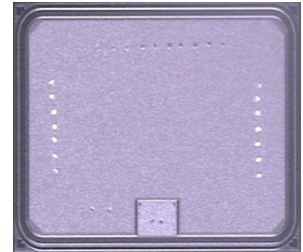


Field Stop IGBT Chip

FGY75N60SM

600V, 75A, $V_{CE(sat)} = 1.9V$

Part	V_{CES}	I_{Cn}	$V_{CE(sat)}$ Typ	Die Size
FGY75N60SMD	600V	75A	1.9	7.2 x 6.7 mm ²
See page 2 for ordering part numbers & supply formats				



Applications

- Inverter Modules
- Welding & Drive Applications

Features

- Low Saturation Voltage
- Fast Switching: $E_{OFF} = 10\mu A$
- Tightened Parameter Distribution

Maximum Ratings

Symbol	Parameter	Ratings	Units	
V_{CES}	Collector to Emitter Voltage	600	V	
V_{GES}	Gate to Emitter Voltage	± 20	V	
I_C	Collector Current ¹	Continuous ($T_C = 25^\circ C$)	150	A
		Continuous ($T_C = 100^\circ C$)	75	A
I_{CM}	Pulsed Collector Current	225	A	
T_J, T_{STG}	Operation Junction & Storage Temperature	-55 to 175	$^\circ C$	

Static Characteristics, $T_J = 25^\circ$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
BV_{CES}	Collector to Emitter Breakdown Voltage	$V_{GE} = 0V, I_C = 250\mu A$	600	-	-	V
I_{CES}	Collector Cut-Off Current	$V_{CE} = V_{CES}, V_{GE} = 0V$	-	-	250	μA
I_{GES}	G-E Leakage Current	$V_{GE} = V_{GES}, V_{CE} = 0V$	-	-	± 400	nA

On Characteristics, $T_J = 25^\circ C$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
$V_{GE(th)}$	G-E Threshold Voltage	$I_C = 250\mu A, V_{CE} = V_{GE}$	3.5	5.0	6.5	V
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage	$I_C = 75A, V_{GE} = 15V$	-	1.9	2.5	V
		$I_C = 75A, V_{GE} = 15V$ @ $175^\circ C$	-	2.14	-	V

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Dynamic Characteristics², T_J = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
C _{ies}	Input Capacitance	V _{CE} = 30V, V _{GE} = 0V f = 1MHz	-	3800	-	pF
C _{oes}	Output Capacitance		-	390	-	
C _{res}	Reverse Transfer Capacitance		-	105	-	
Q _g	Total Gate Charge	V _{CE} = 400V, I _C = 75A V _{GE} = 15V	-	248	-	nC
Q _{ge}	Gate to Emitter Charge		-	28	-	
Q _{gc}	Gate to Collector Charge		-	129	-	

Switching Characteristics³, T_J = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
t _{d(on)}	Turn-On Delay Time	V _{CC} = 400V, I _C = 75A R _G = 3Ω, V _{GE} = 15V Inductive Load, T _C = 25°C	-	24	-	ns
t _r	Rise Time		-	56	-	ns
t _{d(off)}	Turn-Off Delay Time		-	136	-	ns
t _f	Fall Time		-	22	-	ns
E _{on}	Turn-On Switching Loss		-	2.3	-	mJ
E _{off}	Turn-Off Switching Loss		-	0.77	-	mJ
E _{ts}	Total Switching Loss		-	3.07	-	mJ
t _{d(on)}	Turn-On Delay Time	V _{CC} = 400V, I _C = 75A R _G = 3Ω, V _{GE} = 15V Inductive Load, T _C = 175°C	-	23	-	ns
t _r	Rise Time		-	53	-	ns
t _{d(off)}	Turn-Off Delay Time		-	146	-	ns
t _f	Fall Time		-	15	-	ns
E _{on}	Turn-On Switching Loss		-	3.60	-	mJ
E _{off}	Turn-Off Switching Loss		-	1.11	-	mJ
E _{ts}	Total Switching Loss		-	4.71	-	mJ

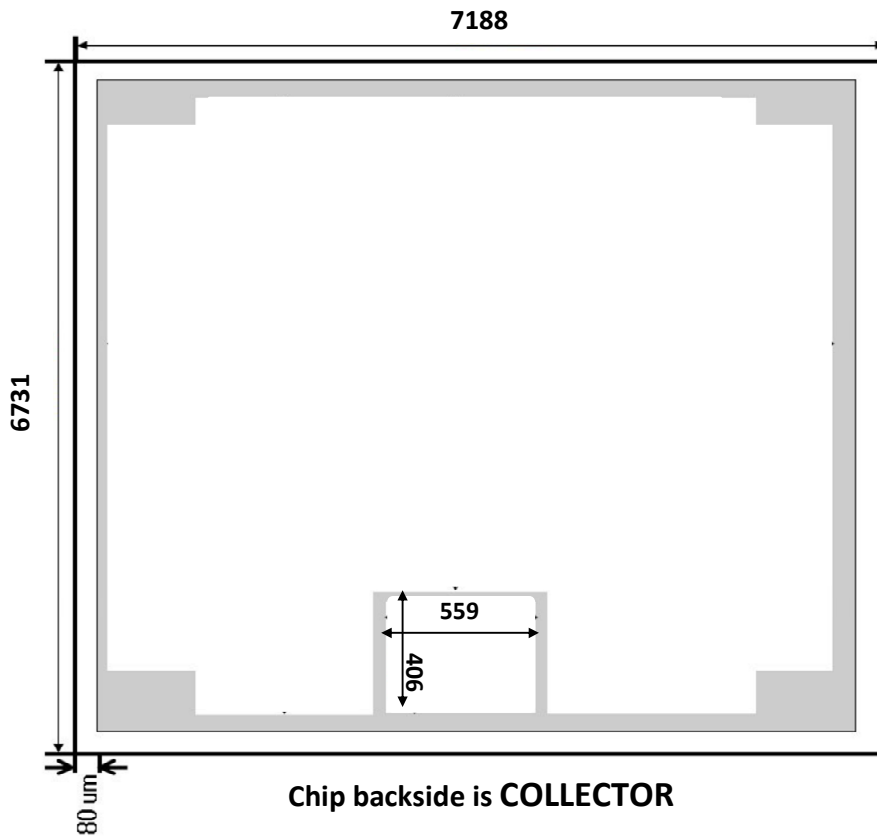
Notes:

1. Performance will vary based on assembly technique and substrate choice
2. Defined by chip design, not subject to 100% production test at wafer level
3. Specified in discrete package for indicative purposes only, bare die performance will vary depending on module design.

Ordering Guide

Part Number	Format	Detail / Drawing
FGY75N60SMMW	Un-sawn wafer, electrical rejects inked	Page 3
FGY75N60SMMF	Sawn wafer on film-frame	Page 4
FGY75N60SMMD	Singulated die / chips in waffle pack	Page 4
Note: Singulated Die / Chips can also be supplied in Pocket Tape or SurfTape® on request		

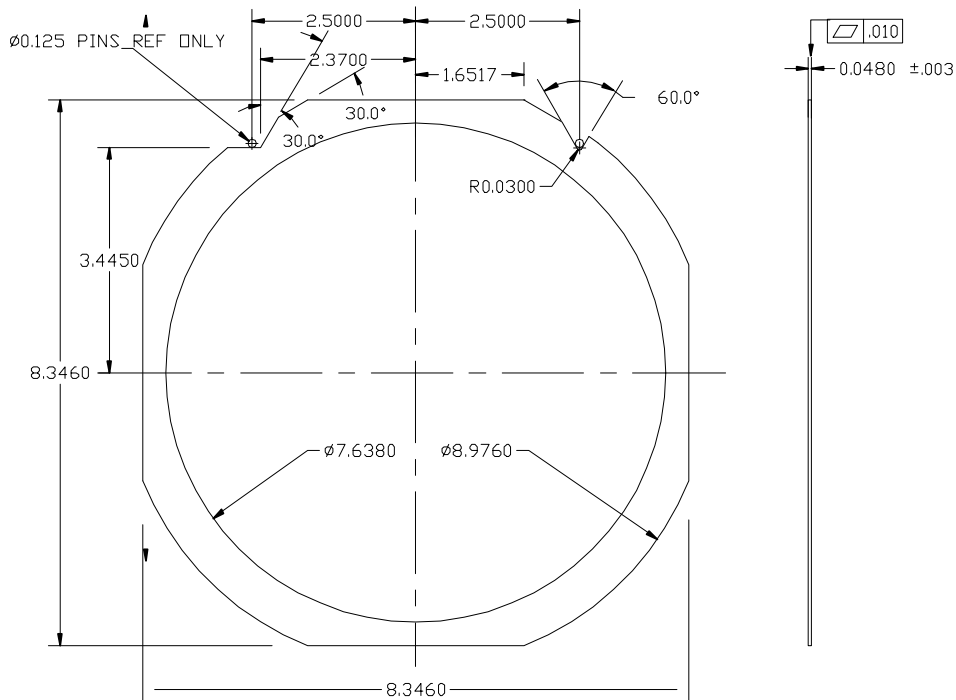
Die Drawing – Dimensions (µm)



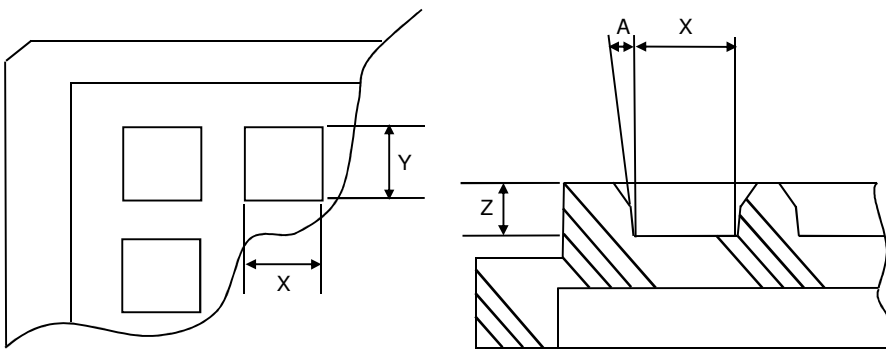
Mechanical Data

Parameter			Units
Chip Dimensions Un-sawn	7188 x 6731		µm
Chip Thickness (Nominal)	75		µm
Gate Pad Size	559 x 406		µm
Wafer Diameter	150 (subject to change)		mm
Saw Street	80 (subject to change)		µm
Wafer orientation on frame	Wafer notch parallel with frame flat		
Topside Metallisation & Thickness	Al	4	µm
Backside Metallisation & Thickness	V/Ni/Ag	0.45	µm
Topside Passivation	Silicon Nitride		
Recommended Die Attach Material	Soft Solder or Conductive Epoxy		
Recommended Wire Bond - Gate	Al 150µm X1		
Recommended Wire Bond – Source	Al 500µm X2		

Sawn Wafer on Film-Frame – Dimensions (inches)



Die in Waffle Pack – Dimensions (mm)



X = 7.52mm ±0.13mm pocket size
 Y = 7.52mm ±0.13mm pocket size
 Z = 0.51mm ±0.08mm pocket depth
 A = 5° ±1/2° pocket draft angle
 No Cross Slots
 Array = 5 X 5 (25)

OVERALL TRAY SIZE

Size = 50.67mm ±0.25mm
 Height = 3.94mm ±0.13mm
 Flatness = 0.30mm

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

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