

General Description

This IGBT is produced using advanced Cmos's Field Stop Trench IGBT Technology, which provides high switching series and excellent quality. This device is for PFC, UPS & Inverter applications.

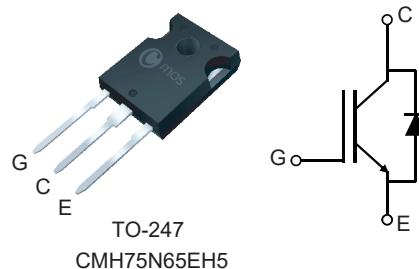
Product Summary

VCES	IC
650V	75A

Applications

- PFC
- UPS
- Inverter

TO-247 Pin Configuration



Features

- Easy parallel switching capability due to positive temperature coefficient in VCEsat
- Low VCEsat, fast switching

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{CES}	Collector-Emitter Voltage	650	V
V _{GES}	Gate-Emitter Voltage	±20	V
I _C @T _C =25°C	Collector Current	90	A
I _C @T _C =100°C		75	A
I _{CM}	Pulsed Collector Current *	300	A
I _F @T _C =100°C	Diode Continuous Forward Current	37	A
I _{FM}	Diode Maximum Forward Current	148	A
P _D @T _C =25°C	Maximum Power Dissipation	395	W
P _D @T _C =100°C	Maximum Junction Temperature	197	W
T _{VJ}	Operating Junction temperature range	-55 to 175	°C
T _{stg}	Storage temperature range	-55 to 150	°C

* Repetitive rating : Pulse width limited by max. junction temperature

Thermal Data

Symbol	Parameter	Typ.	Max.	Units
R _{thJA}	Thermal Resistance, Junction-Ambient	---	40	°C/W
R _{thJC}	Thermal Resistance, IGBT Junction-Case	---	0.38	°C/W
R _{thDC}	Thermal Resistance, Diode Junction-Case	---	0.45	°C/W

Electrical Characteristics (T_j=25°C , unless otherwise noted)

Symbol	Characteristic	Test Condition	Min.	Typ.	Max.	Unit
Static						
BV _{CES}	Collector-Emitter Breakdown Voltage	V _{CE} =0V , I _c =1mA	650	---	---	V
I _{CES}	Collector Cut-off Current	V _{GE} =0V , V _{CE} =650V , T _{vj} = 25°C	---	---	0.01	mA
I _{GES}	Gate Leakage Current	V _{CE} =0V , V _{GE} =±20V	---	---	±250	nA
V _{GE(th)}	Gate-Emitter Threshold Voltage	V _{CE} = V _{GE} , I _c =1.2mA	4.3	5.3	6.3	V
V _{CE(sat)}	Collector-Emitter Saturation Voltage	V _{GE} =15V, I _c =75A, T _{vj} = 25°C	---	1.47	1.82	V
		V _{GE} =15V, I _c =75A, T _{vj} = 150°C	---	1.69	---	V
Dynamic						
Q _g	Total Gate Charge	V _{CC} =100V, V _{GE} =15V, I _c = 75A	---	180	---	nC
Q _{ge}	Gate-Emitter Charge		---	36	---	
Q _{gc}	Gate-Collector Charge		---	48	---	
t _{d(on)}	Turn-On Delay Time	V _{CC} =400V, I _c =75A, V _{GE} =0/15V, R _G =10Ω Inductive Load , T _{vj} = 25°C	---	70.4	---	ns
t _r	Rise Time		---	64	---	
t _{d(off)}	Turn-Off Delay Time		---	211.2	---	
t _f	Fall Time		---	67.2	---	
E _{on}	Turn-On Switching Loss		---	2.04	---	mJ
E _{off}	Turn-Off Switching Loss		---	1.33	---	
E _{ts}	Total Switching Loss		---	3.37	---	
t _{d(on)}	Turn-On Delay Time	V _{CC} =400V, I _c =75A, V _{GE} =0/15V, R _G =10Ω Inductive Load , T _{vj} = 150 °C	---	67.2	---	ns
t _r	Rise Time		---	73.6	---	ns
t _{d(off)}	Turn-Off Delay Time		---	243.2	---	ns
t _f	Fall Time		---	69	---	ns
E _{on}	Turn-On Switching Loss		---	3.66	---	mJ
E _{off}	Turn-Off Switching Loss		---	1.64	---	mJ
E _{ts}	Total Switching Loss		---	5.3	---	mJ
C _{ies}	Input Capacitance	V _{CE} =25V , V _{GE} =0V , f=1MHz	---	5000	---	pF
C _{oes}	Output Capacitance		---	200	---	
C _{res}	Reverse Transfer Capacitance		---	45	---	

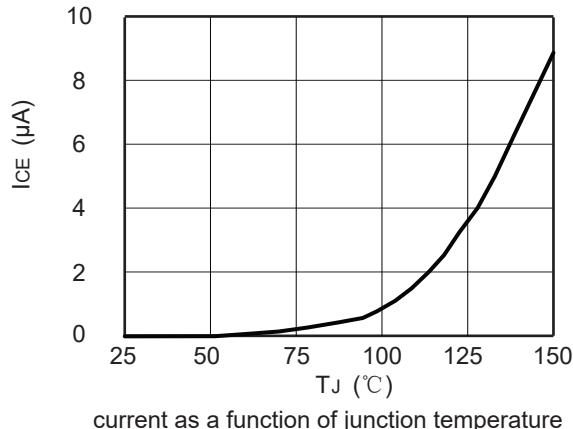
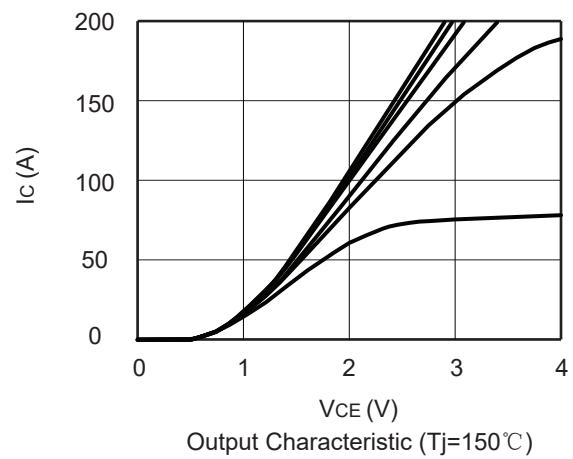
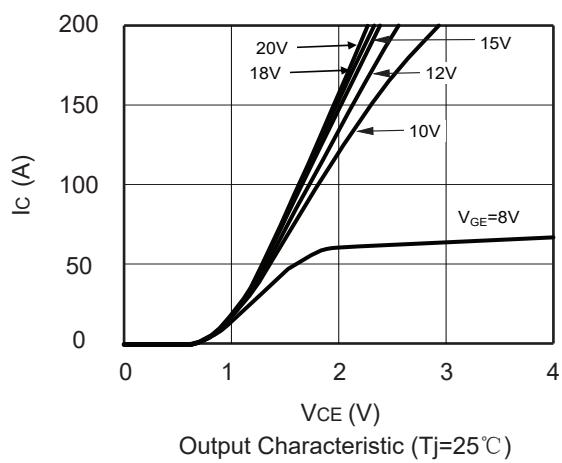
Electrical Characteristic Of Diode

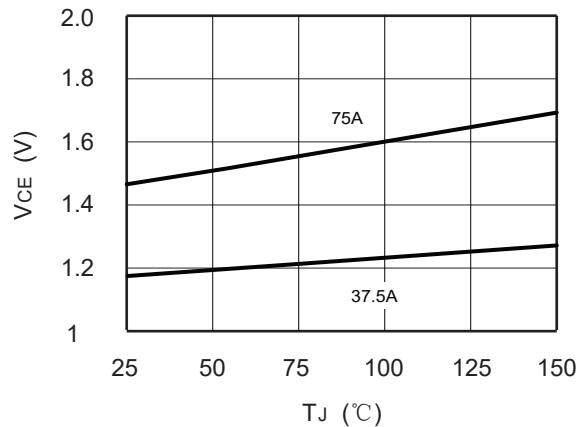
Symbol	Characteristic	Test Condition	Mim.	Typ.	Max.	Unit
V_F	Diode Forward Voltage	$I_F = 30A$	$T_c=25^\circ C$	---	1.39	1.8
			$T_c=150^\circ C$	---	1.20	---
t_{rr}	Diode Reverse Recovery Time	$V_R=200V$ $I_F=30A$ $di/dt = 200A/\mu s$	$T_c=25^\circ C$	---	40	---
			$T_c=125^\circ C$	---	142	---
	Diode Peak Reverse Recovery Current		$T_c=25^\circ C$	---	11	---
Q_{rr}	Diode Reverse Recovery Charge		$T_c=125^\circ C$	---	18	---
			$T_c=25^\circ C$	---	0.47	---
			$T_c=125^\circ C$	---	1.25	---

This product has been designed and qualified for the consumer market.

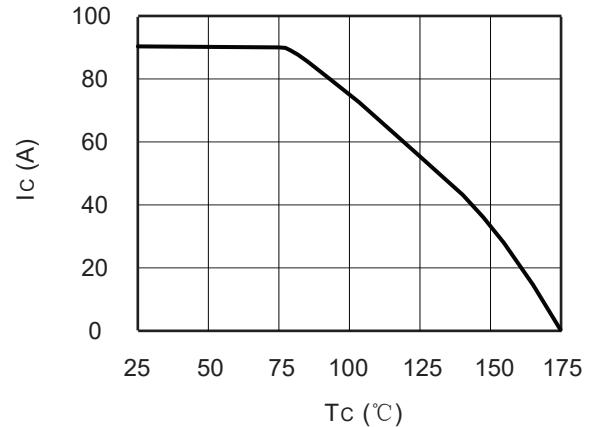
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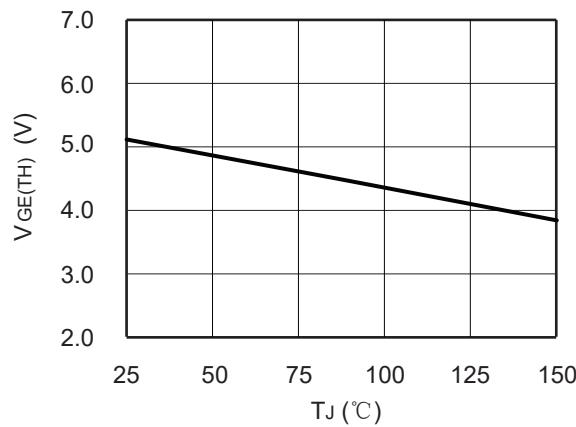
Typical electrical and thermal characteristics


Typical electrical and thermal characteristics


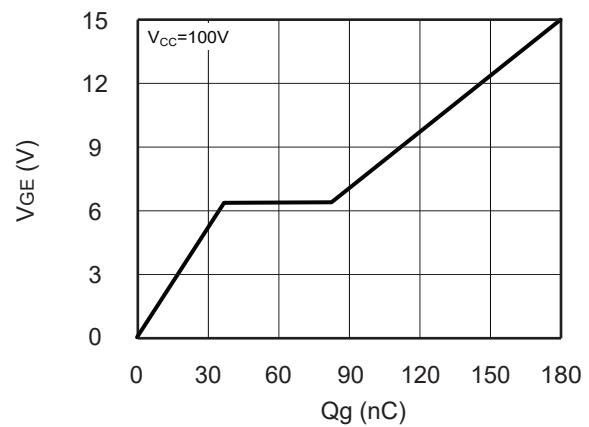
Collector-Emitter Saturation Voltage vs.
Junction Temperature



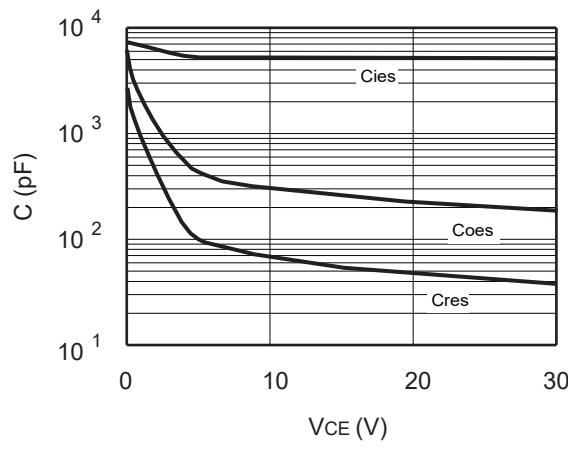
Collector current as a function of case temperature



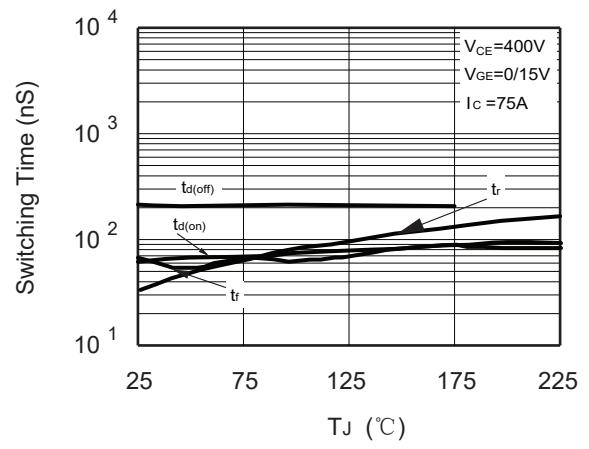
Gate threshold voltage vs Junction Temperature



Gate-Charge Characteristics



Capacitance Characteristic

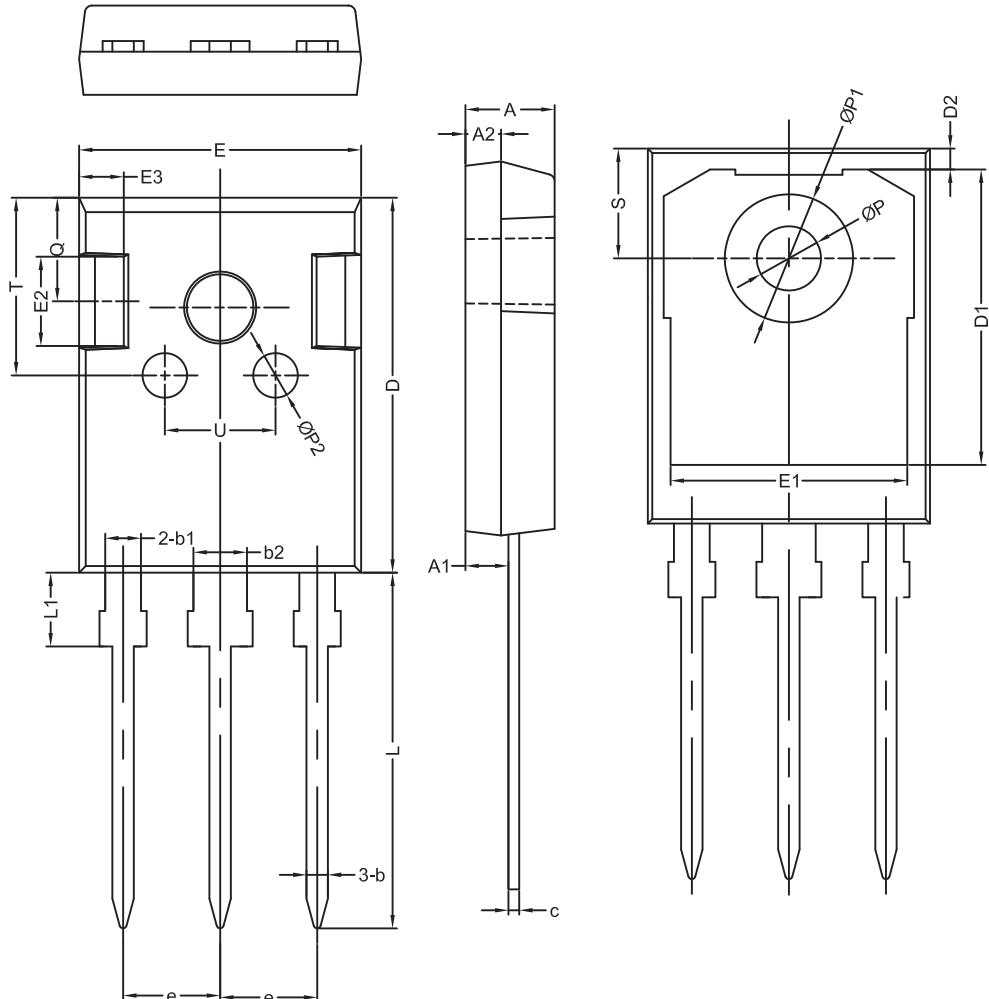


switching times as a function of junction temperature

Package Dimension

TO-247

Unit :mm



符号	机械尺寸/mm			符号	机械尺寸/mm		
	最小值	典型值	最大值		最小值	典型值	最大值
A	4.80	5.00	5.20	E2		5.00	
A1	2.21	2.41	2.61	E3		2.50	
A2	1.90	2.00	2.10	e		5.44	
b	1.10	1.20	1.35	L	19.42	19.92	20.42
b1		2.00		L1		4.13	
b2		3.00		P	3.50	3.60	3.70
c	0.55	0.60	0.75	P1		7.19	
D	20.80	21.00	21.20	P2		2.50	
D1		16.55		Q		5.80	
D2		1.20		S	6.05	6.15	6.25
E	15.60	15.80	16.0	T		10.00	
E1		13.30		U		6.20	