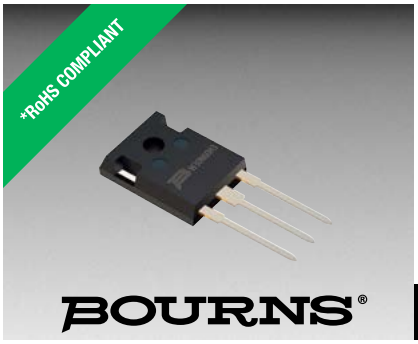


Features

- 600 V, 30 A, Low Collector-Emitter Saturation Voltage ($V_{CE(sat)}$)
- Advanced trench-gate field-stop technology
- Low switching loss
- Fast switching
- RoHS compliant*

Applications

- Switch-Mode Power Supplies (SMPS)
- Uninterruptible Power Sources (UPS)
- Power Factor Correction (PFC)
- Induction heating

BIDNW30N60H3 Insulated Gate Bipolar Transistor (IGBT)

General Information

The Bourns® Model BIDNW30N60H3 IGBT device combines technology from a MOS gate and a bipolar transistor, resulting in an optimum component for high voltage and high current applications. This device uses Trench-Gate Field-Stop technology providing greater control of dynamic characteristics while resulting in a lower Collector-Emitter Saturation Voltage ($V_{CE(sat)}$) and fewer switching losses.

Additional Information

Click these links for more information:

PRODUCT SELECTOR | TECHNICAL LIBRARY | INVENTORY | SAMPLES | CONTACT

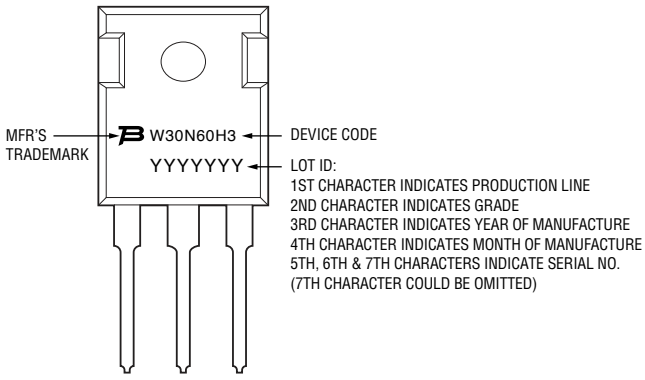
Maximum Electrical Ratings (T_C = 25 °C, unless otherwise specified)

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CES}	600	V
Continuous Collector Current (T_C = 25 °C), limited by T_{jmax}	I_C	60	A
Continuous Collector Current (T_C = 100 °C), limited by T_{jmax}	I_C	30	A
Pulsed Collector Current, t_p limited by T_{jmax}	I_{CP}	120	A
Gate-Emitter Voltage	V_{GE}	±20	V
Continuous Forward Current (T_C = 100 °C), limited by T_{jmax}	I_F	12	A
Total Power Dissipation	P_{total}	230	W
Storage Temperature	T_{STG}	-55 to +150	°C
Operating Junction Temperature	T_j	-55 to +150	°C

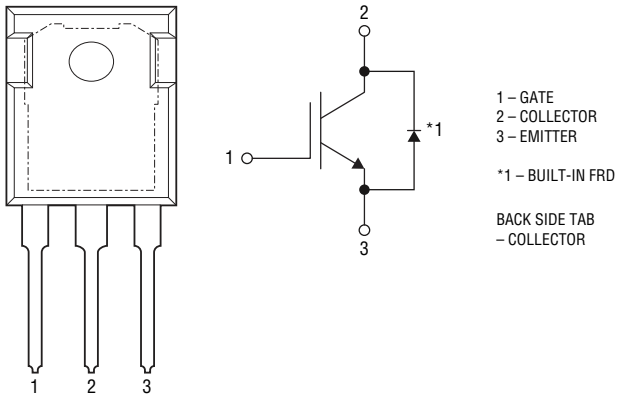
Thermal Resistance

Parameter	Symbol	Max	Unit
IGBT Thermal Resistance Junction - Case	$R_{th(j-c)_IGBT}$	0.54	°C/W
Diode Thermal Resistance Junction - Case	$R_{th(j-c)_Diode}$	1.5	°C/W

Typical Part Marking



Internal Circuit



WARNING Cancer and Reproductive Harm
www.P65Warnings.ca.gov

*RoHS Directive 2015/863, Mar 31, 2015 and Annex.
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Static Electrical Characteristics (T_C = 25 °C, Unless Otherwise Specified)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Collector-Emitter Breakdown Voltage	BV_{CES}	V_{GE} = 0 V, I_C = 250 µA	600	—	—	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	V_{GE} = 15 V, I_C = 30 A T_C= 25 °C	—	1.65	2.0	V
		V_{GE} = 15 V, I_C = 30 A T_C= 125 °C	—	1.9	—	
Diode Forward On-Voltage	V_F	I_F = 12 A, T_C = 25 °C	—	1.8	—	V
		I_F = 12 A, T_C = 125 °C	—	1.4	—	V
Gate Threshold Voltage	$V_{GE(th)}$	V_{CE} = V_{GE}, I_C = 250 µA	4.0	5.0	6.5	V
Collector Cut-off Current	I_{CES}	V_{GE} = 0 V, V_{CE} = 600 V	—	—	200	µA
Gate-Emitter Leakage Current	I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V	—	—	±400	nA

Dynamic Electrical Characteristics (T_C = 25 °C, Unless Otherwise Specified)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Input Capacitance	C_{ies}	V_{CE} = 30 V, V_{GE} = 0 V, f = 1 MHz	—	1780	—	pF
Output Capacitance	C_{oes}		—	100	—	
Reverse Transfer Capacitance	C_{res}		—	32	—	
Total Gate Charge	Q_g	V_{CE} = 400 V, V_{GE} = 15 V I_C = 30.0 A	—	76	—	nC
Gate-Emitter Charge	Q_{ge}		—	20	—	
Gate-Collector Charge	Q_{gc}		—	38	—	

IGBT Switching Characteristics (Inductive Load, T_C = 25 °C, unless otherwise specified)

Parameter (T_C = 25 °C)	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Turn-on Delay Time	$t_{d(on)}$	V_{CE} = 400 V, V_{GE} = 15 V I_C = 30.0 A, R_G = 10 Ω	—	30	—	ns
Current Rise Time	t_r		—	105	—	ns
Turn-off Delay Time	$t_{d(off)}$		—	67	—	ns
Current Fall Time	t_f		—	100	—	ns
Turn-on Switching Energy	E_{on}		—	1.85	—	mJ
Turn-off Switching Energy	E_{off}		—	0.45	—	mJ
Total Switching Energy	E_{ts}		—	2.3	—	mJ

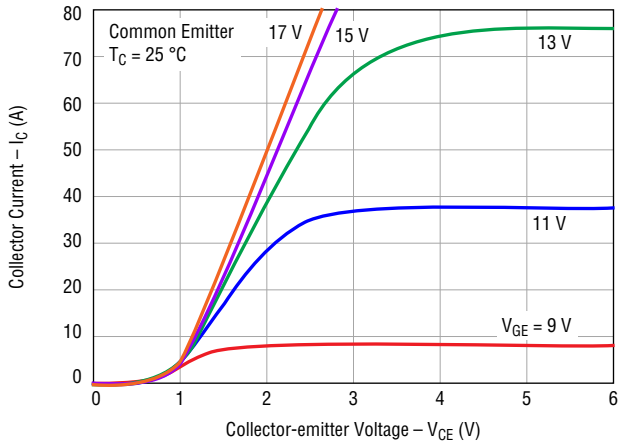
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Diode Switching Characteristics (T_C = 25 °C, unless otherwise specified)

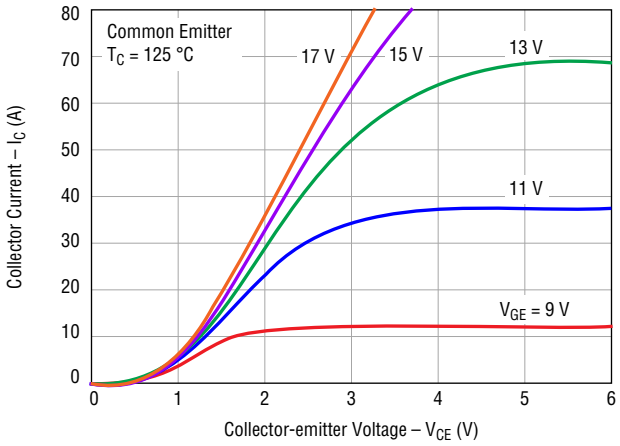
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Reverse Recovery Time	t_{rr}	dI_F/dt = 200 A/μs I_F = 12.0 A	—	28	—	ns
Reverse Recovery Charge	Q_{rr}		—	55	—	nC

Electrical Characteristic Performance

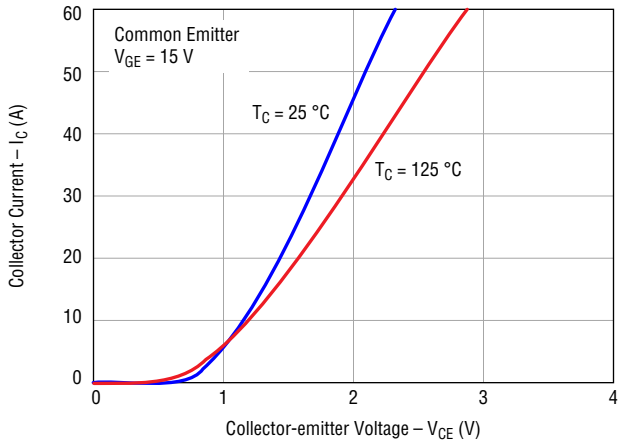
Typical Output Characteristics



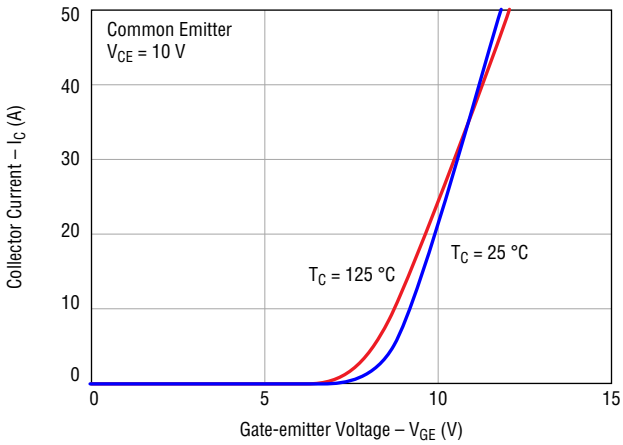
Typical Output Characteristics



Typical Saturation Voltage Characteristics



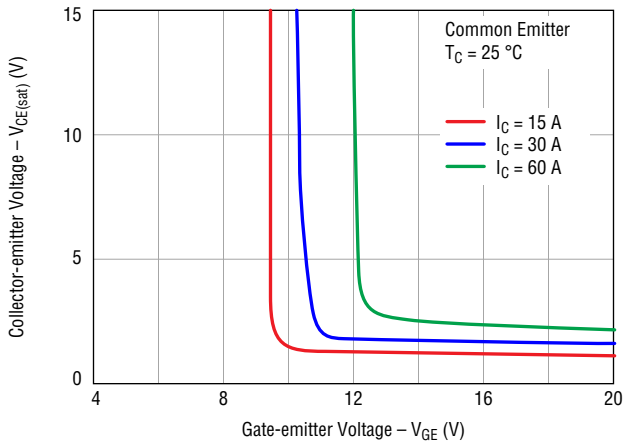
Typical Transfer Characteristics



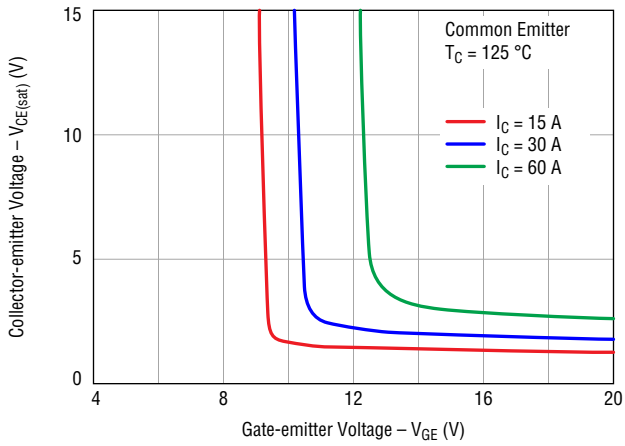
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Electrical Characteristic Performance (continued)

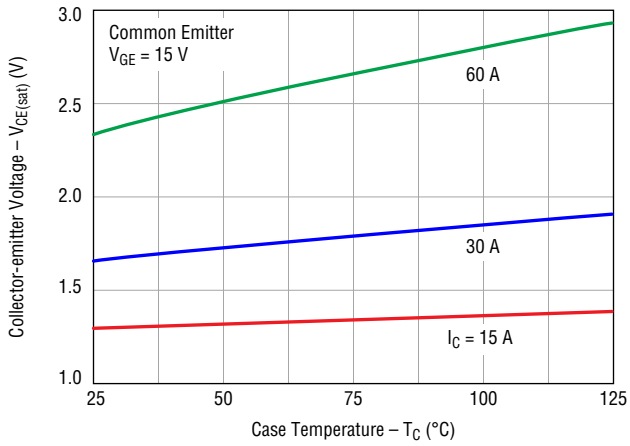
Typical $V_{CE(sat)}$ vs V_{GE} @ T_C = 25 °C



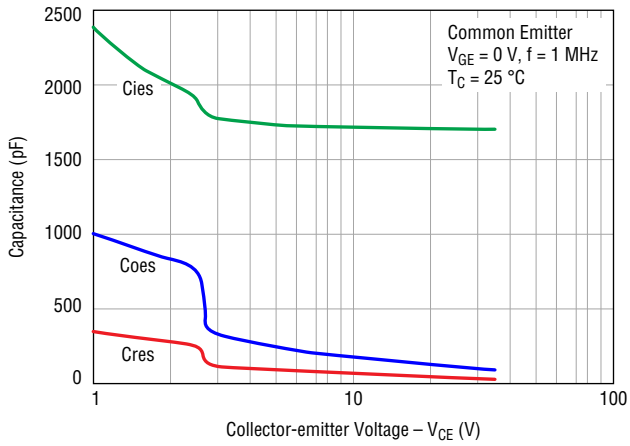
Typical $V_{CE(sat)}$ vs V_{GE} @ T_C = 125 °C



Typical $V_{CE(sat)}$ vs Case Temperature



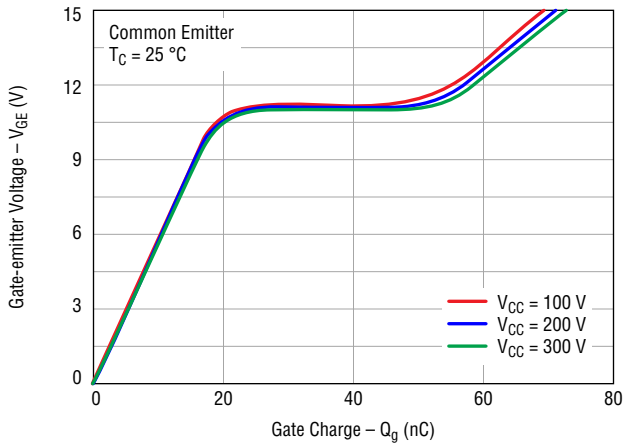
Typical Capacitance Characteristics



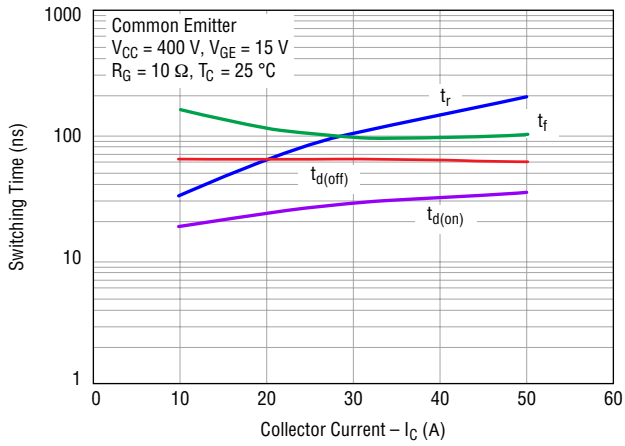
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Electrical Characteristic Performance (continued)

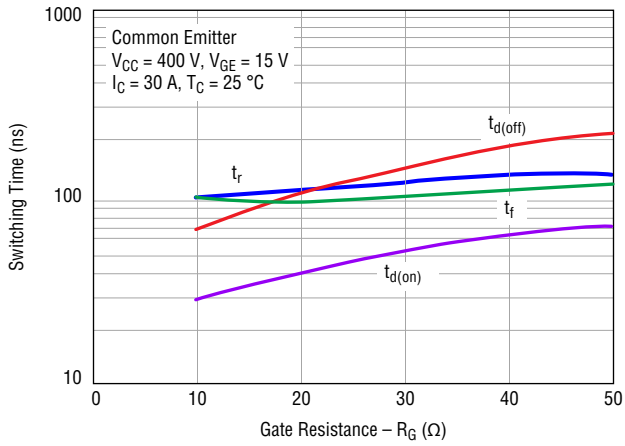
Typical Gate Charge Characteristic



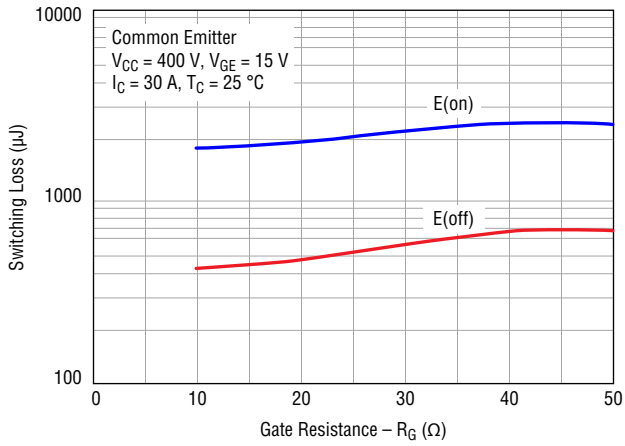
Typical Switching Time Characteristics vs I_C



Typical Switching Time Characteristics vs R_G



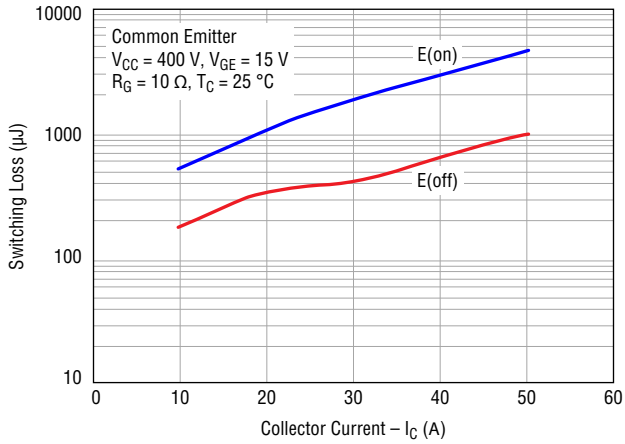
Typical Switching Loss vs R_G



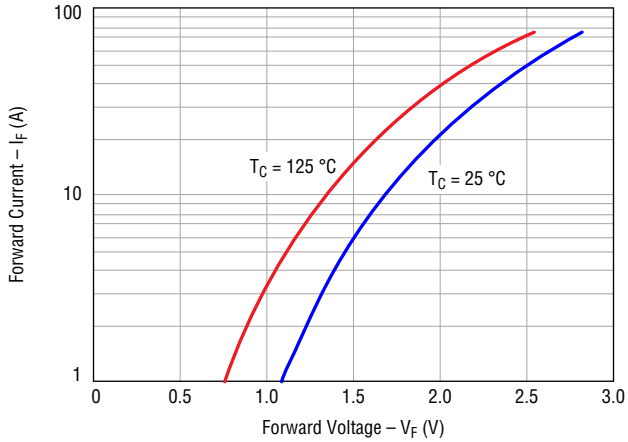
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Electrical Characteristic Performance (continued)

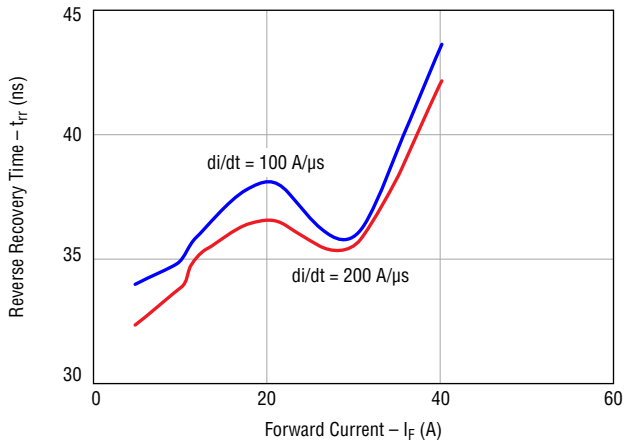
Typical Switching Loss Characteristics vs I_C



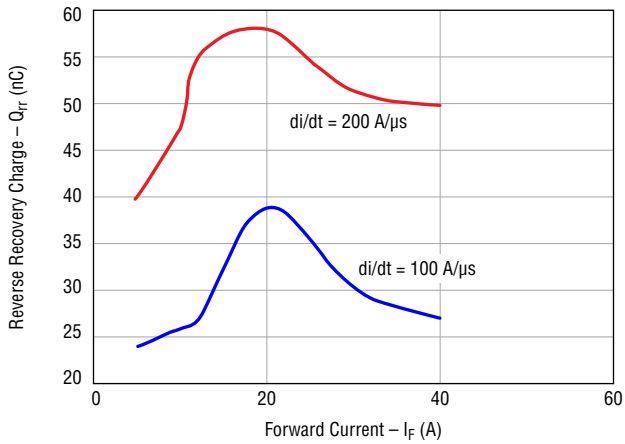
Typical Diode I_F vs V_F



Typical Reverse Recovery Time vs I_F



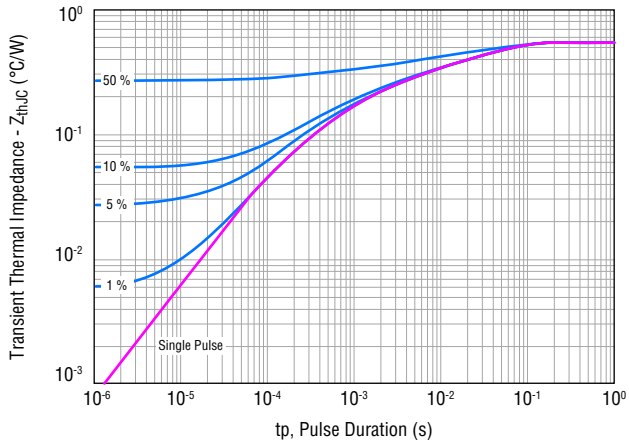
Typical Reverse Recovery Charge vs I_F



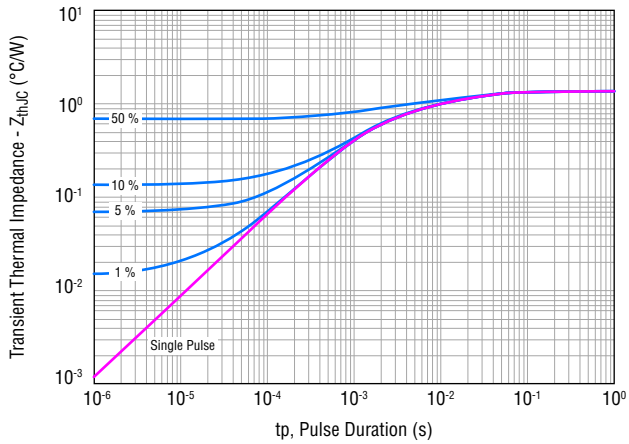
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Electrical Characteristic Performance (continued)

IGBT Transient Thermal Impedance vs $t_{p(on)}$ Duration ($D=t_p/T$)



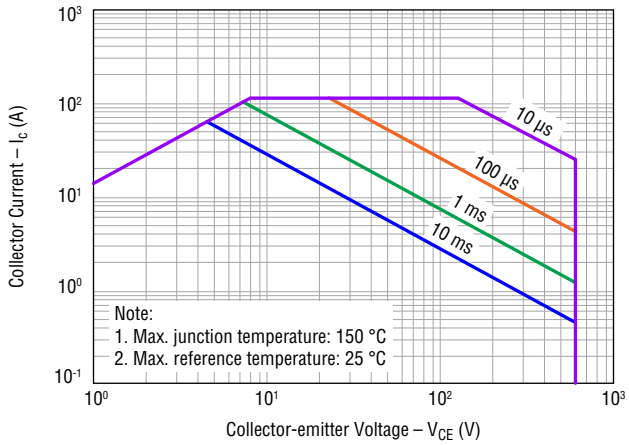
Diode Transient Thermal Impedance vs $t_{p(on)}$ Duration ($D=t_p/T$)



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Electrical Characteristic Performance (continued)

Forward Bias Safe Operating Area

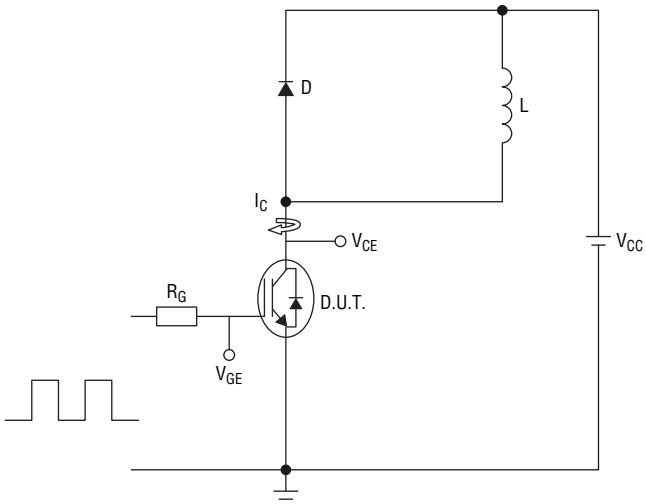


How to Order

B I D NW 30 N 60 H 3

- B = Bourns®
- I = IGBT
- Type
  - D = Discrete
- Packaging Code
  - NW = TO-247N-3L
- Current Rating
  - 30 = 30 A
- Device Type
  - N = N-channel
- Nominal Voltage (divided by 10)
  - 60 = 600 V
- Optimization
  - H = High Speed
- Version Number

Inductive Load Test Circuit



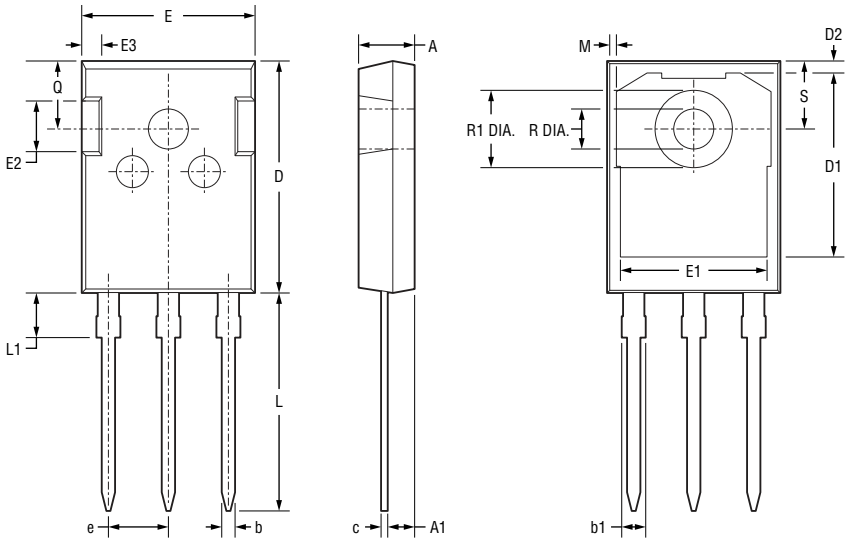
L = 1.87 mH, V_{CE} = 400 V, V_{GE} = 15 V, I_C = 30 A, R_G = 10 Ω

Environmental Characteristics

ESD Class (HBM).....2

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Product Dimensions



DIMENSIONS: MM / (INCHES)

Symbol	Min.	Nom.	Max.
A	4.90 (.193)	5.00 (.197)	5.10 (.201)
A1	2.31 (.091)	2.41 (.095)	2.51 (.099)
b	1.16 (.046)	—	1.26 (.050)
b1	—	—	2.25 (.089)
c	0.59 (.023)	—	0.66 (.026)
D	20.90 (.823)	21.00 (.827)	21.10 (.831)
D1	16.25 (.640)	16.55 (.652)	16.85 (.663)
D2	1.05 (.041)	1.17 (.046)	1.35 (.053)
E	15.70 (.618)	15.80 (.622)	15.90 (.626)
E1	13.10 (.516)	13.30 (.524)	13.50 (.531)
E2	4.40 (.173)	4.50 (.177)	4.60 (.181)
E3	1.50 (.059)	1.60 (.063)	1.70 (.067)
e		5.436 (.214) BSC	
L	19.80 (.780)	19.92 (.784)	20.10 (.791)
L1	—	—	4.30 (.169)
M	0.35 (.014)	—	0.95 (.037)
R	3.40 (.134)	3.50 (.138)	3.60 (.142)
R1	7.00 (.276)	—	7.40 (.291)
Q	5.60 (.220)	—	6.00 (.236)
S	6.05 (.238)	6.15 (.242)	6.25 (.246)

Packaging Specifications

BIDNW30N60H3 ..... 30 pieces per tube

BOURNS®

Asia-Pacific: Tel: +886-2 2562-4117 • Email: asiacus@bourns.com
EMEA: Tel: +36 88 885 877 • Email: eurocus@bourns.com
The Americas: Tel: +1-951 781-5500 • Email: americus@bourns.com
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The characteristics and parameters of a Bourns® product set forth in its data sheet are based on laboratory conditions, and statements regarding the suitability of products for certain "typical" applications are based on Bourns' knowledge of typical requirements in generic applications. Bourns assumes that "typical" applications include failsafe/backup features to address critical risks to users and are designed to allow rework of Bourns® product to avoid scrap of a device solely due to malfunctioning Bourns® product. The characteristics and parameters of a Bourns® product in a user application may vary from the data sheet characteristics and parameters due to (i) the combination of the Bourns® product with other components in the user's application, or (ii) the environment of the user application itself. The characteristics and parameters of a Bourns® product also can and do vary in different applications and actual performance may vary over time. Thus, users should always verify the actual performance of the Bourns® product in their specific devices and applications and make their own independent judgments regarding the suitability of Bourns® product and the amount of additional test margin to design into their device or application to compensate for differences between laboratory and real-world conditions.

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Bourns® products are not recommended, authorized or intended for use in applications where failure or malfunction may result in personal injury, death, or severe property or environmental damage, such as without limitation nuclear, life-critical medical and certain automotive and aviation applications. Except as set forth in the bullet points below or unless expressly and specifically approved in writing on a case-by-case basis by an authorized Bourns' representative, use of any Bourns® products in such unauthorized high-risk applications is at the user's sole risk.

- Bourns considers implantable/invasive devices and devices/procedures designed as life-supporting or life-sustaining by the U.S. Food and Drug Administration or equivalent organizations outside of the United States as "life-critical" medical applications. Bourns expressly identifies those Bourns® standard products that are suitable for use in typical medical applications that are not life-critical in its publication entitled "Bourns Medical Grade Component Guide."

- Bourns expressly identifies those Bourns® standard products that are suitable for use in typical automotive applications associated with any Automate Safety Integrity Level (ASIL) in its publication entitled "Bourns Automotive Grade Component Guide." Bourns' designation of Bourns® product as compliant with the AEC-Q standard does not by itself mean that Bourns has approved such product for use in an automotive application.

- Bourns expressly identifies Bourns® standard products that are suitable for use in the typical aviation applications/systems requiring System Design Assurance Level (RTCA DO-254 DAL) of C, D or E in its publication entitled "Bourns Civilian Aerospace/Aviation Grade Component Guide." Bourns does not test its products for compliance with United States Federal Aviation Administration standards or any other generally equivalent governmental organization standard applicable to products designed or manufactured for use in aviation applications. Use of Bourns® standard components in aviation applications associated with RTCA DO-254 DAL A or B without proper approval noted above shall be at the user's sole risk.

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PDF: https://www.bourns.com/docs/Legal/disclaimer.pdf

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Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

www.entegreci.com

Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

www.entegreci.com | **destek@entegreci.com** | **0850 305 90 34**

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