DGTD65T15H2TF

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)**

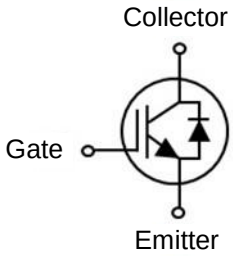
Applications

- Motor Controls

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

Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
2. See http://www.diodes.com/quality/lead_free.html 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/.

Marking Information

= Manufacturer's Marking
DGTD65T15H2 = Product Type Marking Code
YY = Year (ex: 17 = 2017)
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_{vjmax}	T_C = +25°C	I_C	30	A
	T_C = +100°C		15	A
Pulsed Collector Current, t_p Limited by T_{vjmax}		I_{Cpuls}	60	A
Diode Forward Current Limited by T_{vjmax}	T_C = +25°C	I_F	30	A
	T_C = +100°C		15	A
Diode Pulsed Current, t_p Limited by T_{vjmax}		I_{Fpuls}	60	A
Gate-Emitter Voltage		V_{GE}	±20	V
Short Circuit Withstand Time $V_{CC} \leq 360V$, V_{GE} = 15V, T_{vj} = +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 5)	T_C = +25°C	P_D	48	W
	T_C = +100°C		24	
Thermal Resistance, Junction to Ambient (Note 5)		$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction to Case for IBGT (Note 5)		$R_{\theta JC}$	3.0	
Thermal Resistance, Junction to Case for Diode (Note 5)		$R_{\theta JC}$	5.0	
Operating Temperature		T_{vj}	-40 to +175	°C
Storage Temperature Range		T_{STG}	-55 to +150	

Note: 5. When mounted on a standard JEDEC 2-layer FR-4 board.

Electrical Characteristics (@T_{vj} = +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_{vj} = +25°C	$V_{CE(sat)}$	–	1.65	2.00	V	I_C = 15A, V_{GE} = 15V
	T_{vj} = +175°C		–	1.90	–		
Diode Forward Voltage	T_{vj} = +25°C	V_F	–	1.85	2.30	V	V_{GE} = 0V, I_F = 15A
	T_{vj} = +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_{vj} = +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_{vj} = +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_{vj} = +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_{vj} = +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_{vj} = +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.)

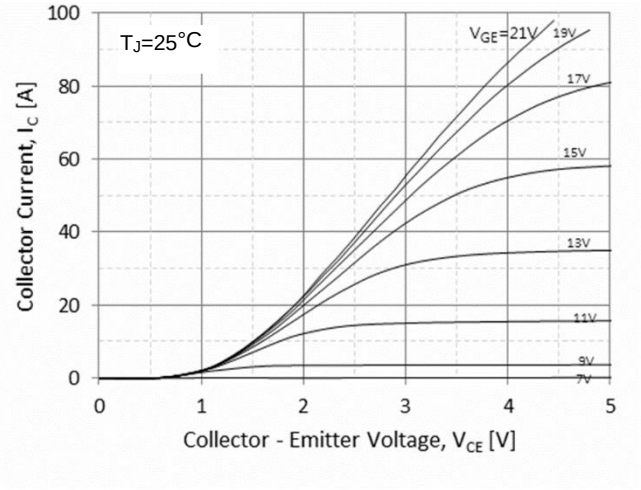


Fig.1 Typical Output Characteristics(T_J=25℃)

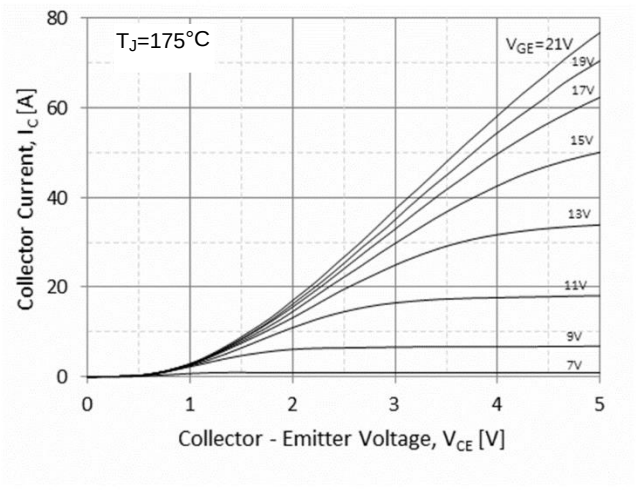


Fig.2 Typical Output Characteristics(T_J=175℃)

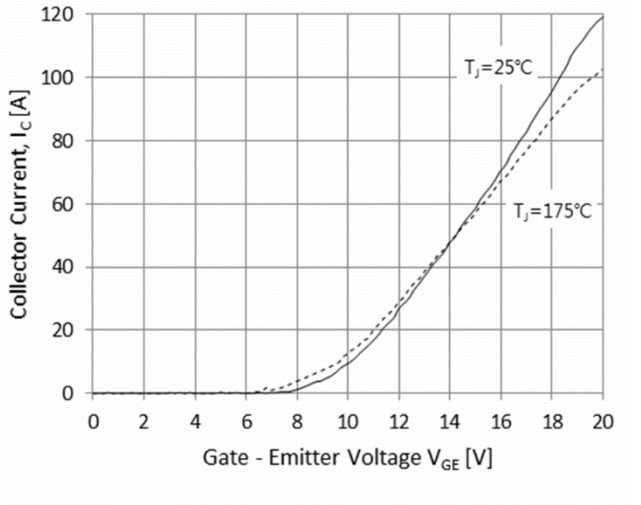


Fig.3 Typical Transfer Characteristics

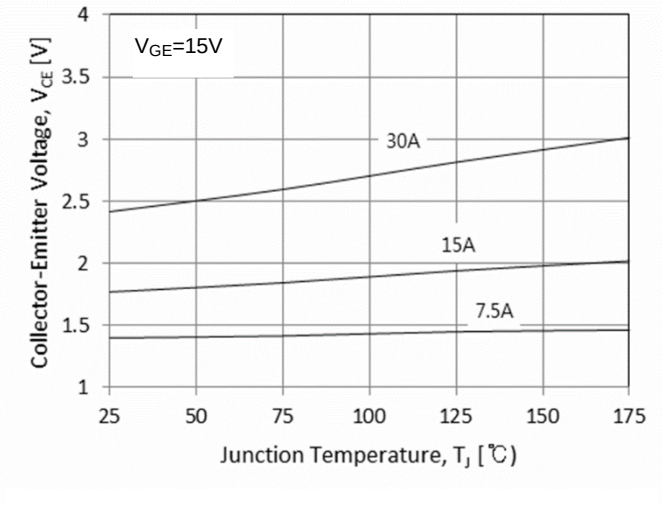


Fig.4 Typical Collector-Emitter Saturation Voltage -Junction Temperature

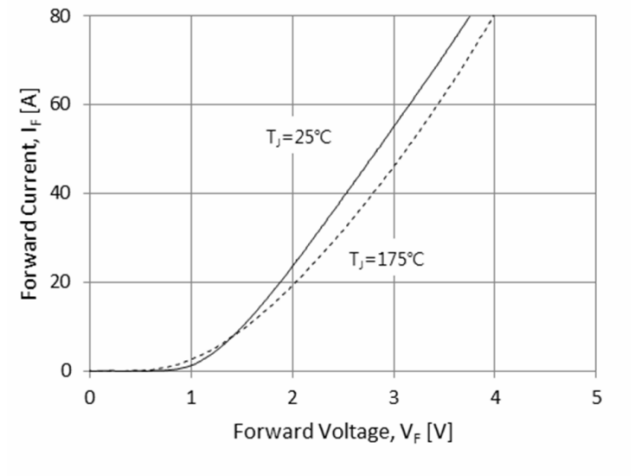


Fig.5 Diode Forward Characteristics

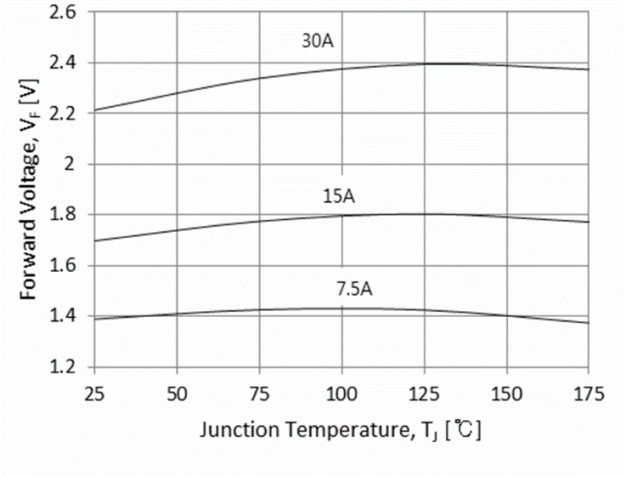


Fig.6 Diode Forward-Junction Temperature

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

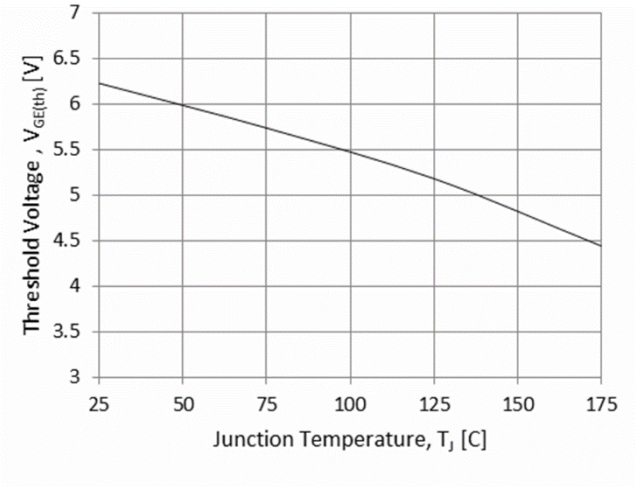


Fig.7 Threshold Voltage-Junction Temperature

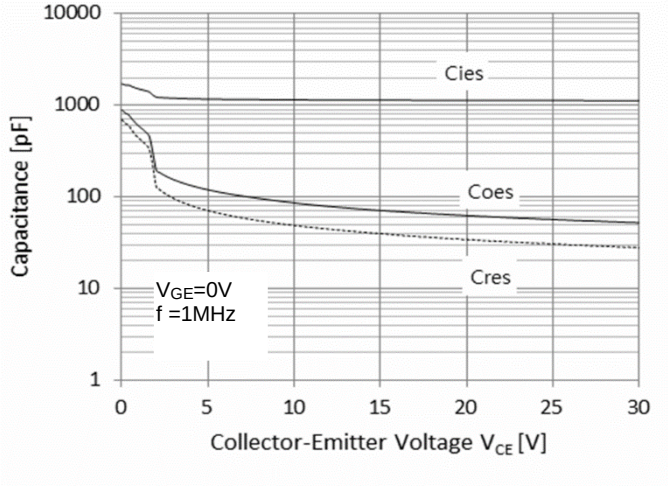


Fig.8 Typical Capacitance

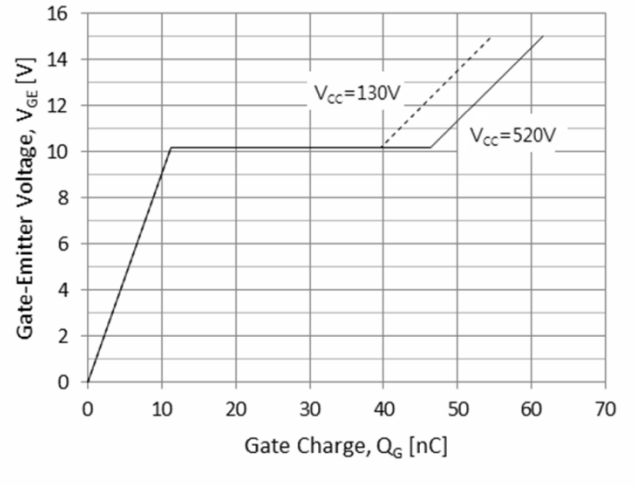


Fig.9 Typical Gate Charge

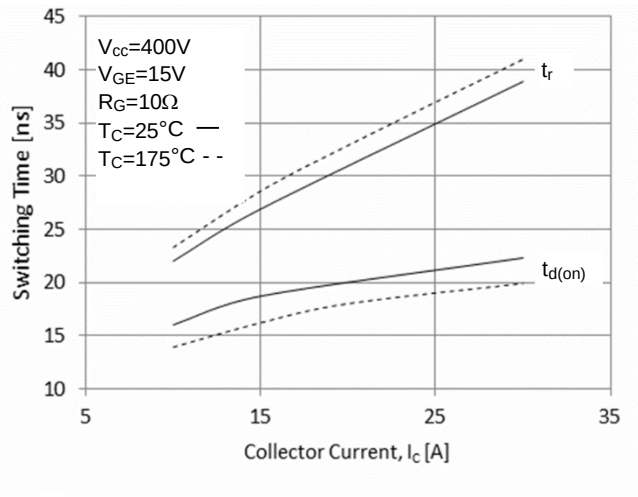


Fig.10 Typical Turn on-Collector Current

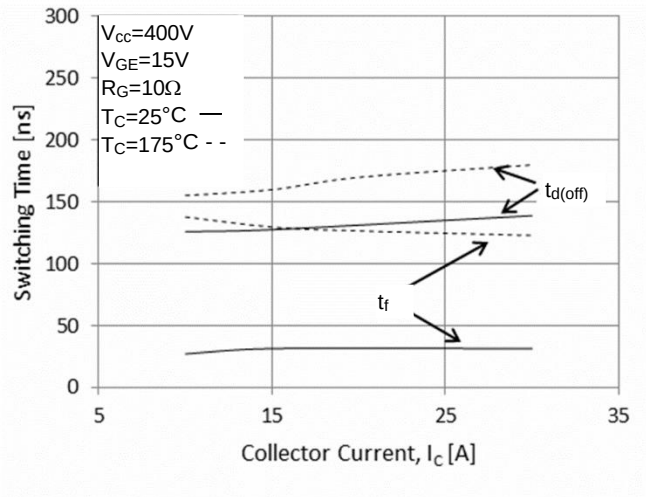


Fig.11 Typical Turn off-Collector Current

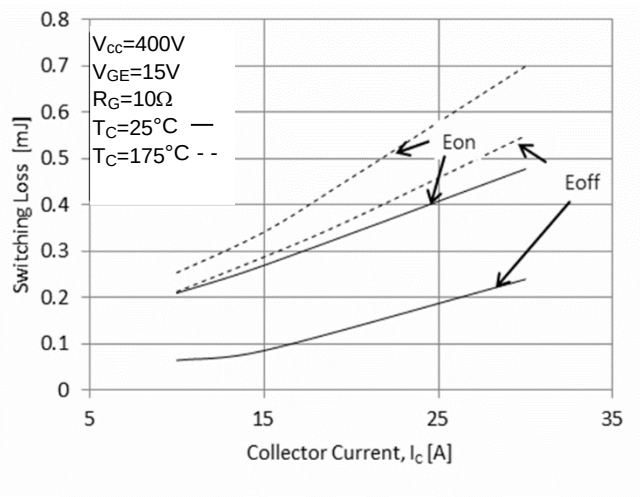


Fig.12 Switching Loss-Collector Current

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

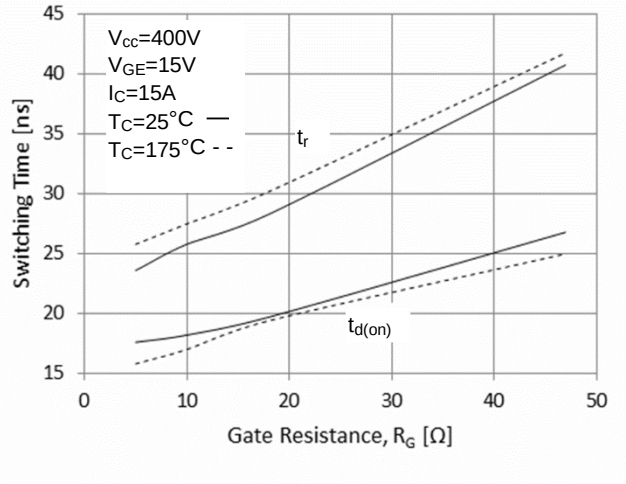


Fig.13 Turn on Characteristics-Gate Resistance

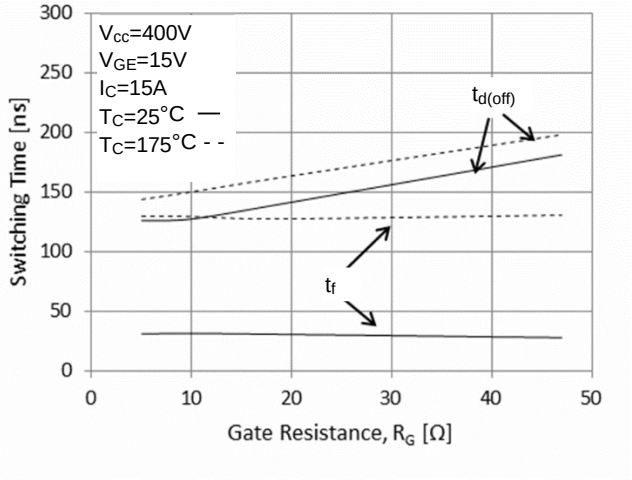


Fig.14 Turn off Characteristics-Gate Resistance

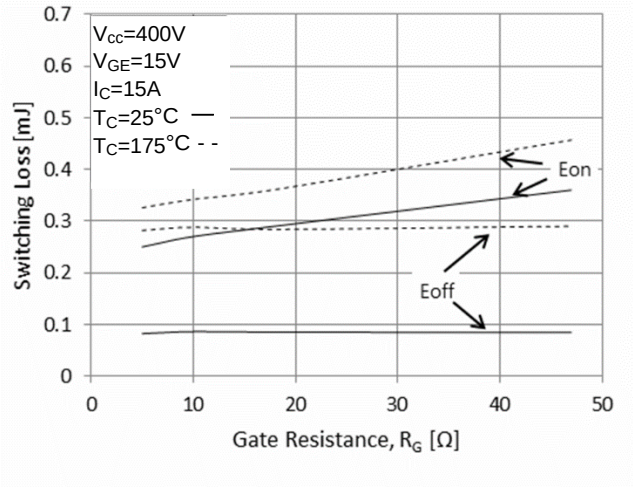


Fig.15 Switching Loss-Gate Resistance

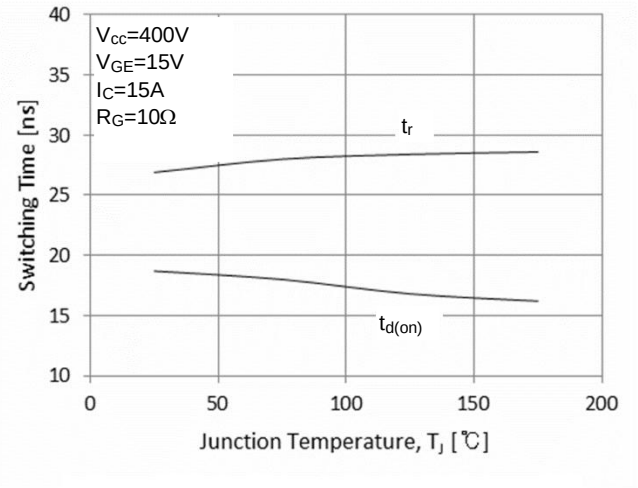


Fig.16 Turn on Characteristics-Junction Temperature

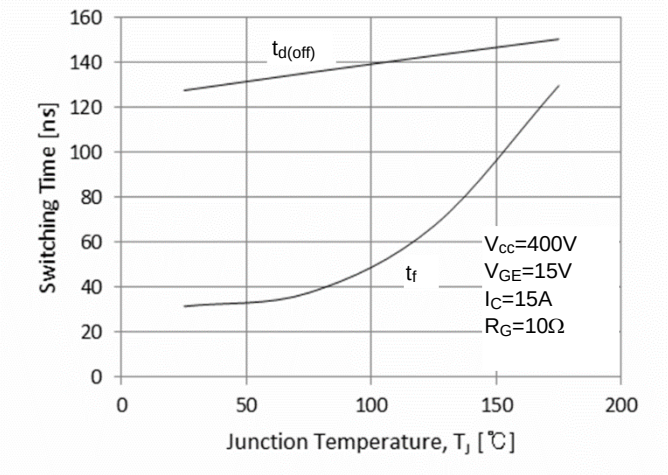


Fig.17 Turn off Characteristics-Junction Temperature

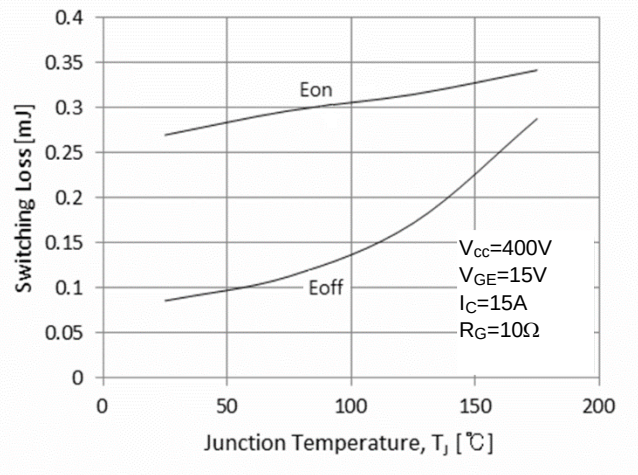


Fig.18 Switching Loss-Junction Temperature

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

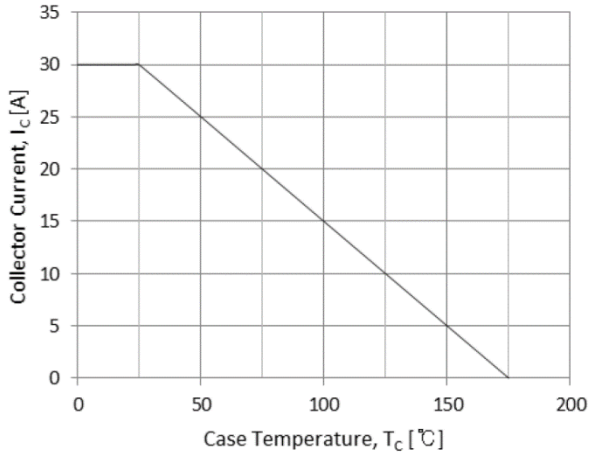
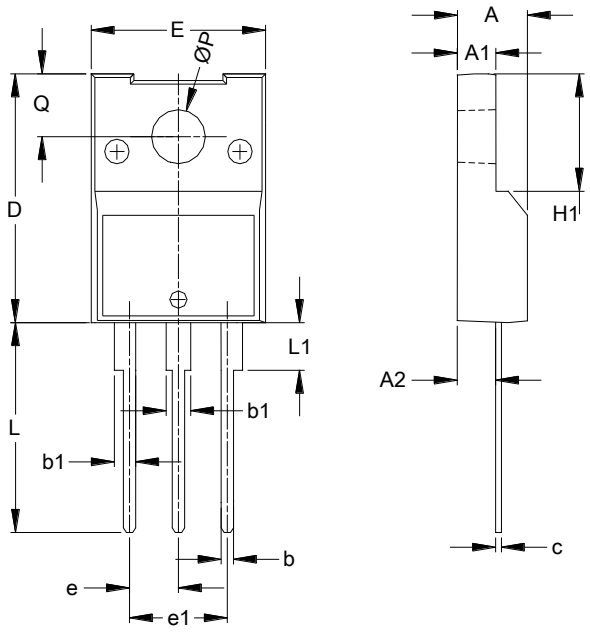


Fig.19 Case Temperature-Collector Current

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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