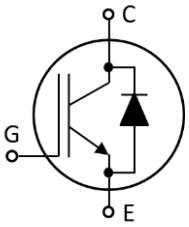
Discrete IGBT

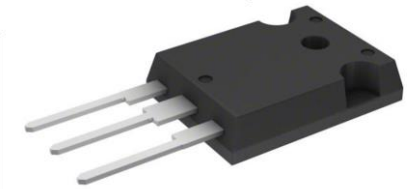
Features:

- 650V Trench & Field stop technology
- Low switching losses
- Positive temperature coefficient

Applications:

- Solar converters
- Welding converters
- UPS





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Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter voltage	V_{CE}	650	V
Continuous DC collector current	$I_{C\ nom}$	50	A
Gate emitter voltage	V_{GE}	±20	V

Static Characteristic, T_{vj}=25°C

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
Collector-Emitter saturation voltage	V_{GE}=15V, I_C=50A	V_{CEsat}		1.98		V
Gate-Emitter threshold voltage	I_C=0.5mA, V_{GE}= V_{CE}	$V_{GE(th)}$		5.07		
Gate-emitter cut-off current	V_{CE}=650V, V_{GE}= 0V	I_{CES}			10	uA
Gate-Emitter leakage current	V_{CE}=0V, V_{GE}= 30V	I_{GES}			100	nA
Transconductance	V_{CE}=20V, I_C= 50A	g_{fs}		33.2		S
Integrated gate resistor		r_G		0.78		Ω

Dynamic Characteristic, T_{vj}=25°C

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
Input capacitance	V_{CE}=25V, V_{GE}=0V, f=1MHz	C_{ies}		4756		pF
Output capacitance		C_{oes}		405		
Reverse transfer capacitance		C_{res}		49		
Gate charge	V_{CC}=520V, I_C=50A, V_{GE}=15V	Q_g		103		nC
Turn-on delay time	I_C=25A, V_{CC}=400V, V_{GE}=0/15V, R_G=12Ω, (inductive load)	$t_{d(on)}$		70		ns
Rise time		t_r		32		
Turn-off delay time		$t_{d(off)}$		184		
Fall time		t_f		54		
Turn-on energy loss per pulse		E_{on}		0.64		mJ
Turn-off energy loss per pulse		E_{off}		0.47		
Total switching energy		E_{ts}		1.11		
Turn-on delay time	I_C=6A, V_{CC}=400V, V_{GE}=0/15V, R_G=12Ω, (inductive load)	$t_{d(on)}$		62		ns
Rise time		t_r		4		
Turn-off delay time		$t_{d(off)}$		178		
Fall time		t_f		196		
Turn-on energy loss per pulse		E_{on}		0.15		mJ
Turn-off energy loss per pulse		E_{off}		0.18		
Total switching energy		E_{ts}		0.33		

Diode Characteristic, T_{vj}=25°C

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
Diode forward voltage	V_{GE}=0V, I_F=27A	V_F		1.37		V
Reverse recovery time	I_F=25A, V_R=400V,	T_{rr}		66		ns

Peak reverse recovery current	di_F/dt=1200A/μs	Q_{rr}		0.36		μC
Recovered charge		I_{rrm}		10.8		A
Reverse recovered energy		E_{rec}		0.06		mJ
Reverse recovery time	I_F=6A, V_R=400V, di_F/dt=1200A/μs	T_{rr}		57		ns
Peak reverse recovery current		Q_{rr}		0.24		μC
Recovered charge		I_{rrm}		12.8		A
Reverse recovered energy		E_{rec}		0.05		mJ

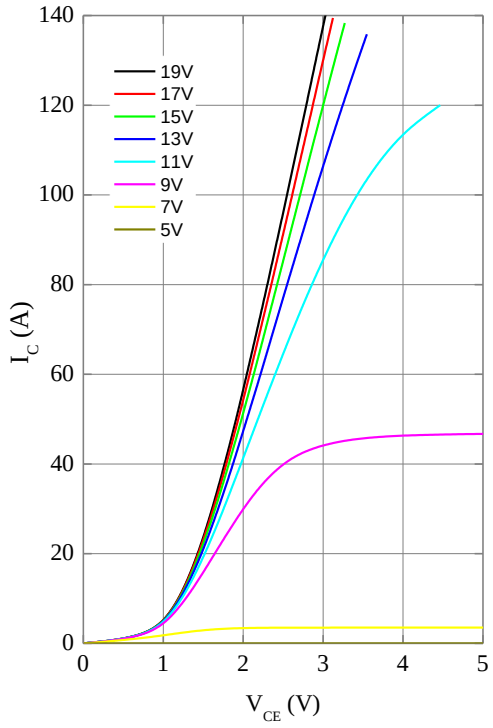


Figure 1. Typical output characteristic (T_{vj}=25°C)

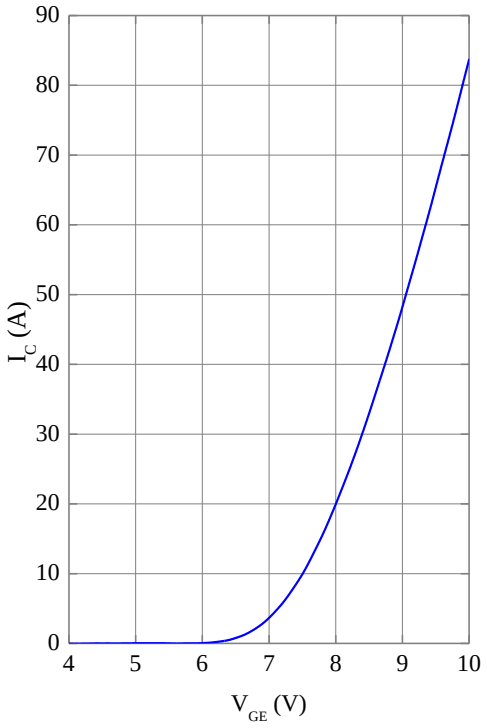


Figure 2. Typical transfer characteristic (V_{CE}=20V, T_{vj}=25°C)

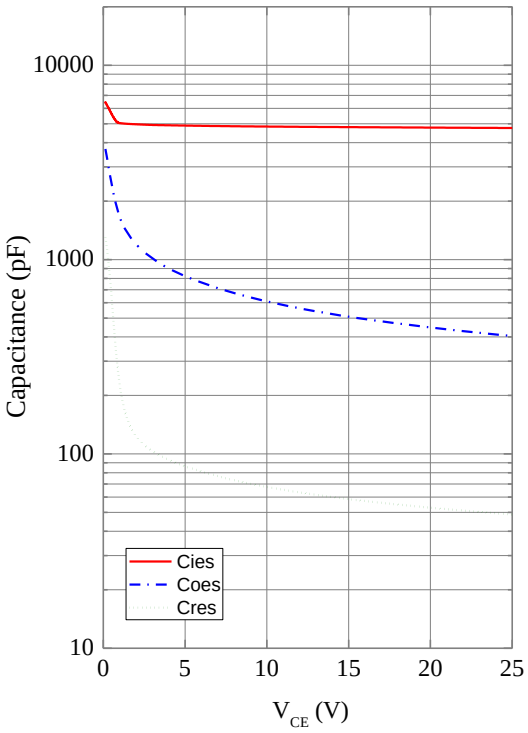


Figure 3. Capacitance as a function of collector-emitter voltage (V_{GE}=0V, f=1MHz)

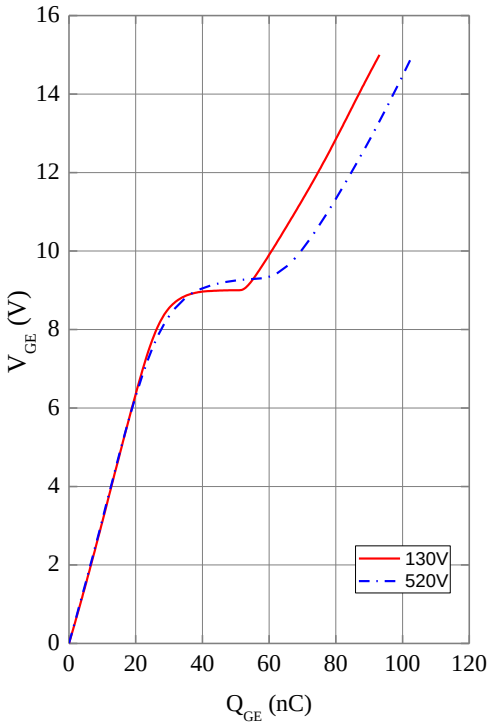
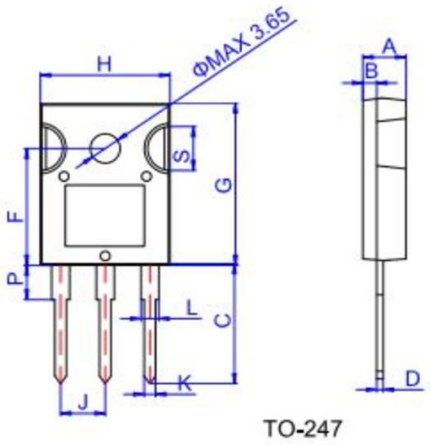


Figure 4. Gate charge (I_C=50A)

Package outlines



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Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.9		5.4	0.193		0.213
B	1.6		2.0	0.063		0.079
C	14.35		15.4	0.565		0.606
D	0.5		0.8	0.020		0.031
F	14.4		15.1	0.567		0.594
G	19.7		20.6	0.775		0.811
H	15.4		16.2	0.606		0.638
J	5.3		5.6	0.209		0.220
K	1.3		1.5	0.051		0.059
L	2.8		3.3	0.110		0.130
P	3.7		4.2	0.146		0.165
S	5.35		5.65	0.211		0.222

Revision history

Edition	Modification Record	Data from	Author	Date
1.0	initial	06102-D1	XL	18.12.2018