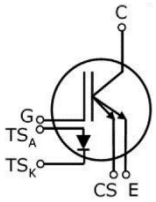
EDT3 IGBT for Automotive Applications

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 current mirror (current sensor)
- Integrated temperature sensor
- Solderable pads[1]
- 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
IGC110T75H12DCKYA	750V	320A	109.95 mm²	Sawn on foil

[1] Depending on customer specific assembly process

Table of Contents

1 Parameters and Characteristics

Table 1 Mechanical Parameters

Raster size		11.81 x 9.31	mm
Area total		109.95	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		554	
Passivation frontside		Photoimide	
Pad metal		NiP/Pd	
Backside metal		NiP/Pd	
Die bond[1]		Soft solder	
Frontside interconnect[1]		Soft solder	
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
Temperature sensor	$V_{f\,TS}$	I_{TS} = 200µA, T= 25°C	2.92	2.98	3.04	V

[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]

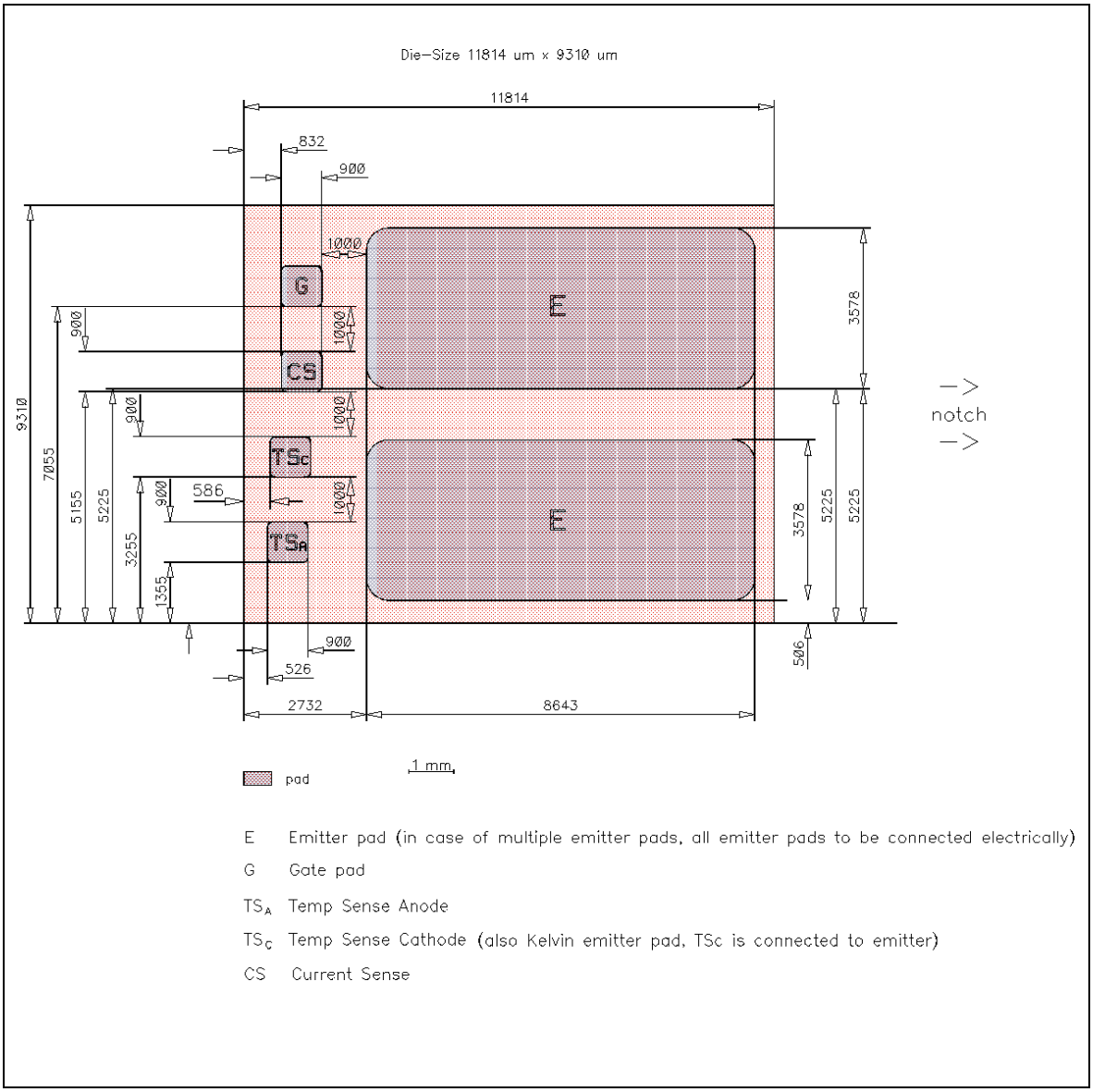
Parameter	Symbol	Conditions		Value			Unit
				min.	typ.	max.	
Collector-emitter saturation voltage	V_{cesat}	V_{GE} = 15V, I_C = 320A	T_{vj} = 25°C	-	1.29	1.44	V
			T_{vj} = 185°C	-	1.43	-	
Input capacitance	C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f=100kHZ T_{vj} = 25°C		-	18375	-	pF
Output capacitance	C_{oes}			-	680	-	
Reverse transfer capacitance	C_{res}			-	107	-	
Gate charge	Q_G	V_{CE} = 470V, I_C = 320A V_{GE} = -8V...+15V		-	901	-	nC
Current sensor Area ratio of active cells to sense cells	A_{load}/A_{cs}	Defined by design		-	7800	-	
Temperature sensor Temperature coefficient	c_{TS}	I_{TS} = 200µA		-	-8.16	-	mV/K

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	17-July-2025	Initial Datasheet
V1.10	10-September-2025	Changes of V_{ces}, T_{vj}, t_{SC}, RBSOA, V_{cesat} for 185°C

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