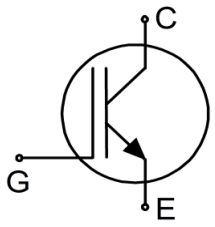
EDT3 IGBT for Automotive Applications

IGBT

Quality Requirement Category: Automotive



Features

- 750V trench + field stop technology
- Low $V_{CE(sat)}$
- Low switching losses
- Short tail current
- Positive temperature coefficient
- Integrated gate resistor
- Easy paralleling
- 185°C maximum junction temperature

Applications

- Drives

Description

- Recommended for power modules

Product Validation

- Technology qualified for Automotive Applications. Product validation according to AEC-Q101.

Key Performance Parameters

Chip Type	V_{CE}	I_{Cn}	Die Size	Package
IGC100T75H12RYA	750V	320A	99.93mm²	Sawn on foil

Table of Contents

1 Parameters and Characteristics

Table 1 Mechanical Parameters

Raster size		9.27 x 10.78	mm^2
Area total		99.93	mm^2
Emitter pad size		See chip drawing	
Gate pad size		See chip drawing	
Silicon thickness		77	µm
Wafer size		300	mm
Maximum possible chips per wafer		612	
Passivation frontside		Photoimide	
Pad metal		AlCu	
Backside metal		Ni Ag system	
Die bond[1]		Soft solder	
Frontside interconnect[1]		Wire bond: Al, ≤ 500 µm	
Reject ink dot size		Inkless	
Storage environment (<6 months)	For original and sealed MBB bags[2]	Ambient atmosphere air, temperature 17°C – 25°C	

[1] Depending on customer specific assembly process

[2] https://www.infineon.com/dgdl/Storage_of_Products_Supplied_by_Infineon_Technologie.pdf?fileId=5546d461641369bf01643b95d8500011

Table 2 Maximum Ratings[1]

Parameter	Symbol	Conditions	Value	Unit
Collector-emitter voltage	V_{CES}	25°C ≤ T_{vj} ≤ 185°C	750	V
		T_{vj} = -40°C[2]	710	
DC collector current, limited by $T_{vj\,max}$	I_C		-[3]	A
Pulsed collector current, t_p limited by $T_{vj\,max}$	$I_{C,pulse}$		960	A
Gate-emitter voltage	V_{GE}		±20	V
Virtual junction temperature	T_{vj}		-40 ... +185	°C
Short circuit withstand time [4/5]	t_{sc}	V_{GE} ≤ 15V, V_{CC} ≤ 470V, T_{vj} ≤ 175°C	3	µs
		V_{GE} ≤ 15V, V_{CC} ≤ 470V, T_{vj} ≤ 185°C	2.5	
Reverse bias safe operating area	*RBSOA*	$I_{C,max}$ = 640A, $V_{CE,max}$ = V_{CES}, -40°C ≤ T_{vj} ≤ 185°C		

Table 3 Static Characteristics (Tested on Wafer), T_{vj}=25°C

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-emitter saturation voltage	V_{CEsat}	V_{GE} = 15V, I_C = 64A	-	0.94	1.03	V
Gate-emitter threshold voltage	$V_{GE(th)}$	I_C = 3.2mA, V_{GE} = V_{CE}	5.2	5.9	6.5	V
Zero gate voltage collector current	I_{CES}	V_{CE} = 750V, V_{GE} = 0V	-	-	100	µA
Gate-emitter leakage current	I_{GES}	V_{CE} = 0V, V_{GE} = 20V	-	-	600	nA
Integrated gate resistor	r_G		-	2	-	Ω

[1] Not subject to production test - verified by design/characterization.

[2] V_{CES} increases linearly between -40°C and 25°C.

[3] Depending on thermal properties of assembly.

[4] Allowed number of short circuits: <1000; time between short circuits: >1s.

[5] Depending on electrical design of assembly.

Table 4 Electrical Characteristics[1]

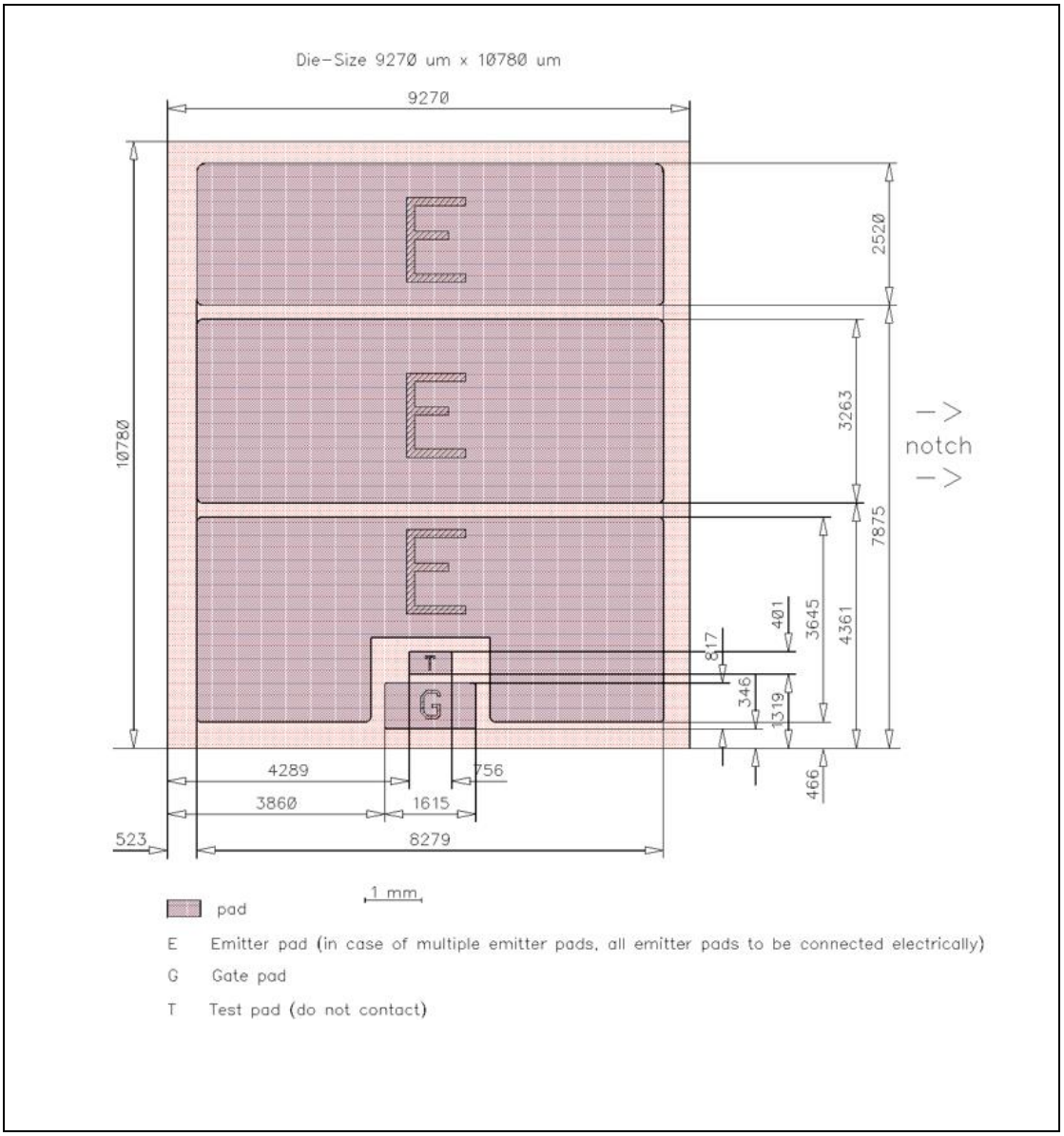
Parameter	Symbol	Conditions		Value			Unit
				min.	typ.	max.	
Collector-emitter saturation voltage	V_{CEsat}	V_{GE} = 15V, I_C = 200A	T_{vj} = 25°C	-	1.15	1.28	V
			T_{vj} = 185°C	-	1.2	-	
		V_{GE} = 15V, I_C = 320A	T_{vj} = 25°C	-	1.29	1.44	
			T_{vj} = 185°C	-	1.43	-	
Input capacitance	C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 100kHz T_{vj} = 25°C			18600		pF
Output capacitance	C_{oes}				670		
Reverse transfer capacitance	C_{res}				120		
Gate charge	Q_G	V_{CE} = 470V, I_C = 320A V_{GE} = -8V...+15V		-	820	-	nC

2 Further Electrical Characteristics

Note: Switching characteristics and thermal properties are dependent on module design and mounting technology and can therefore not be specified for a bare die.

[1] Not subject to production test - verified by design/characterization.

3 Chip Drawing



4 Bare Die Product Specifics

Note: Test coverage at wafer level for IGBTs cannot cover the full range of customer application conditions. Therefore it is the responsibility of the customer to test all performance characteristics, which are relevant for their specific application, at the package level, including RBSOA and SCSOA.

Description

- AQL 0.1 for visual inspection according to failure catalogue

Revision History

Document version	Date of release	Description of changes
V1.00	2025-March-06	Initial datasheet

Trademarks
All referenced product or service names and trademarks are the property of their respective owners.

Edition 2025-March-06

Published by

Infineon Technologies AG

81726 München, Germany

Do you have a question about this document?

Email: erratum@infineon.com

Document reference

Error! Unknown document property name.

IMPORTANT NOTICE

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics ("Beschaffenheitsgarantie").

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer's compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of Infineon Technologies in customer's applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

For further information on the product, technology delivery terms and conditions and prices please contact your nearest Infineon Technologies office (**www.infineon.com**).

WARNINGS

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.