

BOURNS®

BIDD05N60T Insulated Gate Bipolar Transistor (IGBT)

Features

- 600V, 5A, Low $V_{CE(sat)}$
- Novel field stop technology
- Optimized for conduction
- Robust
- RoHS compliant*

Applications

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

General Information

The Bourns® Model BIDD05N60T 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. In addition, this structure increases the robustness of the device.

Additional Information

Click these links for more information:

PRODUCT SELECTOR | TECHNICAL LIBRARY | INVENTORY | SAMPLES | CONTACT

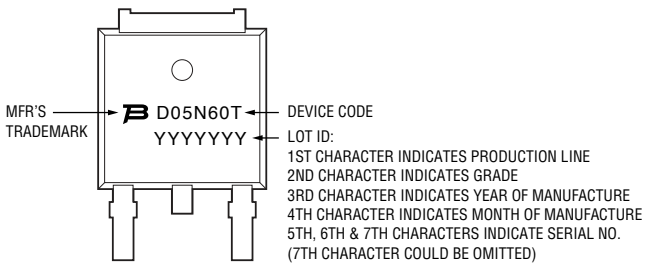
Maximum Electrical Ratings (T_C = 25 °C, unless otherwise specified)

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CES}	600	V
Continuous Collector Current (T_C = 25 °C), limited by T_{jmax}	I_C	10	A
Continuous Collector Current (T_C = 100 °C), limited by T_{jmax}	I_C	5	A
Pulsed Collector Current, t_p limited by T_{jmax}	I_{CP}	15	A
Gate-Emitter Voltage	V_{GE}	±30	V
Continuous Forward Current (T_C = 25 °C), limited by T_{jmax}	I_F	10	A
Short-circuit Withstand Time (V_{CE} = 300 V, V_{GE} = 15 V)	T_{SC}	10	μs
Total Power Dissipation	P_{total}	82	W
Storage Temperature	T_{STG}	-55 to +150	°C
Operating Junction Temperature	T_j	-55 to +150	°C

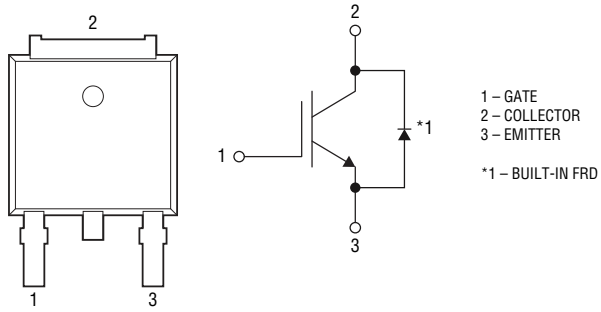
Thermal Resistance

Parameter	Symbol	Max	Unit
IGBT Thermal Resistance Junction - Case	$R_{th(j-c)_IGBT}$	1.51	°C/W
Diode Thermal Resistance Junction - Case	$R_{th(j-c)_Diode}$	2.14	°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 = 5 A T_C= 25 °C	—	1.5	2.0	V
		V_{GE} = 15 V, I_C = 5 A T_C= 125 °C	—	1.7	—	
Diode Forward On-Voltage	V_F	I_F = 5 A, T_C = 25 °C	—	1.3	1.8	V
		I_F = 5 A, T_C = 125 °C	—	1.1	—	V
Gate Threshold Voltage	$V_{GE(th)}$	V_{CE} = V_{GE}, I_C = 250 µA	3.5	5.5	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	—	340	—	pF
Output Capacitance	C_{oes}		—	26	—	
Reverse Transfer Capacitance	C_{res}		—	7.6	—	
Total Gate Charge	Q_g	V_{CE} = 400 V, V_{GE} = 15 V I_C = 5.0 A	—	18.5	—	nC
Gate-Emitter Charge	Q_{ge}		—	5.1	—	
Gate-Collector Charge	Q_{gc}		—	8.6	—	

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 = 5.0 A, R_G = 10 Ω	—	7	—	ns
Current Rise Time	t_r		—	14	—	ns
Turn-off Delay Time	$t_{d(off)}$		—	18	—	ns
Current Fall Time	t_f		—	145	—	ns
Turn-on Switching Energy	E_{on}		—	0.2	—	mJ
Turn-off Switching Energy	E_{off}		—	0.07	—	mJ
Total Switching Energy	E_{ts}		—	0.27	—	mJ

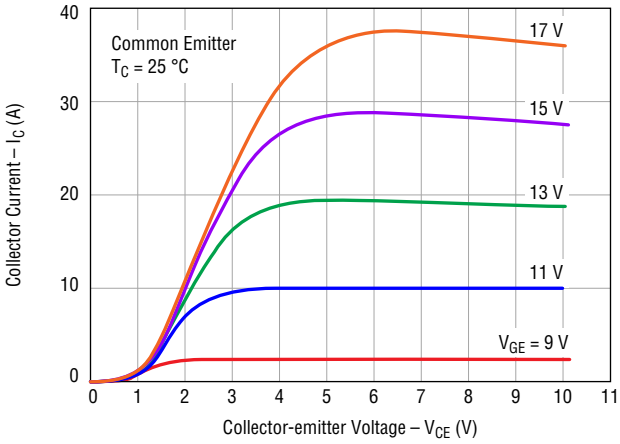
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Diode Switching Characteristics (T_C = 25 °C, unless otherwise specified)

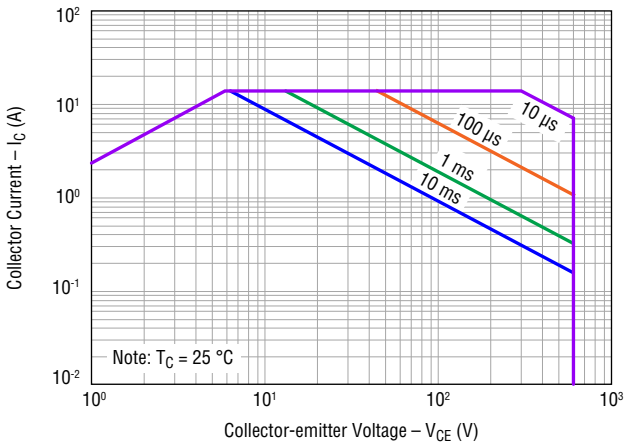
Parameter (T_C = 25 °C)	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Reverse Recovery Time	t_{rr}	dI_F/dt = 200 A/μs I_F = 5.0 A	—	40	—	ns
Reverse Recovery Charge	Q_{rr}		—	80	—	nC

Electrical Characteristic Performance

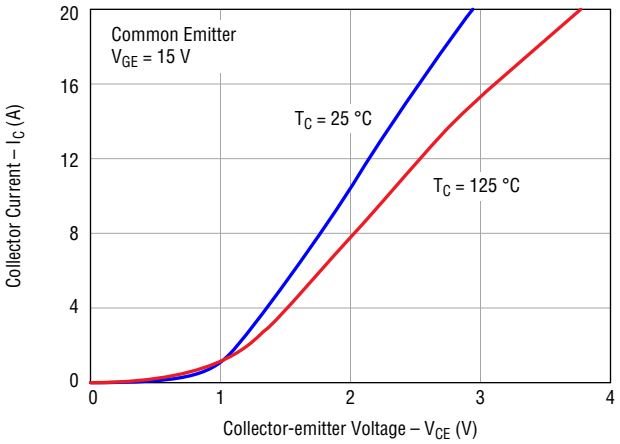
Typical Output Characteristics



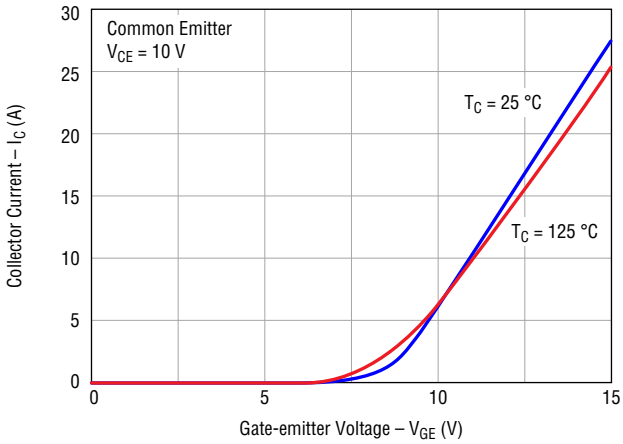
Forward Bias Safe Operating Area



Typical Saturation Voltage Characteristics



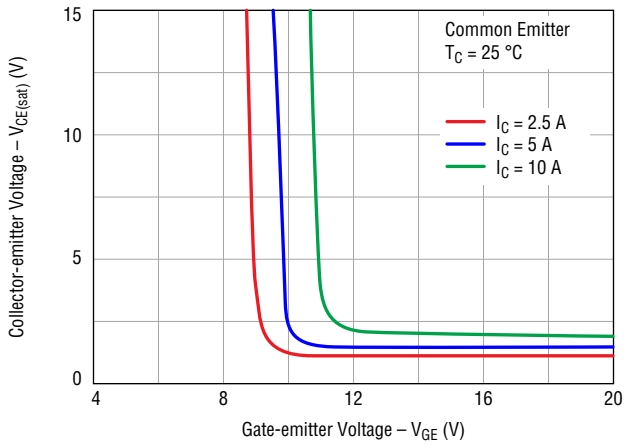
Typical Transfer Characteristics



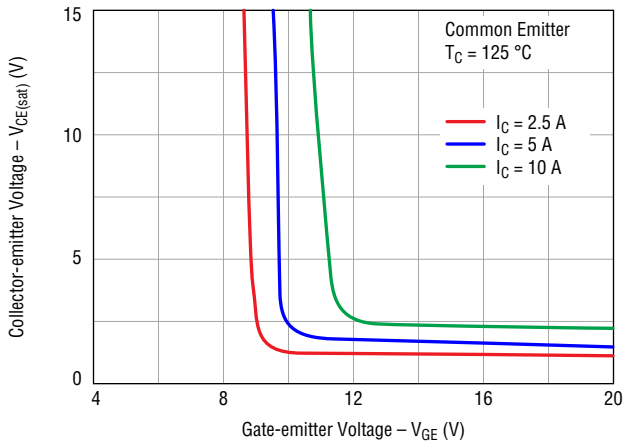
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Electrical Characteristic Performance (continued)

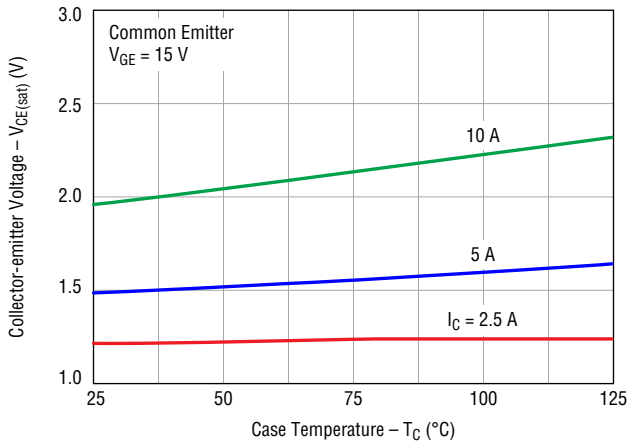
Typical $V_{CE(sat)}$ vs V_{GE} @ T_C = 25 °C



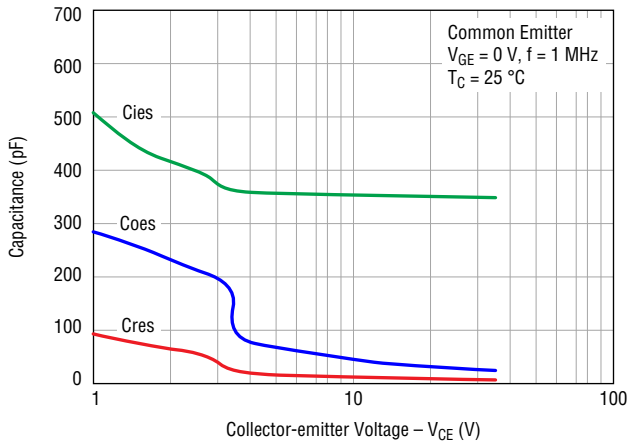
Typical $V_{CE(sat)}$ vs V_{GE} @ T_C = 125 °C



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



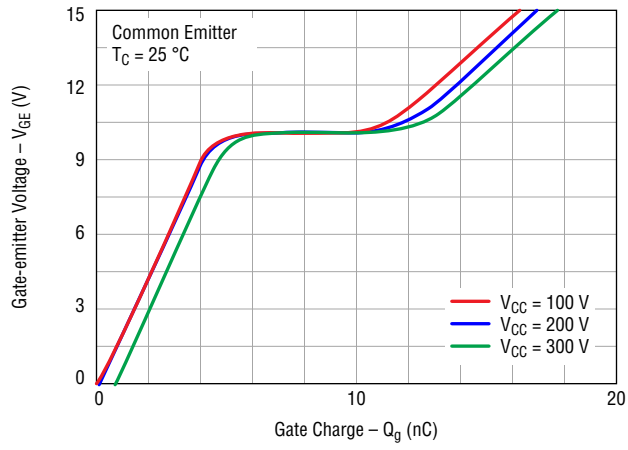
Typical Capacitance Characteristics



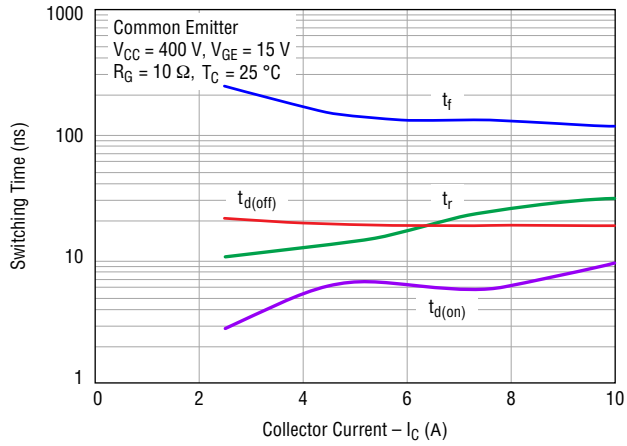
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Electrical Characteristic Performance (continued)

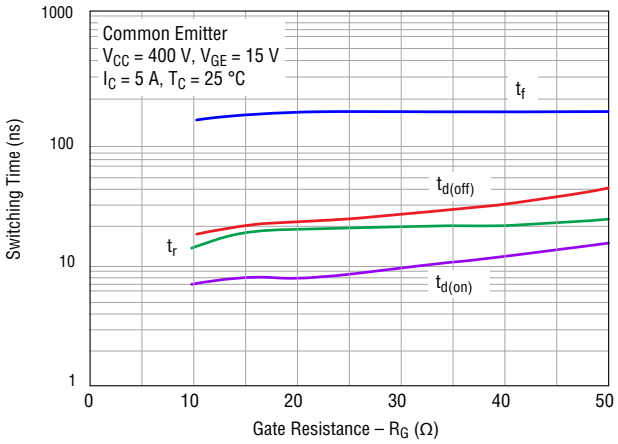
Typical Gate Charge Characteristic



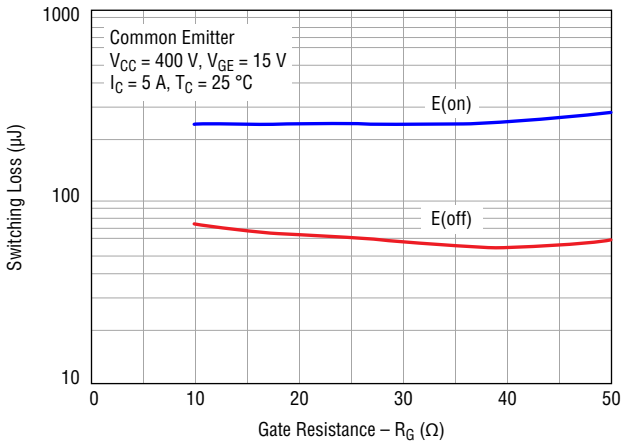
Typical Switching Time Characteristics vs I_C



Typical Switching Time Characteristics vs R_G



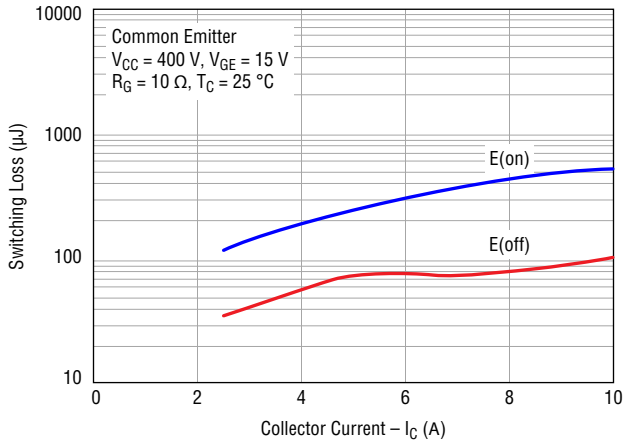
Typical Switching Loss vs R_G



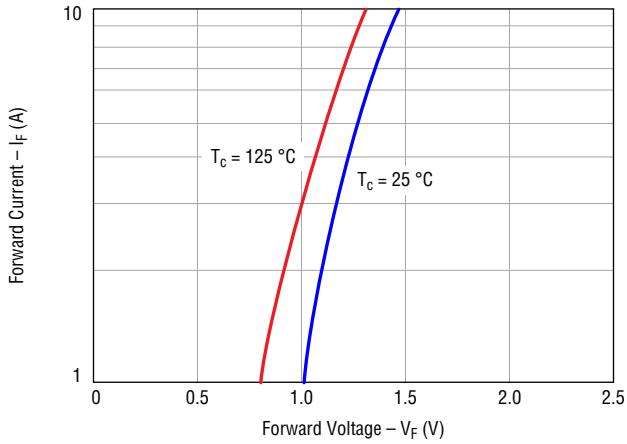
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Electrical Characteristic Performance (continued)

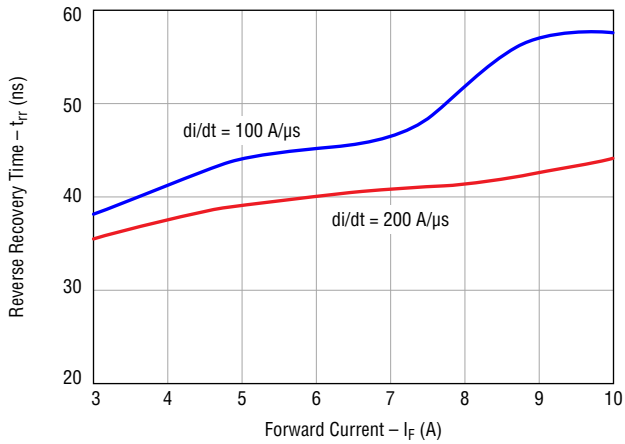
Typical Switching Loss Characteristics vs I_C



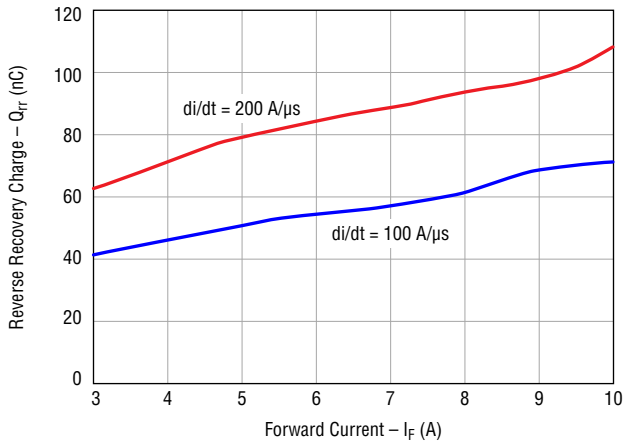
Typical Diode I_F vs V_F



Typical Reverse Recovery Time vs I_F



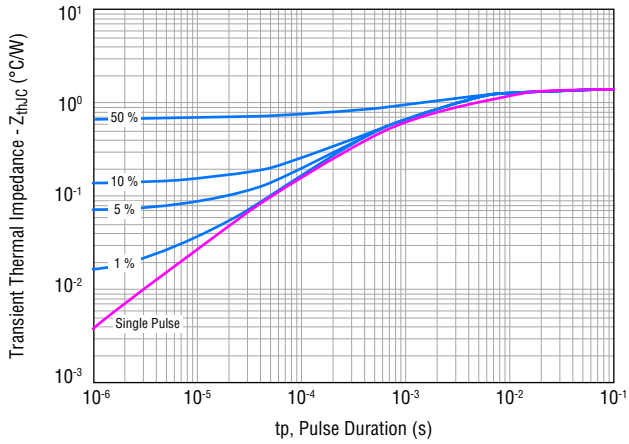
Typical Reverse Recovery Charge vs I_F



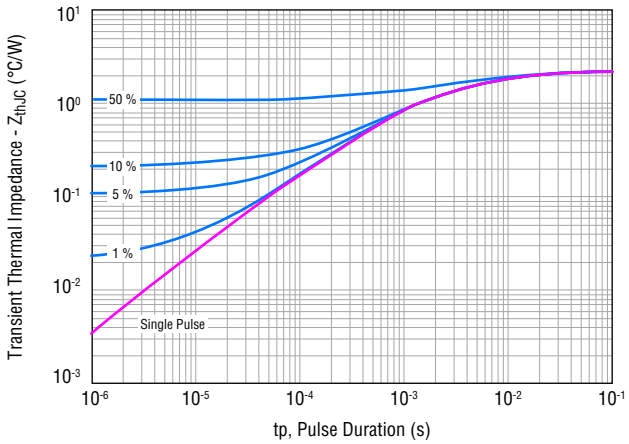
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Electrical Characteristic Performance (continued)

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



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

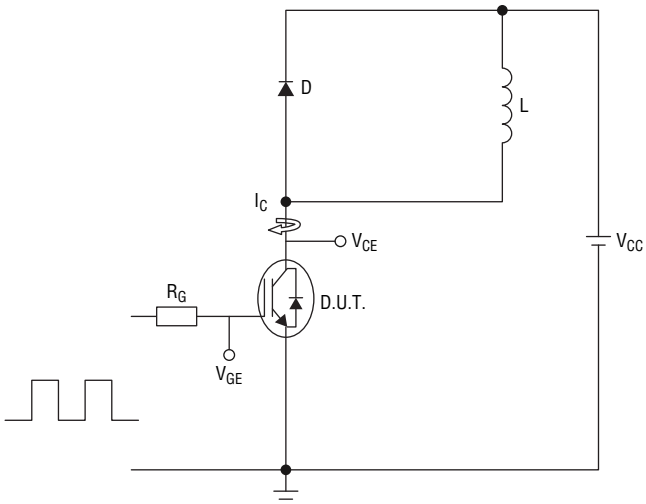


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BIDD05N60T Insulated Gate Bipolar Transistor (IGBT)

BOURNS®

Inductive Load Test Circuit



L = 11.2 mH, V_{CE} = 400 V, V_{GE} = 15 V, I_C = 5 A, R_G = 10 Ω

How to Order

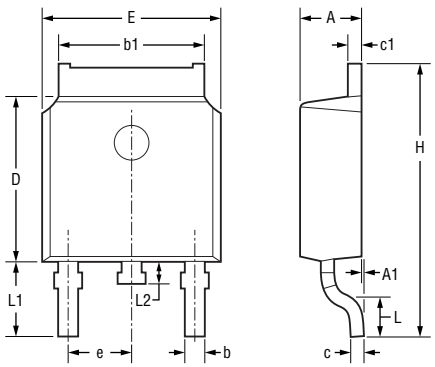
B I D D 05 N 60 T

- B = Bourns®
- I = IGBT
- Type
  - D = Discrete
- Packaging Code
  - D = TO-252 (DPAK)
- Current Rating
  - 05 = 5 A
- Device Type
  - N = N-channel
- Nominal Voltage (divided by 10)
  - 60 = 600 V
- Optimization
  - T = Medium Speed

Environmental Characteristics

Moisture Sensitivity Level.....3
ESD Class (HBM)..... 1B

Product Dimensions

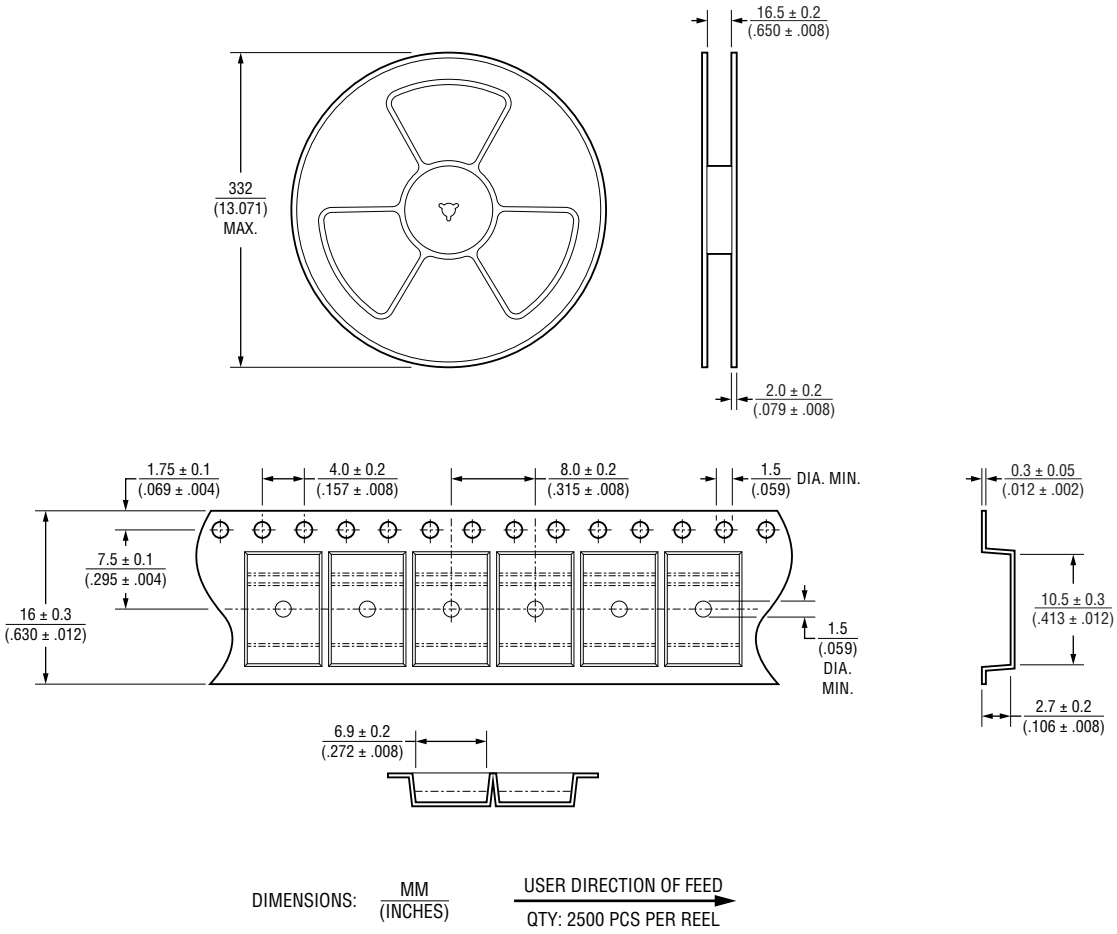


DIMENSIONS: MM / (INCHES)

Symbol	Min.	Nom.	Max.
A	2.10 (.083)	2.30 (.091)	2.50 (.098)
A1	0	—	0.127 (.005)
b	0.66 (.026)	0.76 (.030)	0.89 (.035)
b1	5.10 (.201)	5.33 (.210)	5.46 (.215)
c	0.45 (.018)	—	0.65 (.026)
c1	0.45 (.018)	—	0.65 (.026)
D	5.80 (.228)	6.10 (.240)	6.40 (.252)
E	6.30 (.248)	6.60 (.260)	6.90 (.272)
e		2.30 (.091) TYP	
H	9.60 (.378)	10.10 (.398)	10.60 (.417)
L	1.40 (.055)	1.50 (.059)	1.70 (.067)
L1		2.90 (.114) REF	
L2	0.60 (.024)	0.80 (.031)	1.00 (.039)

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Packaging Specifications



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ENTEGRECİ

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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

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