

CMH75N65EH5

650V,75A Field Stop Trench IGBT

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

V _{CES}	I _C
650V	75A

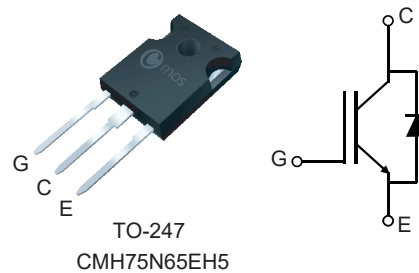
Applications

- PFC
- UPS
- Inverter

Features

- Easy parallel switching capability due to positive temperature coefficient in V_{CESat}
- Low V_{CESat}, fast switching

TO-247 Pin Configuration



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 _{thJC}	Thermal Resistance, Diode Junction-Case	---	0.45	°C/W

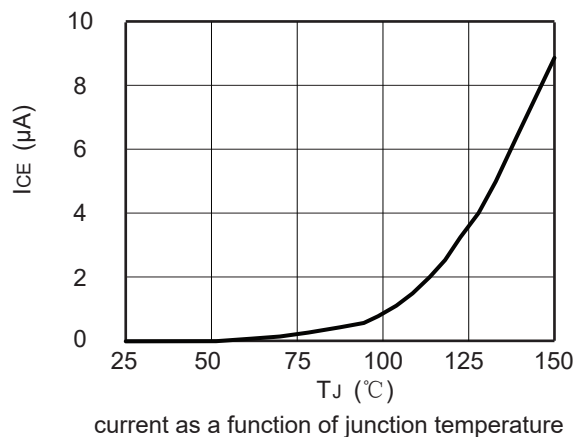
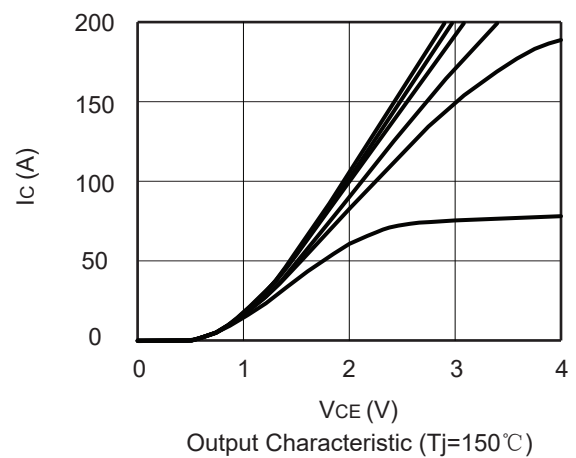
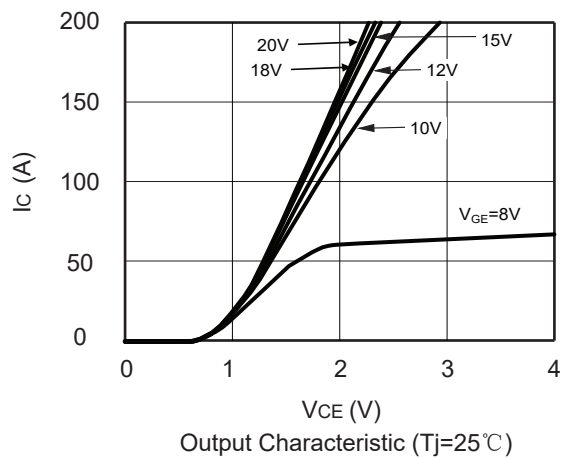
Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

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℃	---		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℃	---	1.47	1.82	V
		V _{GE} =15V, I _C =75A, T _{Vj} = 150℃	---	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 _j = 25℃	---	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℃	---	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	---	

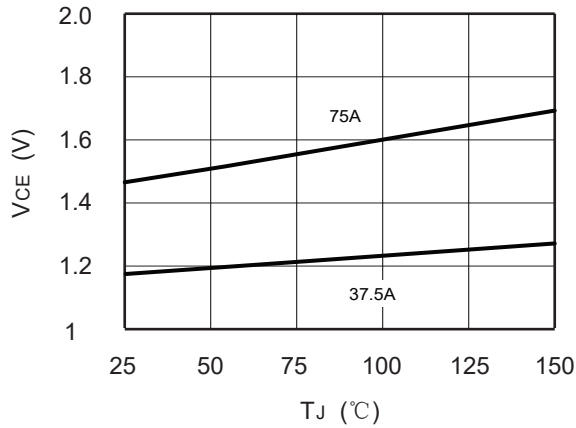
Electrical Characteristic Of Diode

Symbol	Characteristic	Test Condition		Mim.	Typ.	Max.	Unit
V _F	Diode Forward Voltage	I _F = 30A	T _C =25℃	---	1.39	1.8	V
			T _C =150℃	---	1.20	---	
t _{rr}	Diode Reverse Recovery Time	V _R =200V I _F =30A di/dt =200A/μs	T _C =25℃	---	40	---	ns
			T _C =125℃	---	142	---	
I _{rr}	Diode Peak Reverse Recovery Current		T _C =25℃	---	11	---	A
			T _C =125℃	---	18	---	
Q _{rr}	Diode Reverse Recovery Charge		T _C =25℃	---	0.47	---	μC
			T _C =125℃	---	1.25	---	

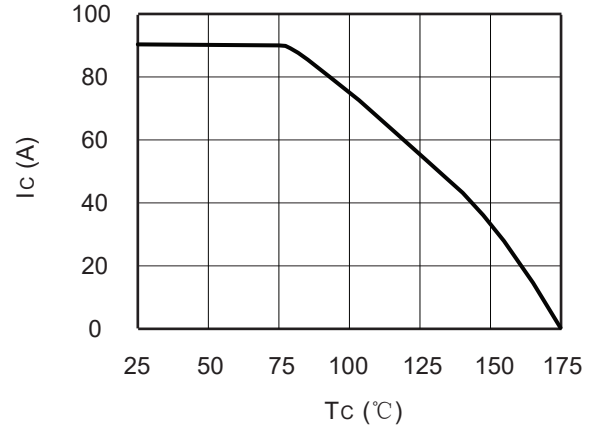
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Typical electrical and thermal characteris


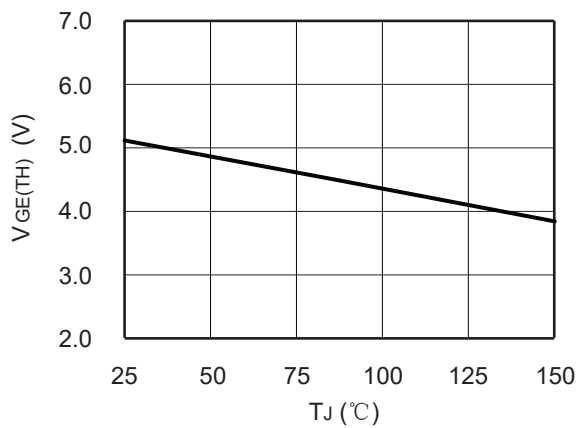
Typical electrical and thermal characteris



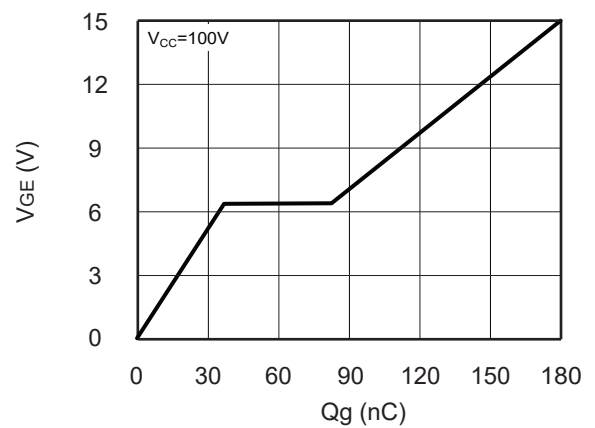
Collector-Emitter Saturation Voltage vs. Junction Temperature



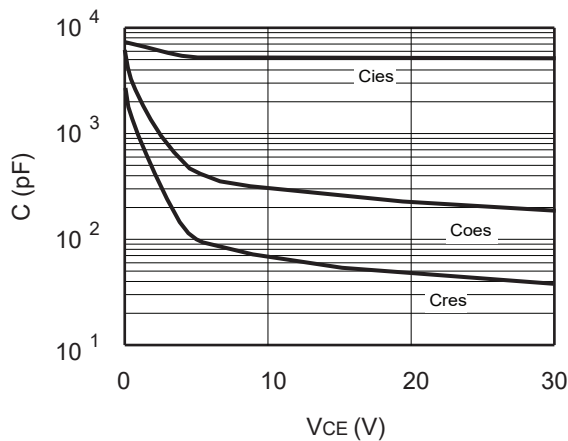
Collector current as a function of case temperature



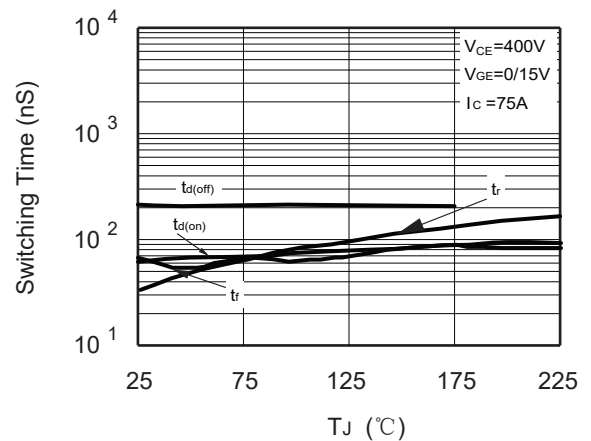
Gate threshold voltage vs Junction Temperature



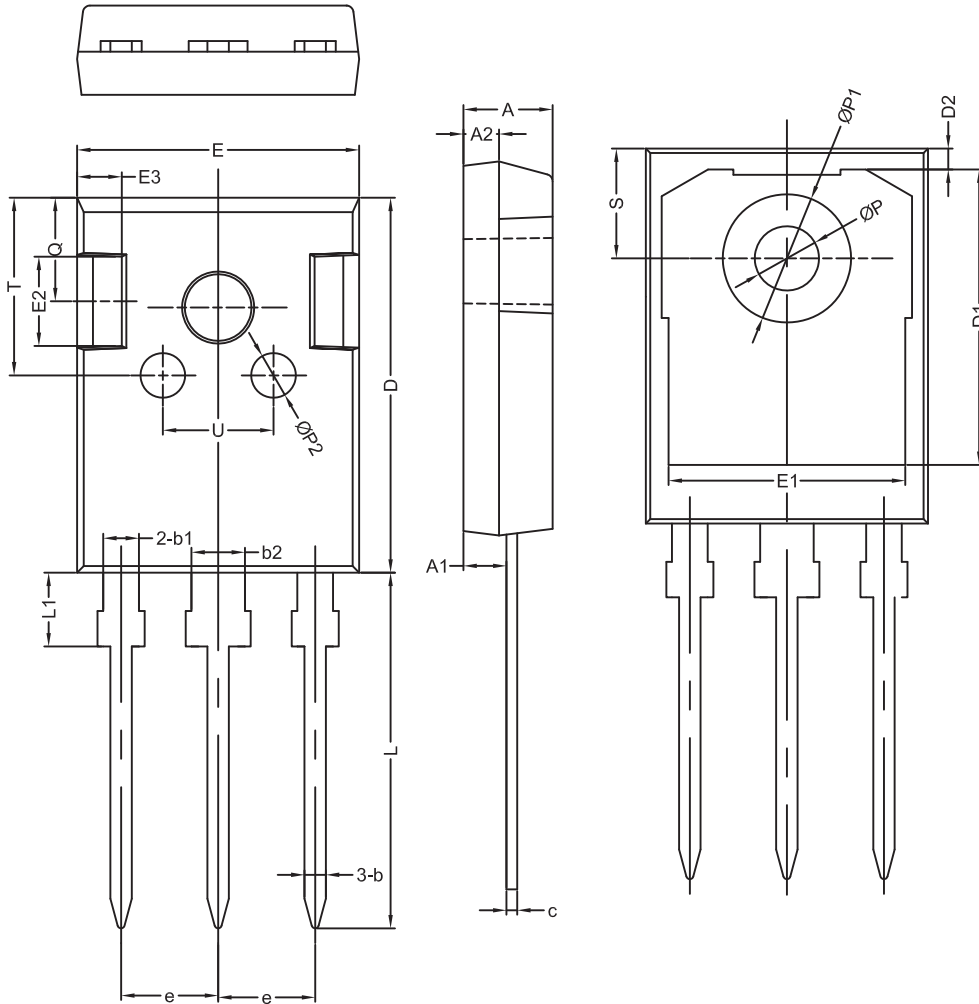
Gate-Charge Characteristics



Capacitance Characteristic



switching times as afunction 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	