy vs Temperature

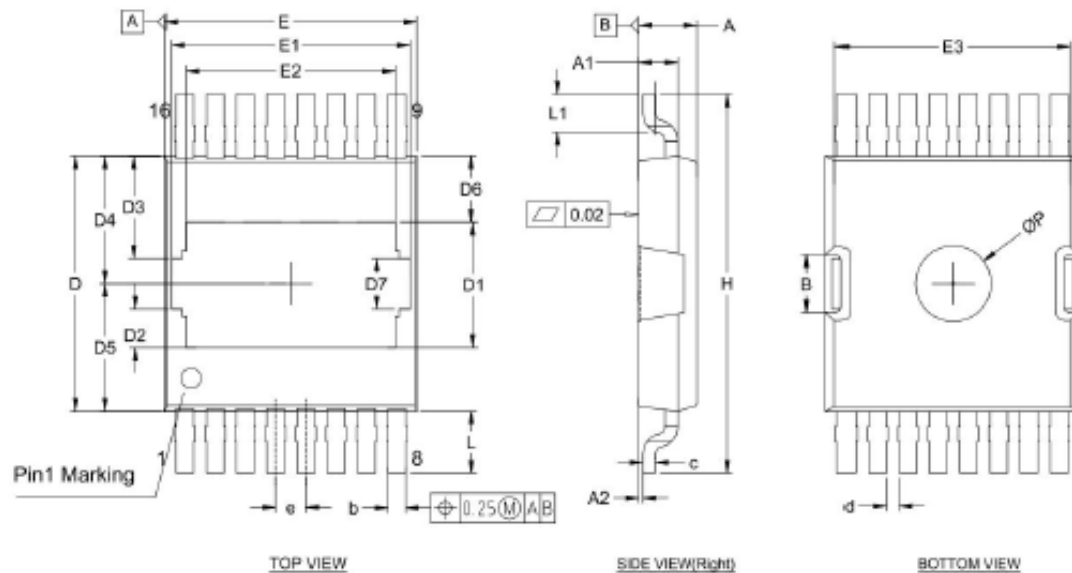


Typical Performance Characteristics



Package Dimensions

TOLT-A-16L



Type	Millimeters		
	Min	Nom	Max
A	2.250	2.300	2.350
A1	1.440	1.540	1.640
A2	0.010	---	0.160
b	0.600	0.700	0.800
c	0.400	0.500	0.600
d	0.400	0.500	0.600
e	1.200BSC		
D	10.00	10.10	10.30
D1	4.760	4.960	5.160
D2	1.330	1.530	1.730
D3	4.050 REF.		
D4	5.050 REF.		
D5	5.050 REF.		
D6	2.620 REF.		
D7	2.000 REF.		
E	9.700	10.000	10.100

* Dimensions in millimeters

Package Marking and Ordering Information

Part Number	Top Marking	Package	Packing Method	Quantity
BCLT65N30P1	BCLT65N30P1	TOLT-A-16L	Tape & Reel	1800 units

Disclaimer

Bestirpower reserve the right to make changes, corrections, enhancements, modifications, and improvements to Bestirpower products and/or to this document at any time without notice.

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. Bestirpower does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Products or technical information described in this document.

This document is the property of Bestirpower Co., LTD., and not allowed to copy or transformed to other format if not under the authority approval.

© 2026 bestirpower – All rights reserved