650V FIELD STOP IGBT IN ITO220AB

Description

The DGTD65T15H2TF is produced using advanced Field Stop Trench IGBT Technology, which provides high-performance, excellent quality, and high ruggedness.

Features

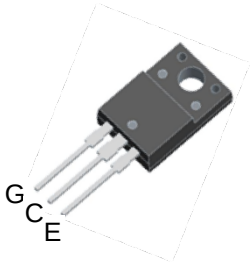
- High Ruggedness for Motor Control
- $V_{CE(sat)}$ Positive Temperature Coefficient
- Very Soft, Fast Recovery Anti-Parallel Diode
- Low EMI
- Maximum Junction Temperature +175°C
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Applications

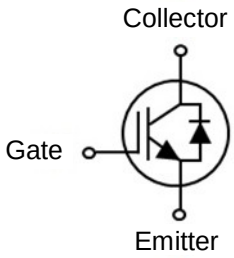
- Motor Drive

Mechanical Data

- Case: ITO220AB (Type MC)
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Terminals: Finish—Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 e3
- Weight: 1.9 grams (Approximate)



ITO220AB (Type MC)



Device Symbol

Ordering Information (Note 4)

Product	Marking	Quantity
DGTD65T15H2TF	DGTD65T15H2	1000 per Box in Tubes (Note 5)

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3).compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.
5. 50 devices per tube.

Marking Information

= Manufacturer's Marking
DGTD65T15H2 = Product Type Marking Code
YY = Year (ex: 18 = 2018)
LLLLL = Lot Code
WW = Week (01 to 53)

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

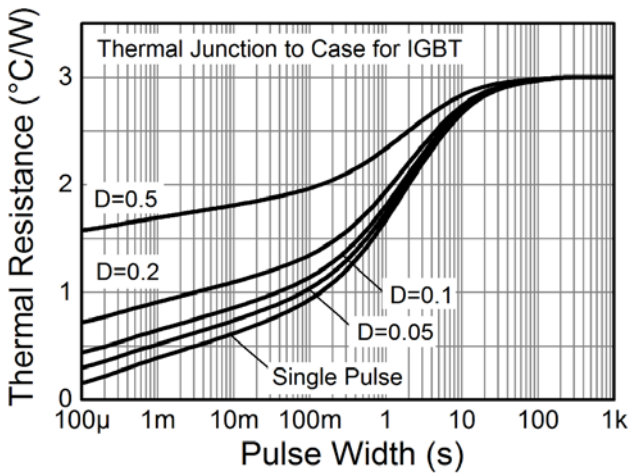
Characteristic		Symbol	Value	Unit
Collector-Emitter Voltage		V_{CE}	650	V
DC Collector Current, Limited by T_{jmax}	T_C = +25°C	I_C	30	A
	T_C = +100°C		15	A
Pulsed Collector Current, t_p Limited by T_{jmax}		I_{Cpuls}	60	A
Diode Forward Current Limited by T_{jmax}	T_C = +25°C	I_F	30	A
	T_C = +100°C		15	A
Diode Pulsed Current, t_p Limited by T_{jmax}		I_{Fpuls}	60	A
Gate-Emitter Voltage		V_{GE}	±20	V
Short Circuit Withstand Time V_{CC} ≤ 360V, V_{GE} = 15V, T_j = +150°C		t_{SC}	5	µs

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

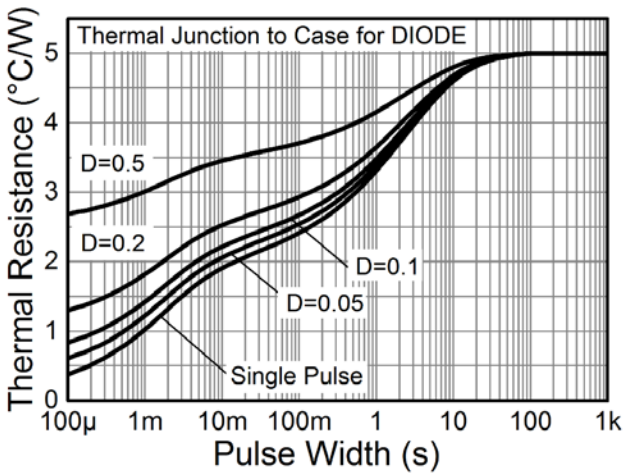
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor (Note 7)	T_C = +25°C	P_D	48	W
	T_C = +100°C		24	
Thermal Resistance, Junction to Ambient (Note 6)		$R_{\Theta JA}$	62	°C/W
Thermal Resistance, Junction to Case for IBGT (Note 7)		$R_{\Theta JC}$	3.0	
Thermal Resistance, Junction to Case for Diode (Note 7)		$R_{\Theta JC}$	5.0	
Operating Temperature		T_j	-40 to +175	°C
Storage Temperature Range		T_{STG}	-55 to +150	

Note: 6. For a device mounted in a socket in still air conditions. Collector lead length 10mm.
7. For a device mounted on a Force Cooled Aluminium Heatsink 80x80x60mm.

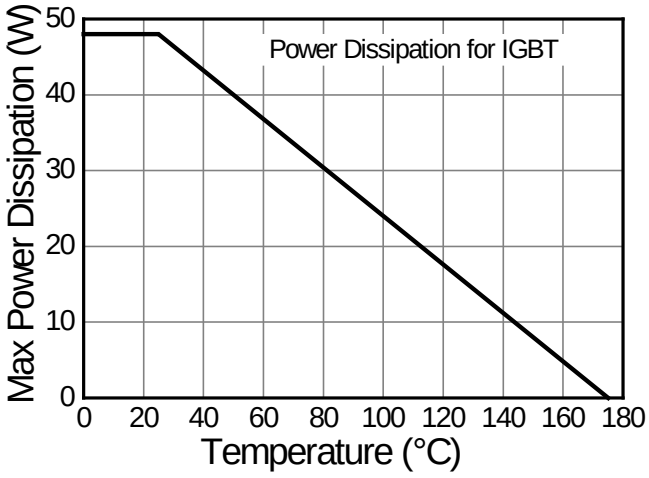
Thermal Characteristics and Derating Information



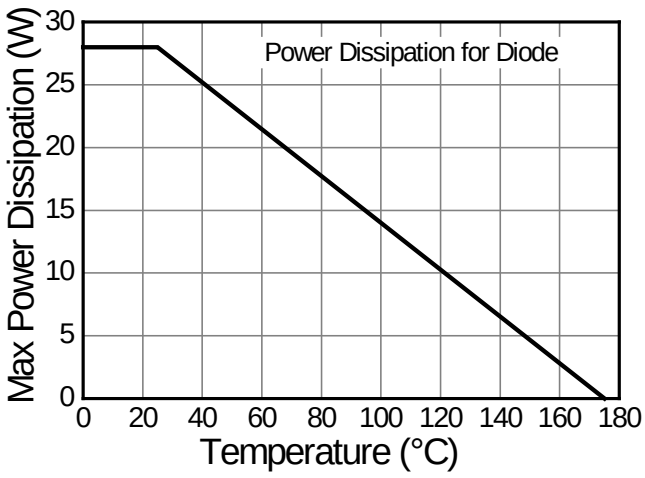
Transient Thermal Impedance



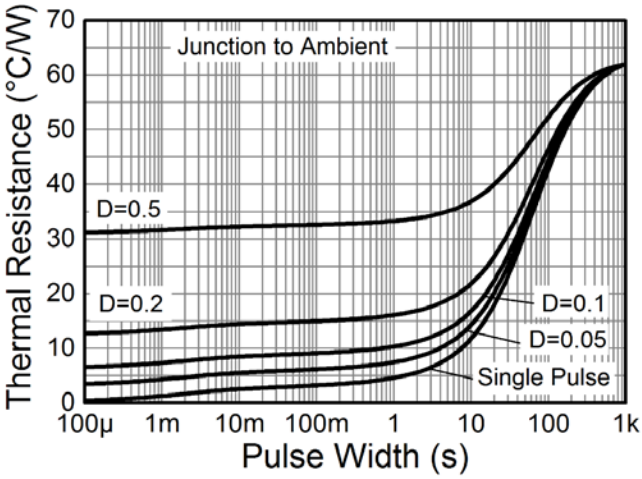
Transient Thermal Impedance



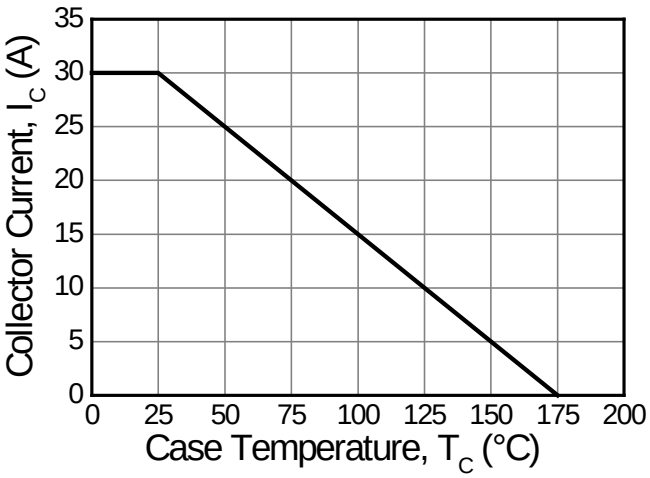
Derating Curve



Derating Curve



Transient Thermal Impedance



Case Temperature-Collector Current

Electrical Characteristics (@T_j = +25°C, unless otherwise specified.)

Parameter		Symbol	Min	Typ	Max	Unit	Condition
STATIC CHARACTERISTICS							
Collector-Emitter Breakdown Voltage		BV_{CES}	650	—	—	V	I_C = 2mA, V_{GE} = 0V
Collector-Emitter Saturation Voltage	T_j = +25°C	$V_{CE(sat)}$	—	1.65	2.00	V	I_C = 15A, V_{GE} = 15V
	T_j = +175°C		—	1.90	—		
Diode Forward Voltage	T_j = +25°C	V_F	—	1.85	2.30	V	V_{GE} = 0V, I_F = 15A
	T_j = +175°C		—	1.95	—		
Gate-Emitter Threshold Voltage		$V_{GE(th)}$	4.5	5.5	6.5	V	V_{CE} = V_{GE}, I_C = 0.5mA
Zero Gate Voltage Collector Current		I_{CES}	—	—	20	μA	V_{CE} = 650V, V_{GE} = 0V, T_j = +25°C
Gate-Emitter Leakage Current		I_{GES}	—	—	±100	nA	V_{GE} = 20V, V_{CE} = 0V
DYNAMIC CHARACTERISTICS							
Total Gate Charge		Q_g	—	61	—	nC	V_{CE} = 520V, I_C = 15A, V_{GE} = 15V
Gate-Emitter Charge		Q_{ge}	—	11	—		
Gate-Collector Charge		Q_{gc}	—	35	—		
Input Capacitance		C_{ies}	—	1129	—	pF	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz
Reverse Transfer Capacitance		C_{res}	—	57	—		
Output Capacitance		C_{oes}	—	31	—		
SWITCHING CHARACTERISTICS							
Turn-On Delay Time		$t_{d(on)}$	—	19	—	ns	V_{GE} = 15V, V_{CC} = 400V, I_C = 15A, R_G = 10Ω, Inductive Load, T_j = +25°C
Rise Time		t_r	—	27	—		
Turn-Off Delay Time		$t_{d(off)}$	—	128	—		
Fall Time		t_f	—	32	—		
Turn-On Switching Energy		E_{on}	—	270	—	μJ	
Turn-Off Switching Energy		E_{off}	—	86	—		
Total Switching Energy		E_{ts}	—	356	—		
Turn-On Delay Time		$t_{d(on)}$	—	17	—	ns	V_{GE} = 15V, V_{CC} = 400V, I_C = 15A, R_G = 10Ω, Inductive Load, T_j = +175°C
Rise Time		t_r	—	29	—		
Turn-Off Delay Time		$t_{d(off)}$	—	150	—		
Fall Time		t_f	—	130	—		
Turn-On Switching Energy		E_{on}	—	342	—	μJ	
Turn-Off Switching Energy		E_{off}	—	288	—		
Total Switching Energy		E_{ts}	—	630	—		
Reverse Recovery Time		t_{rr}	—	150	—	ns	I_F = 15A, di_F/dt = 200A/μs, T_j = +25°C
Reverse Recovery Current		I_{rr}	—	5.2	—	A	
Reverse Recovery Charge		Q_{rr}	—	390	—	nC	
Reverse Recovery Time		t_{rr}	—	207	—	ns	I_F = 15A, di_F/dt = 200A/μs, T_j = +175°C
Reverse Recovery Current		I_{rr}	—	6.1	—	A	
Reverse Recovery Charge		Q_{rr}	—	631	—	nC	

Typical Performance Characteristics (@T_A = +25°C, unless otherwise specified.)

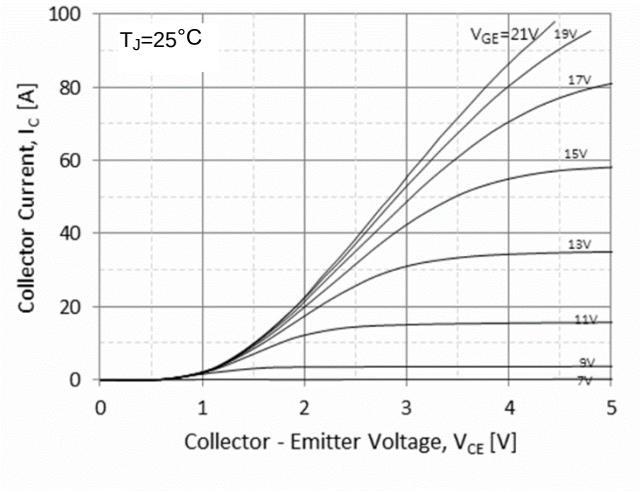


Fig.1 Typical Output Characteristics(T_J=25℃)

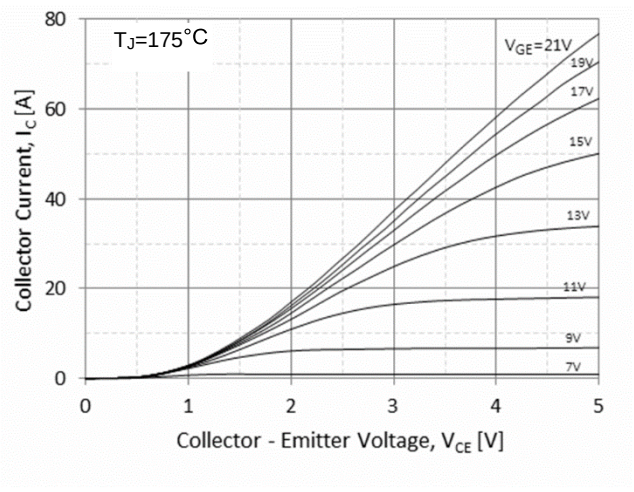


Fig.2 Typical Output Characteristics(T_J=175℃)

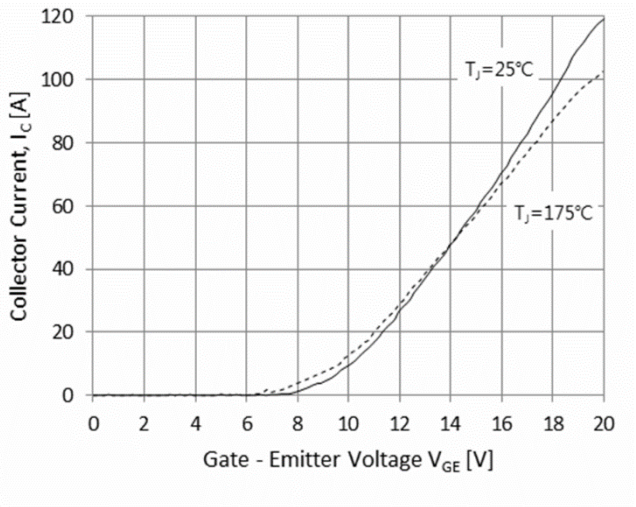


Fig.3 Typical Transfer Characteristics

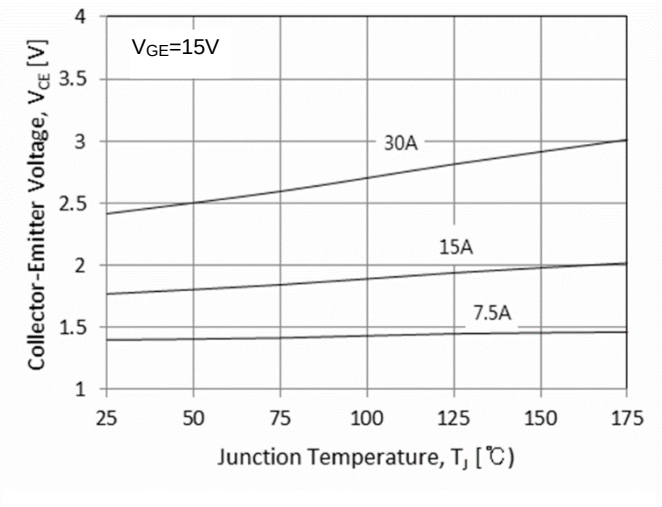


Fig.4 Typical Collector-Emitter Saturation Voltage -Junction Temperature

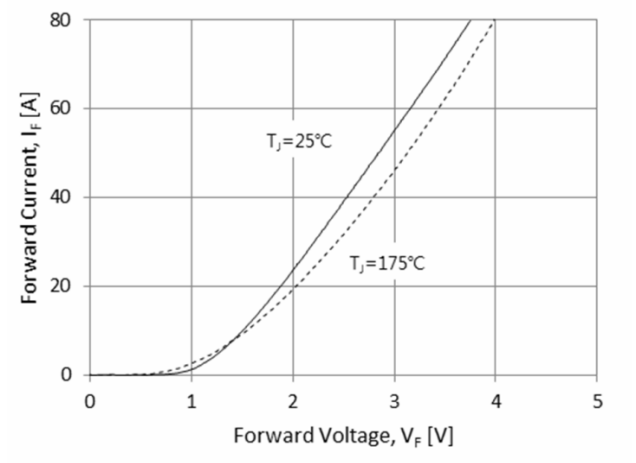


Fig.5 Diode Forward Characteristics

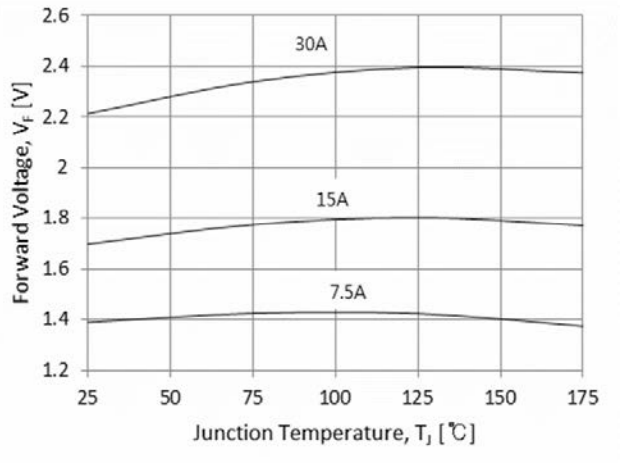


Fig.6 Diode Forward-Junction Temperature

Typical Performance Characteristics (@T_A = +25°C, unless otherwise specified.) (continued)

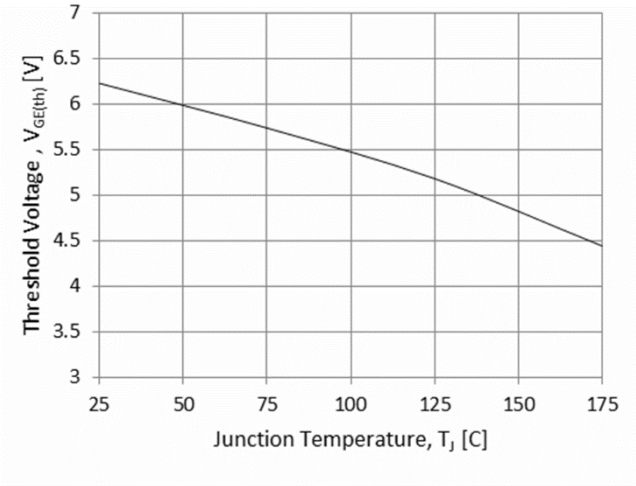


Fig.7 Threshold Voltage-Junction Temperature

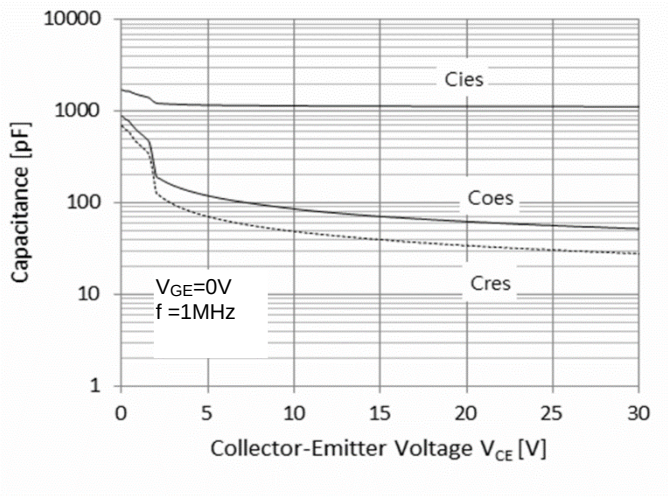


Fig.8 Typical Capacitance

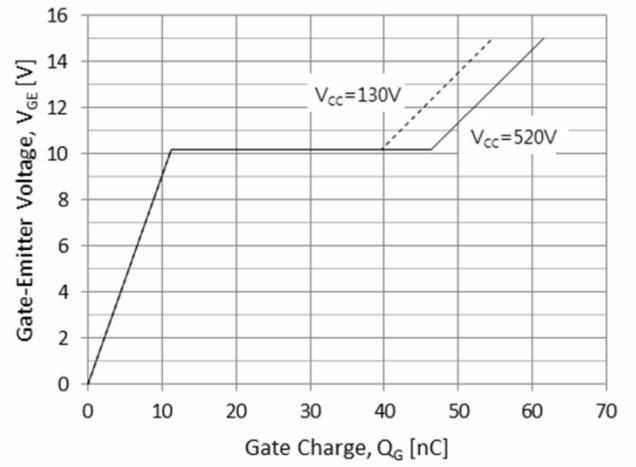


Fig.9 Typical Gate Charge

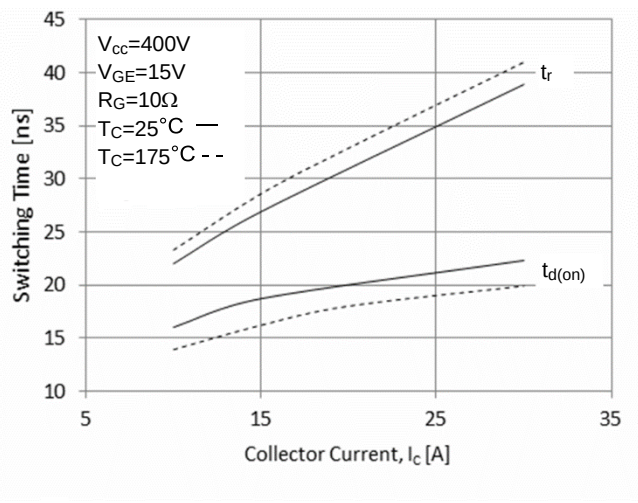


Fig.10 Typical Turn on-Collector Current

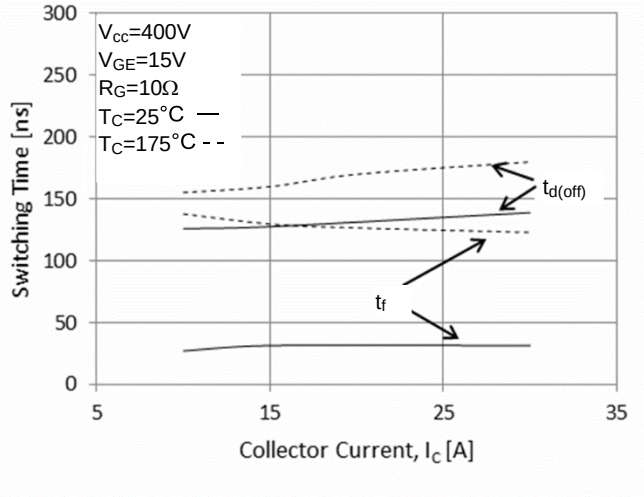


Fig.11 Typical Turn off-Collector Current

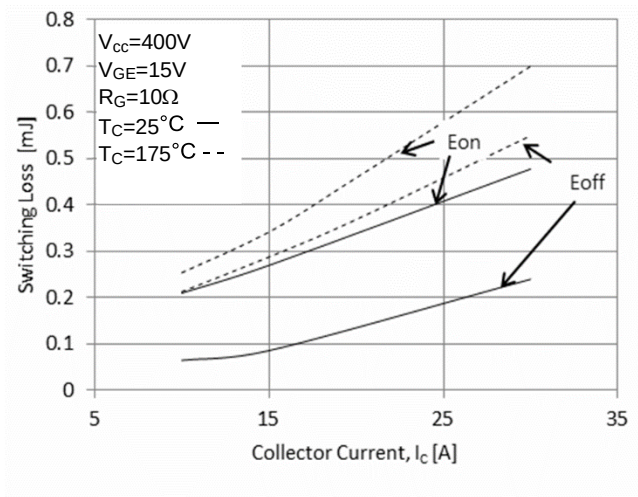


Fig.12 Switching Loss-Collector Current

Typical Performance Characteristics (@T_A = +25°C, unless otherwise specified.) (cont.)

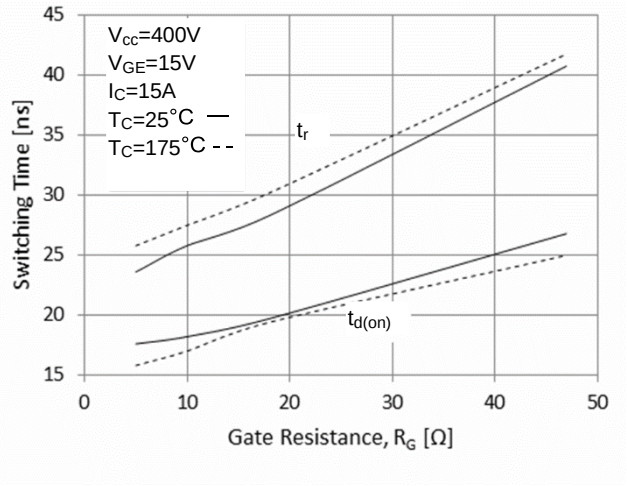


Fig.13 Turn on Characteristics-Gate Resistance

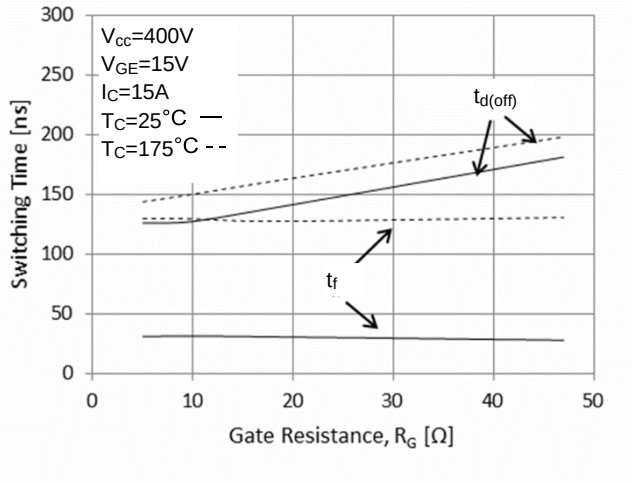


Fig.14 Turn off Characteristics-Gate Resistance

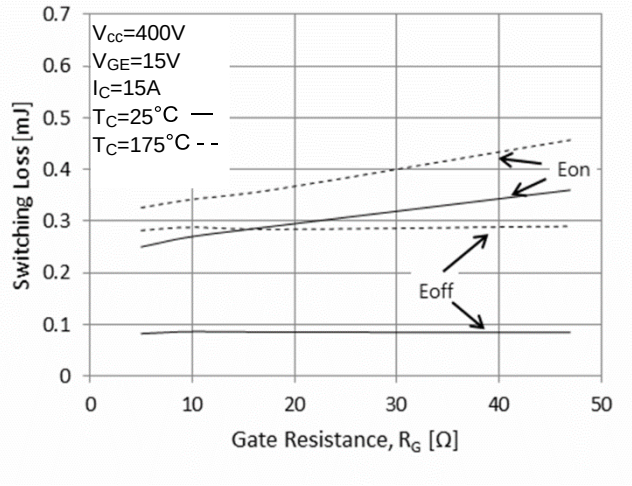


Fig.15 Switching Loss-Gate Resistance

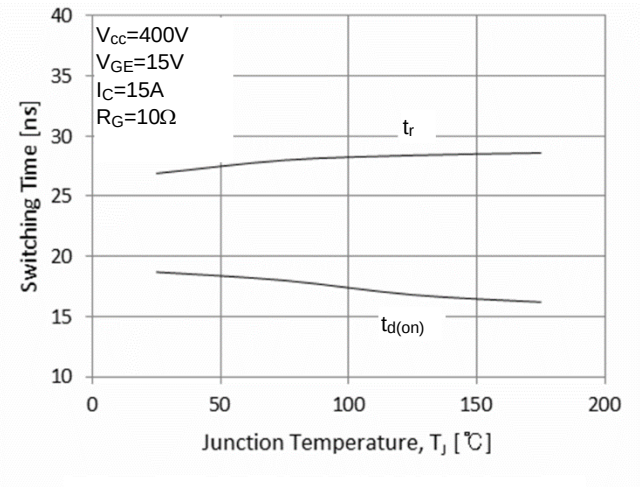


Fig.16 Turn on Characteristics-Junction Temperature

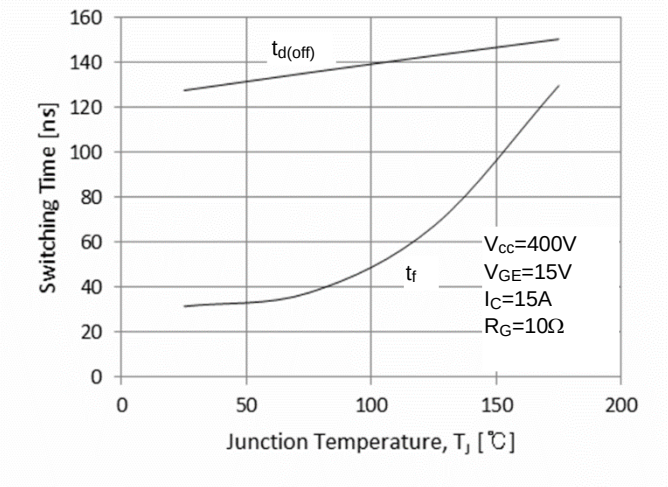


Fig.17 Turn off Characteristics-Junction Temperature

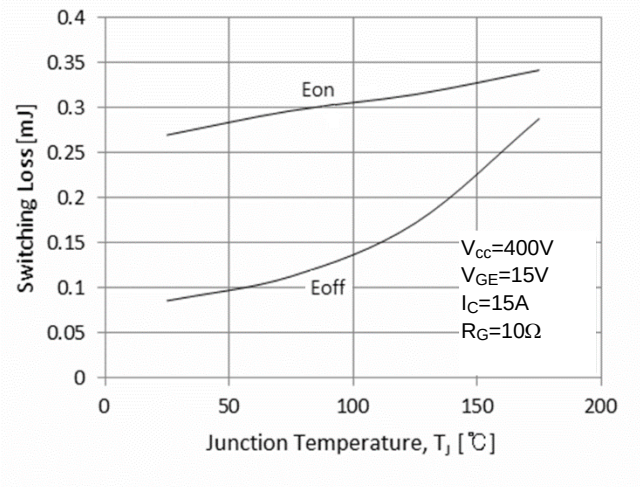
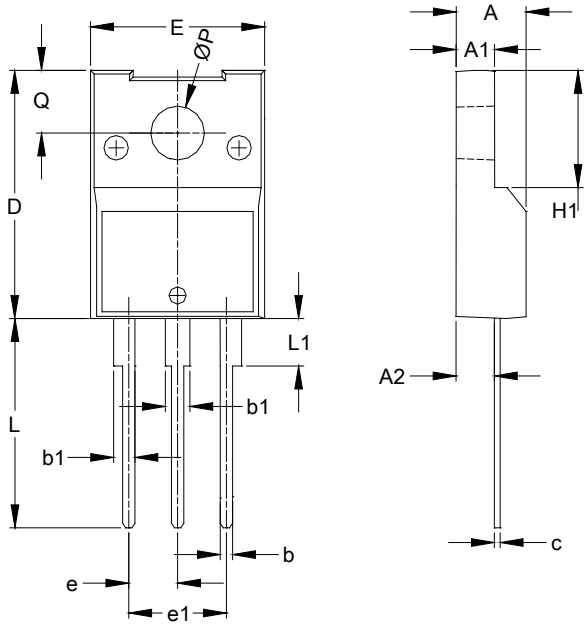


Fig.18 Switching Loss-Junction Temperature

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

ITO220AB (Type MC)



ITO220AB (Type MC)			
Dim	**Min**	**Max**	**Typ**
A	4.30	4.80	—
A1	2.50	3.10	—
A2	2.30	2.90	—
b	0.50	1.00	—
b1	0.95	1.70	—
c	0.40	0.80	—
D	14.50	16.40	—
H1	6.20	7.20	—
E	9.60	10.40	—
e	—	—	2.54
e1	—	—	5.08
L	12.20	14.20	—
L1	2.90	4.70	—
P	3.00	3.40	—
Q	2.40	3.50	—
All Dimensions in mm			

Note : For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.

IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes Incorporated.

LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or

2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

www.diodes.com

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Diodes Incorporated:

DGTD65T15H2TF