

Description

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

Features

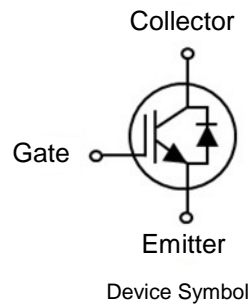
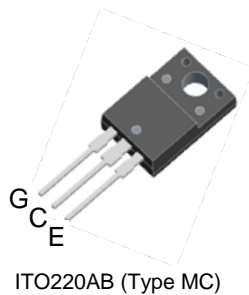
- High Ruggedness for Motor Control
- $V_{CE(sat)}$ Positive Temperature Coefficient
- Very Soft, Fast Recovery Anti-Parallel Diode
- Low EMI
- Maximum Junction Temperature +175°C
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

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
- Weight: 1.9 grams (Approximate)



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.)

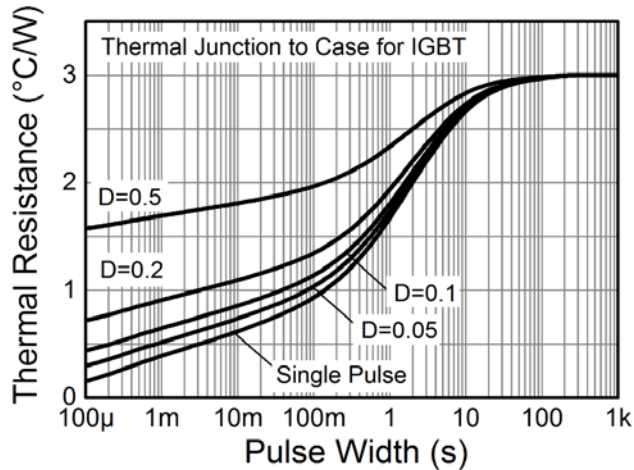
Characteristic	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CE}	650	V
DC Collector Current, Limited by T _{jmax}	I _C	T _C = +25°C	30
		T _C = +100°C	15
Pulsed Collector Current, t _p Limited by T _{jmax}	I _{Cpuls}	60	A
Diode Forward Current Limited by T _{jmax}	I _F	T _C = +25°C	30
		T _C = +100°C	15
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.)

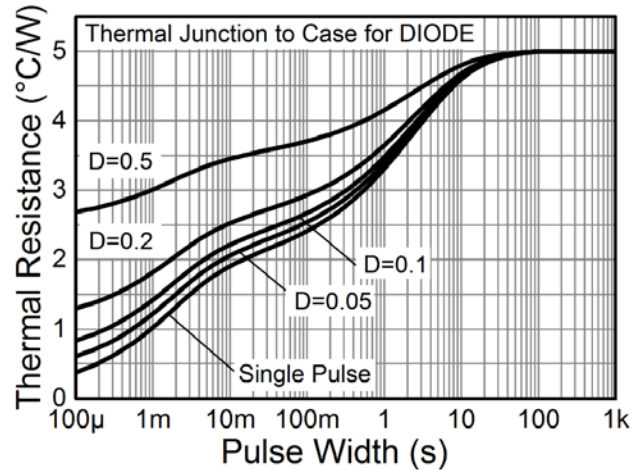
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor (Note 7)	P _D	T _C = +25°C	48
		T _C = +100°C	24
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	62	°C/W
Thermal Resistance, Junction to Case for IGBT (Note 7)	R _{θJC}	3.0	
Thermal Resistance, Junction to Case for Diode (Note 7)	R _{θJC}	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.

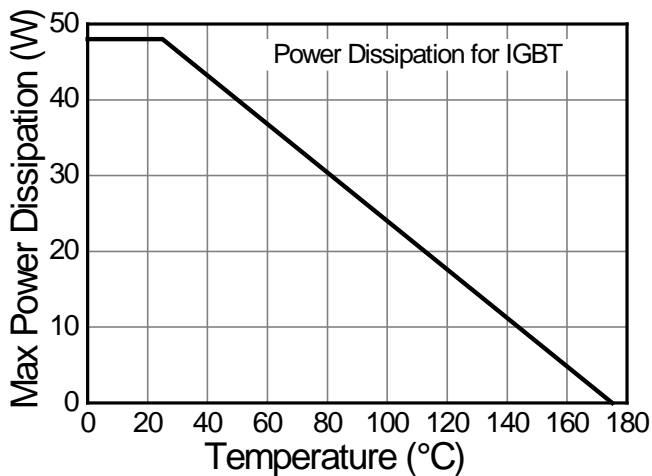
Thermal Characteristics and Derating Information



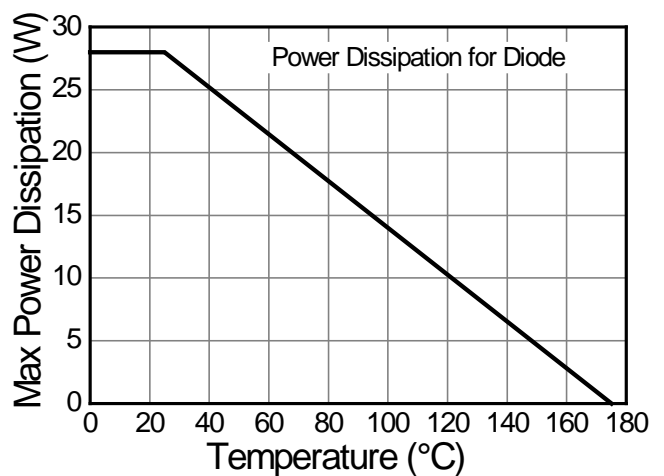
Transient Thermal Impedance



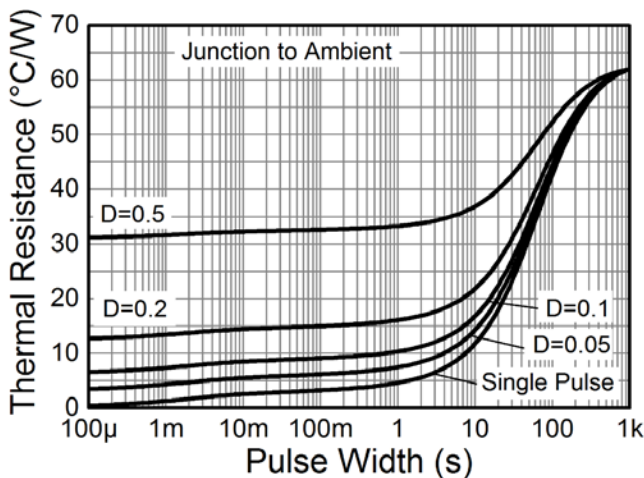
Transient Thermal Impedance



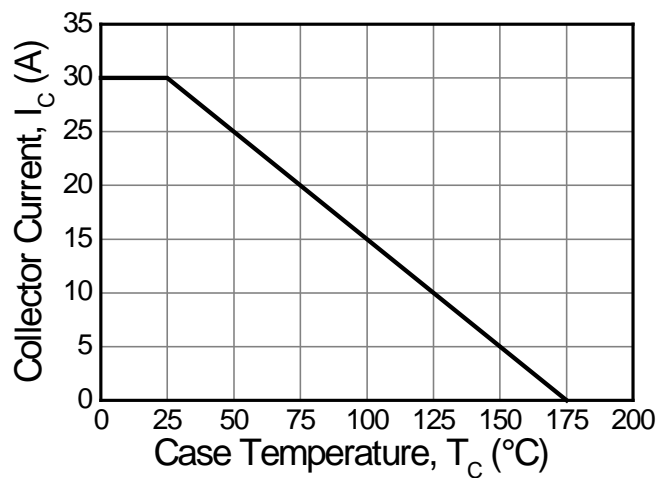
Derating Curve



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	V _{CE(sat)}	T _j = +25°C	—	1.65	2.00	V	I _C = 15A, V _{GE} = 15V
		T _j = +175°C	—	1.90	—		
Diode Forward Voltage	V _F	T _j = +25°C	—	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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

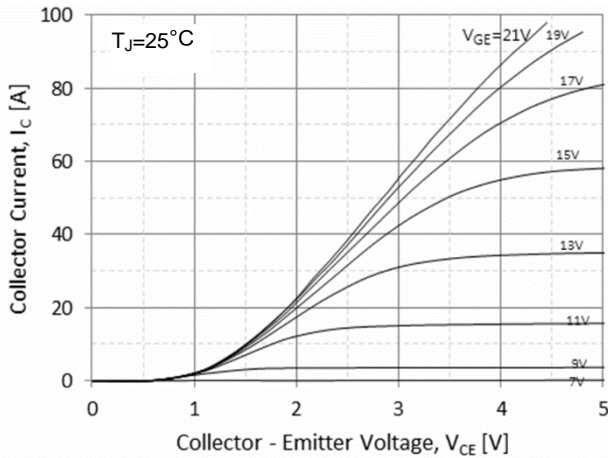


Fig.1 Typical Output Characteristics ($T_J = 25^\circ\text{C}$)

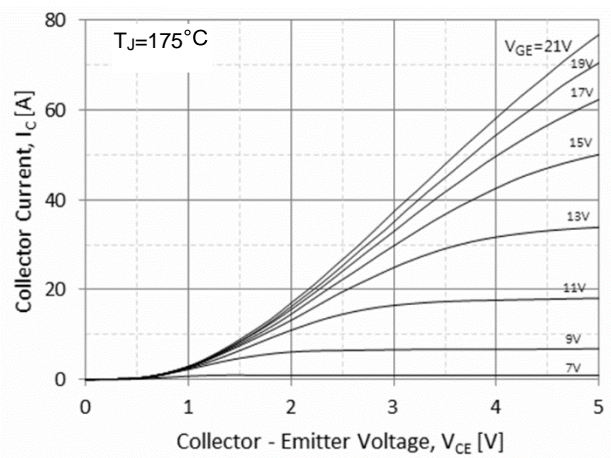


Fig.2 Typical Output Characteristics ($T_J = 175^\circ\text{C}$)

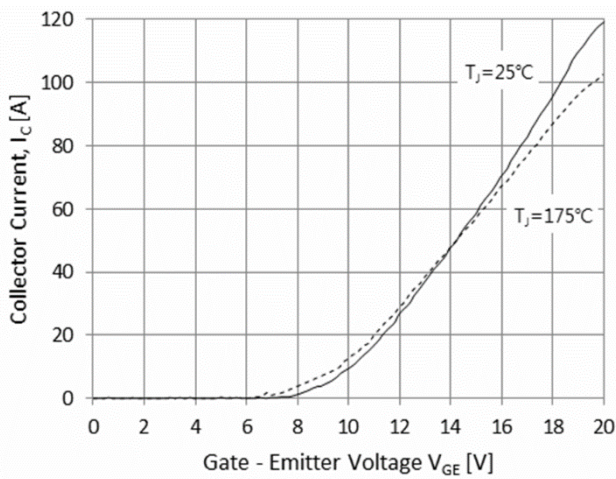


Fig.3 Typical Transfer Characteristics

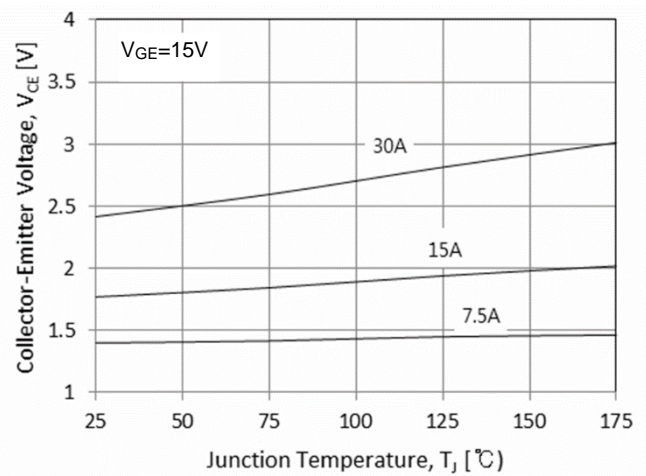


Fig.4 Typical Collector-Emitter Saturation Voltage - Junction Temperature

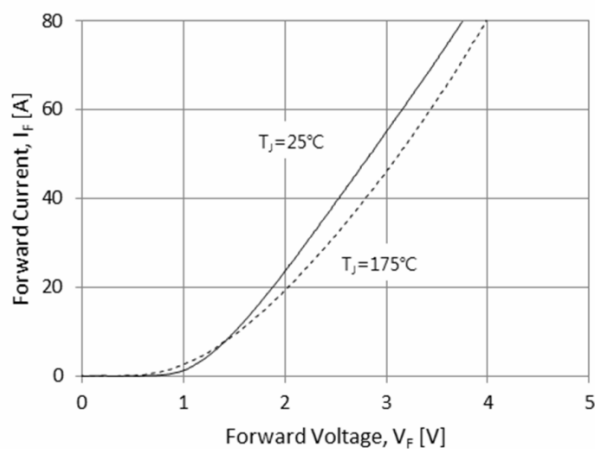


Fig.5 Diode Forward Characteristics

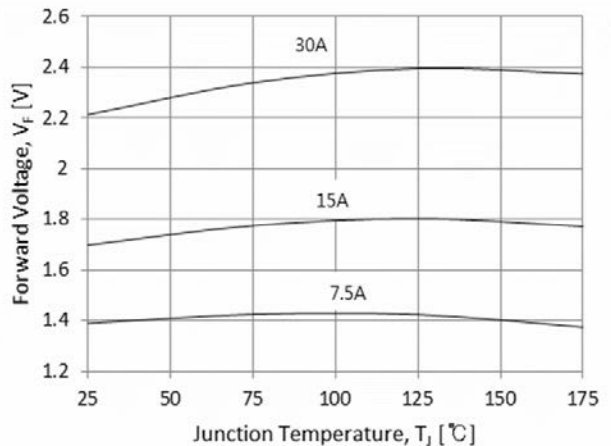


Fig.6 Diode Forward-Junction Temperature

Typical Performance Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.) (continued)

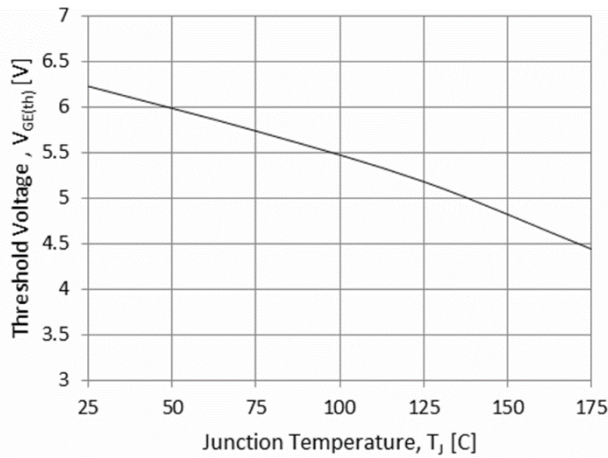


Fig.7 Threshold Voltage-Junction Temperature

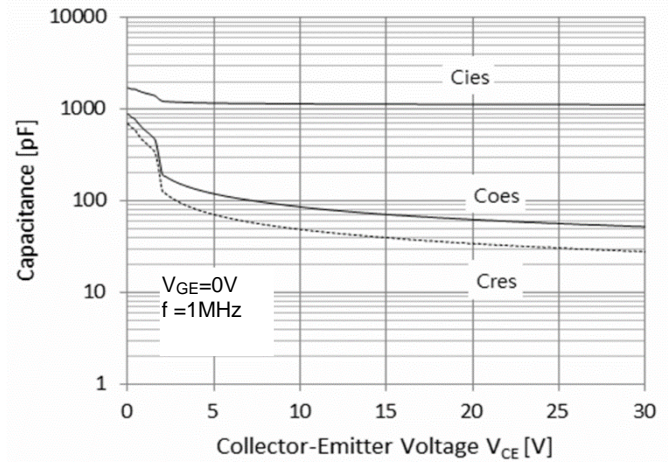


Fig.8 Typical Capacitance

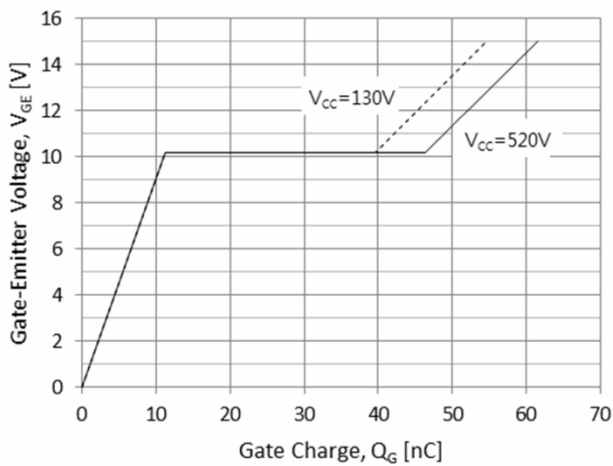


Fig.9 Typical Gate Charge

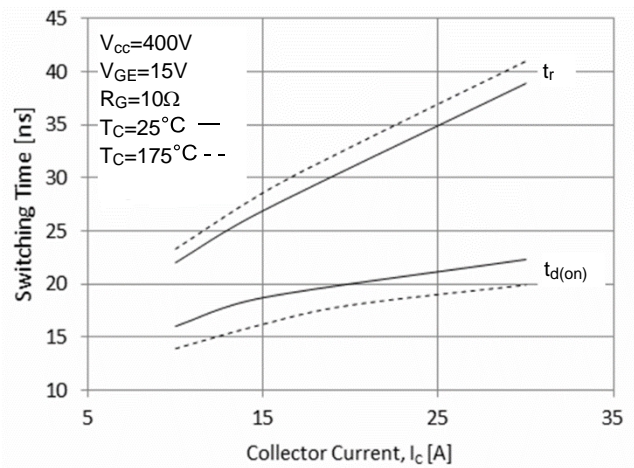


Fig.10 Typical Turn on-Collector Current

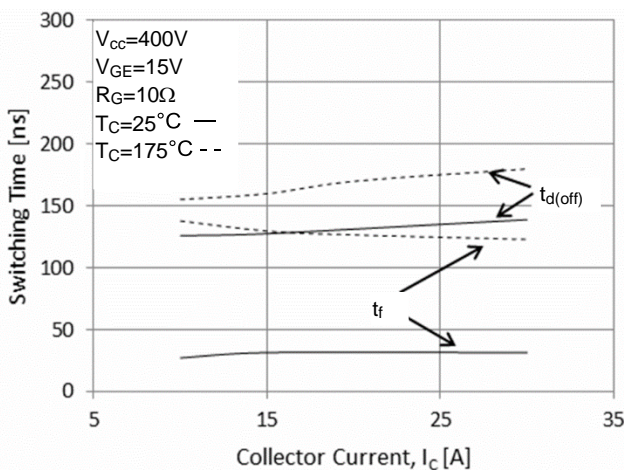


Fig.11 Typical Turn off-Collector Current

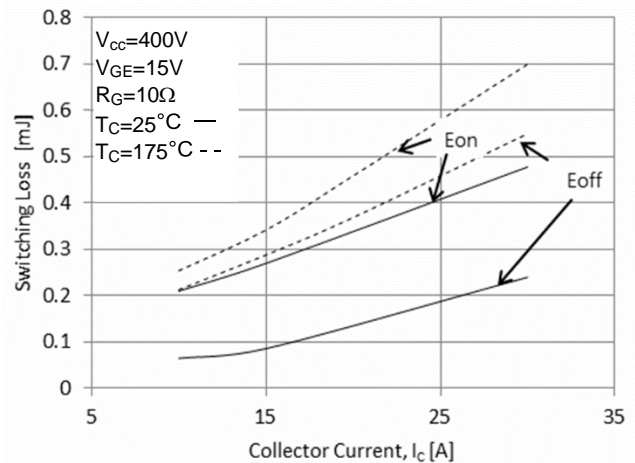


Fig.12 Switching Loss-Collector Current

Typical Performance Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.) (cont.)

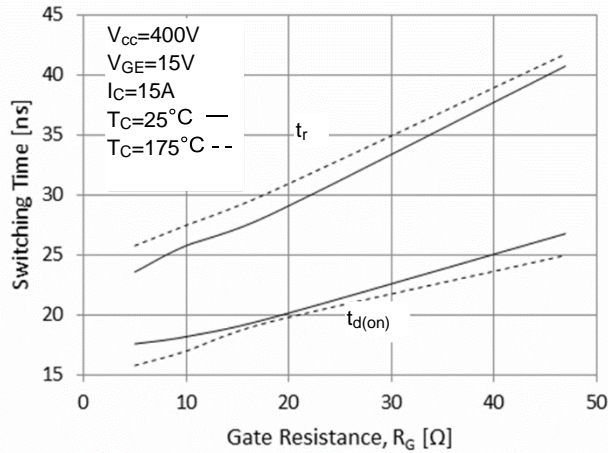


Fig.13 Turn on Characteristics-Gate Resistance

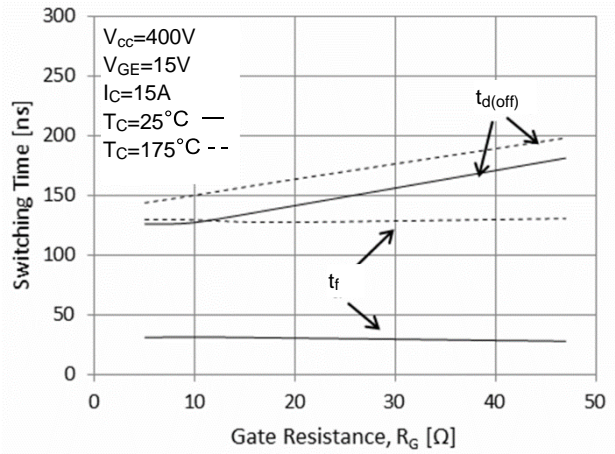


Fig.14 Turn off Characteristics-Gate Resistance

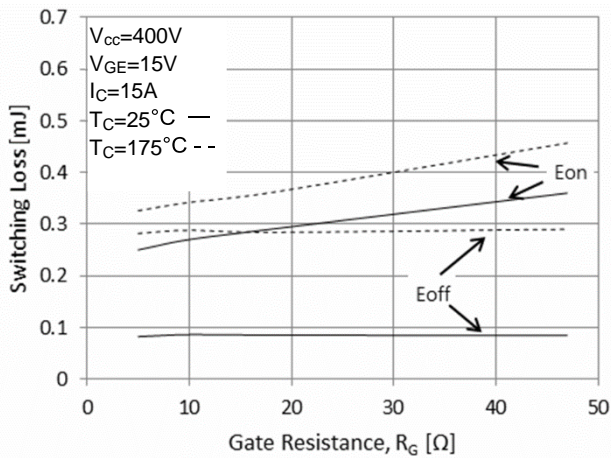


Fig.15 Switching Loss-Gate Resistance

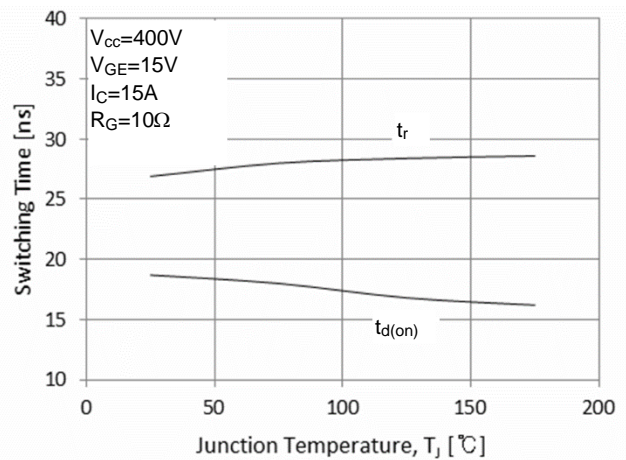


Fig.16 Turn on Characteristics-Junction Temperature

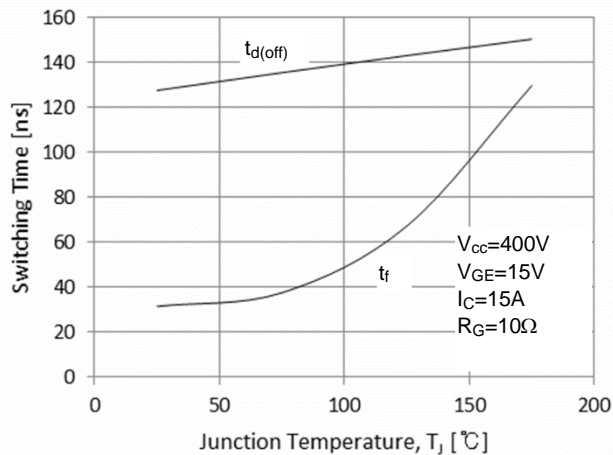


Fig.17 Turn off Characteristics-Junction Temperature

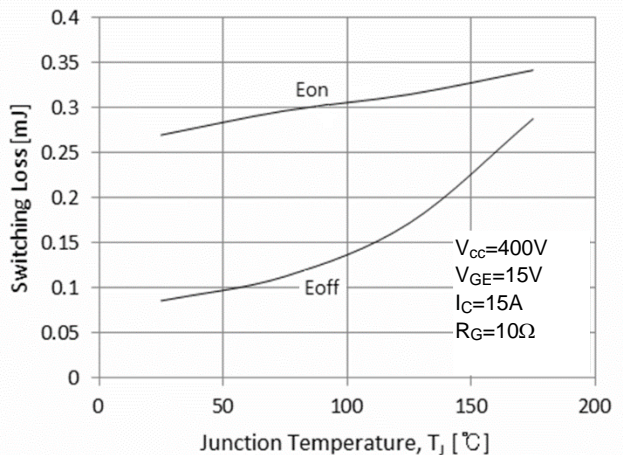
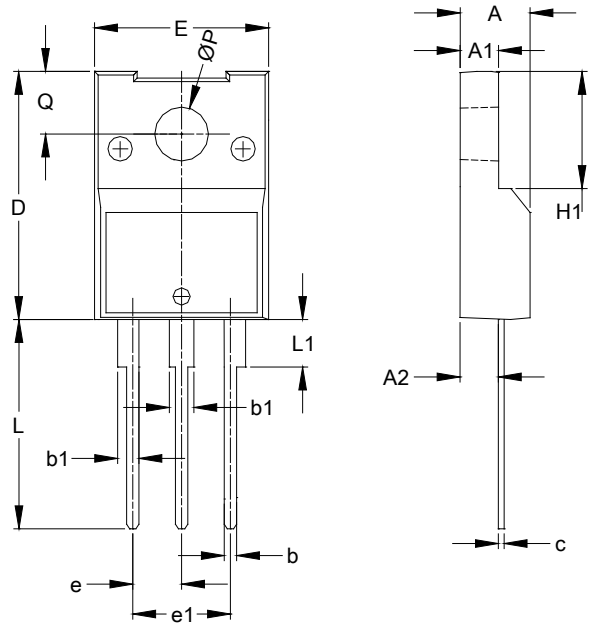


Fig.18 Switching Loss-Junction Temperature

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.

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