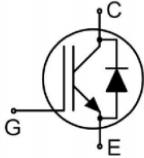


●Features

- Low Gate Charge
- Low Power Loss & High Efficiency
- Guard Ring & Environmental Protection
- High Temperature Application
- Green Molding Compound

	$V_{CES}: 650V$ $I_C: 50A$ $V_{CE(SAT)}: 1.8V$
 TO-263	■RoHS COMPLIANT

●Application

- DC-DC Inverters
- UPS
- Industrial Heating

●Ordering Information:

Part Number	LHG50T65T63H
Package	TO-263
Basic Ordering Unit (pcs)	800
Normal Package Material Ordering Code	LHG50T65T63H-TO263-TAP
Halogen Free Ordering Code	LHG50T65T63H-TO263-TAP-HF

●Absolute Maximum Ratings (Ta=25℃)

Symbol	Parameter		Rating	Unit
Common Ratings (T _A =25°C Unless Otherwise Noted)				
V _{CES}	Collector- Emitter Voltage (MIN.)		650	V
V _{GES}	Gate-Emitter Voltage		±20	
I _C	Continuous Collector Current	T _C = 25°C	100.0	A
		T _C = 100°C	50.0	
I _{CM}	Collector Current Continuous (Note 1.)		150.0	A
P _D	Maximum Power Dissipation (T _C =25°C)		410	W
T _J	Maximum Junction Temperature		-50 to 150	°C
T _{STG}	Storage Temperature Range		-50 to 150	°C
T _L	Maximum Lead Temperature for Soldering Purposes		275	°C

Notes : ¹⁾ Collector current limited by maximum junction temperature.

● Thermal Resistance

Symbol	Parameter	Values		Unit
		Typ.	Max.	
R _{thJC}	Thermal Resistance, Junction - Case	-	0.30	℃/W
R _{thJA}	Thermal Resistance, Junction - Ambient	-	56	℃/W

● Electrical Characteristics (T_J=25℃ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	Values			Unit
			Min.	Typ.	Max.	
Off Characteristics						
BV _{CES}	Collector-Emitter Breakdown Voltage	V _{GS} =0V, I _C =250uA	650	-	-	V
I _{CES}	Zero Gate Voltage Drain Current	V _{CE} = 600V, V _{GE} = 0V, T _C =25°C	-	-	1.0	mA
I _{GESF}	Gate-body Leakage Current (Forward)	V _{CE} =0V,V _{GE} =20V	-	-	250	nA
I _{GESR}	Gate-body Leakage Current (Reverse)	V _{CE} =0V,V _{GE} =-20V	-	-	-250	nA
ΔBV _{CES} /ΔT _J	Breakdown Voltage Temperature Coefficient.	I _C =1mA, Reference to 25°C	-	0.6	-	V/°C

• Electrical Characteristics ($T_J=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	Values			Unit
			Min.	Typ.	Max.	
On Characteristics						
$V_{GE(th)}$	Gate Threshold Voltage	$V_{CE} = V_{GE}$, $I_C=1mA$	4.0	5.36	7.0	V
$V_{CE(SAT)}$	Collector- Emitter Saturation Voltage	$V_{GE}=15V$, $I_C=50A$ $T_C = 25^{\circ}C$	-	1.8	2.4	V

• Electrical Characteristics ($T_J=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	Values			Unit
			Min.	Typ.	Max.	
Switching Characteristics						
C _{ies}	Input Capacitance	V _{CE} =30V, V _{GE} =0V, Frequency=1.0MHz	-	6800	-	pF
C _{oes}	Output Capacitance		-	180	-	
C _{res}	Reverse Transfer Capacitance		-	93	-	
t _{d(ON)}	Turn-on Delay Time	V _{CE} = 400V, I _C = 50A, R _G = 10Ω V _{GE} = 15V T _C =25°C	-	90	-	nS
t _r	Turn-on Rise Time		-	90	-	
t _{d(OFF)}	Turn-off Delay Time		-	330	-	
t _f	Turn-off Fall Time		-	68	-	
E _{on}	Turn-on Energy		-	3.48	-	mJ
E _{off}	Turn-off Energy	-	1.43	-		
E _{total}	Total Switching Energy	-	4.91	-		
Q _g	Total Gate Charge	V _{CE} =400V, V _{GE} =15V, I _C =50A	-	310	-	nC
Q _{ge}	Gate to Emitter Charge		-	80	-	
Q _{gc}	Gate to Collector Charge		-	130	-	
Anti-Parallel Diode Characteristics and Maximum Ratings						
V _F	Emitter-Collector Diode Forward Voltage	VGS=0V, Is=15.0A	-	1.60	1.8	V
t _{rr}	Reverse Recovery Time	I _S =25A, V _{GE} =0V, VR=400V dl _F /dt=100A/μs (Note 4)	-	80	-	nS
Q _{rr}	Reverse Recovery Charge		-	240	-	nC
I _{RRM}	Diode Reverse Recovery Current		-	6	-	A

Note 1 : Pulse width limited by maximum junction temperature.

Note 2 : Allowed number of short circuits: < 1000 Time between short circuit: >1s.

Note 3 : Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

Note 4 : Essentially independent of operating temperature.

● Electrical Characteristic Curves

Fig. 1 Typical Output Characteristics

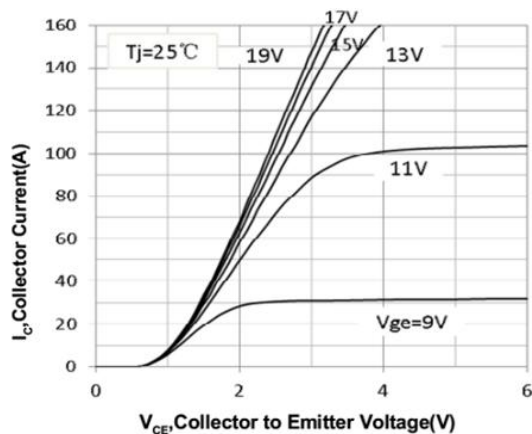


Fig. 2 Typical Output Characteristic

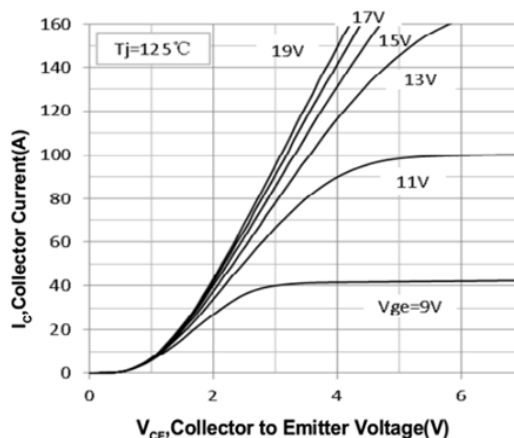


Fig. 3 $V_{CE(SAT)}$ vs. I_C Characteristics

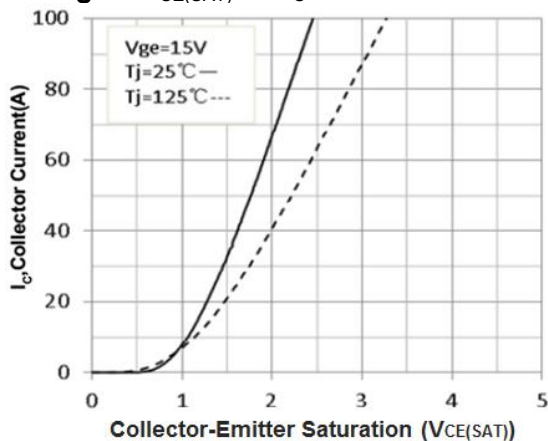


Fig. 4 $V_{CE(SAT)}$ vs. T_C

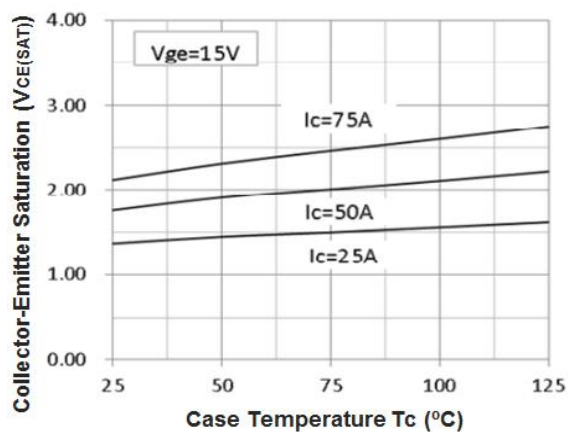


Fig. 5 Capacitance Characteristics

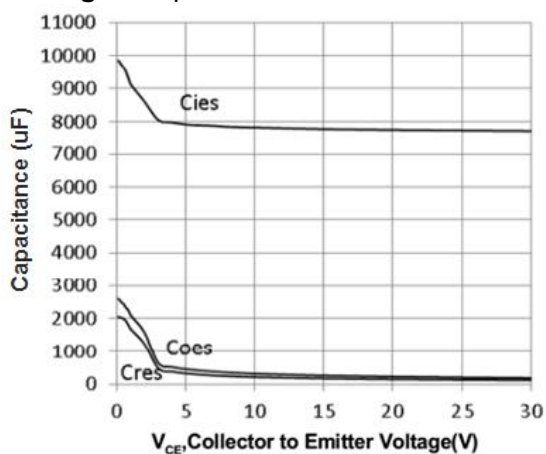
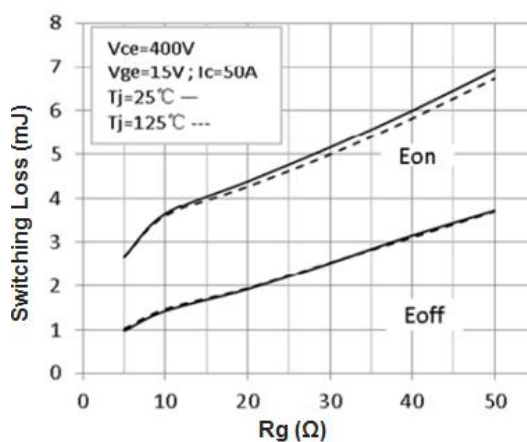


Fig. 6 Switching Energy Loss Characteristics



● **Electrical Characteristic Curves**

Fig. 7 R_g vs. Switching Time

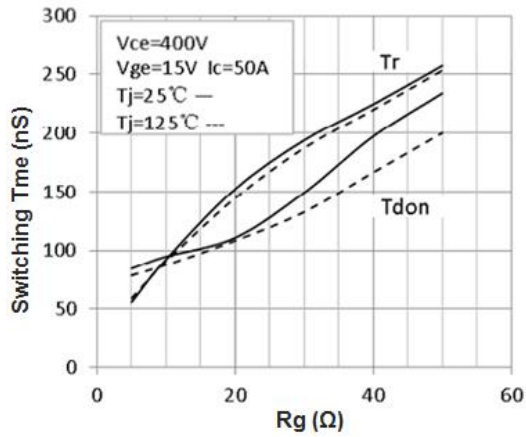


Fig. 8 R_g vs. Switching Time

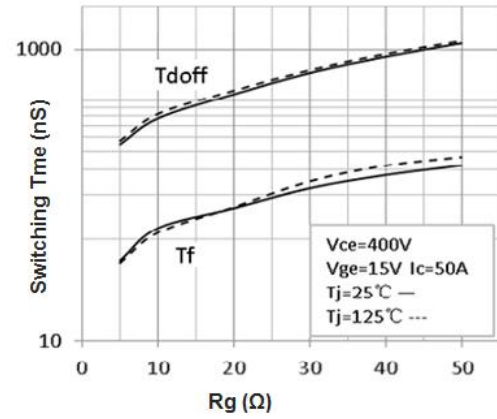


Fig. 9 T_c vs. Switching Time

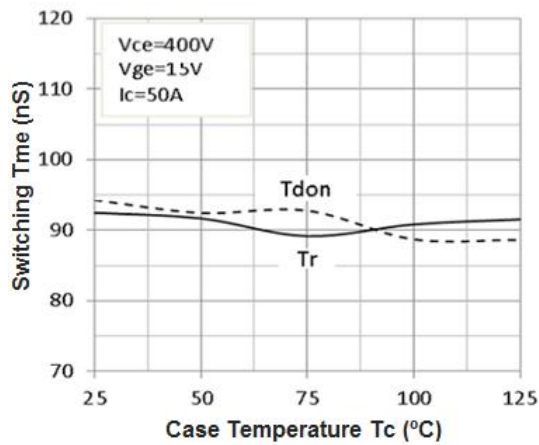


Fig. 10 T_c vs. Switching Time

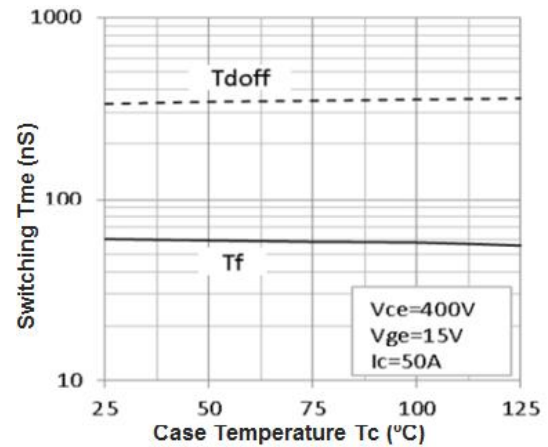


Fig. 11 T_c vs. Switching Loss

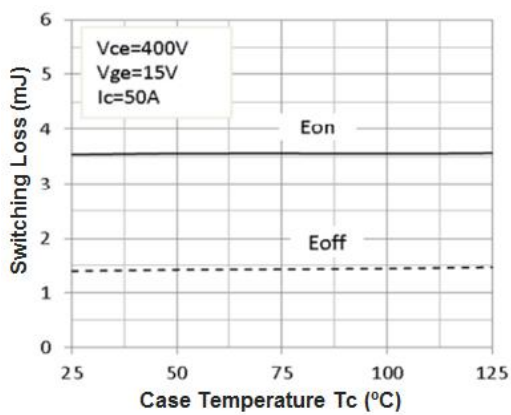
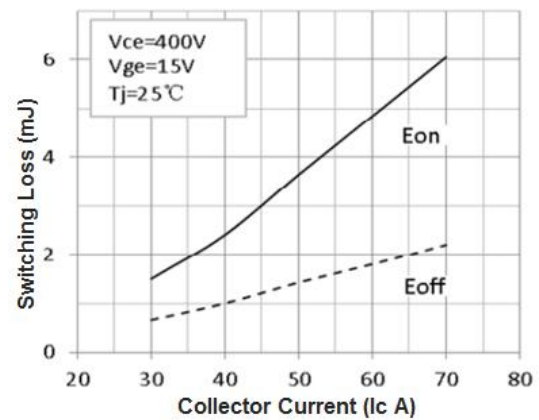


Fig. 12 I_c vs. Switching Loss



● **Electrical Characteristic Curves**

Fig. 13 I_C vs. Switching Time

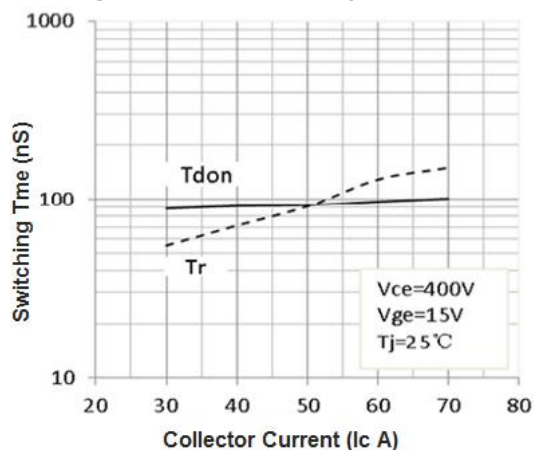


Fig. 14 I_C vs. Switching Time

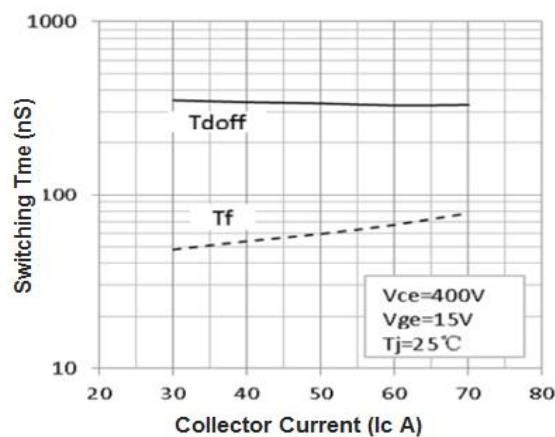


Fig. 14 Reverse Diode Characteristics

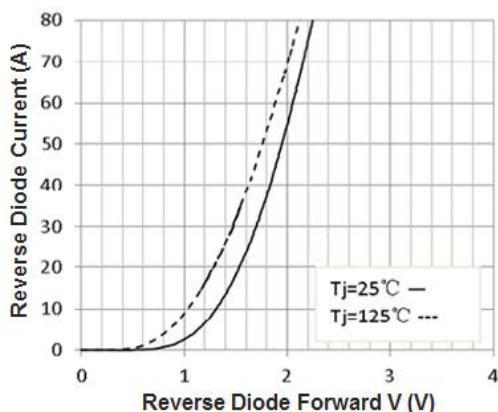


Fig. 15 T_C vs. I_C Current (A)

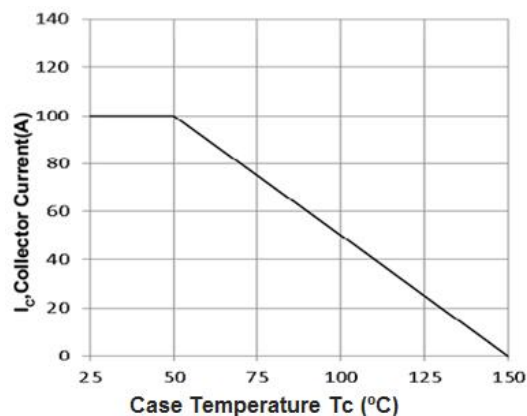


Fig. 17 Safety Area

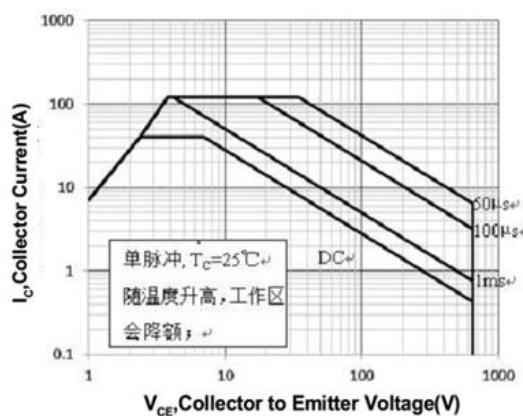
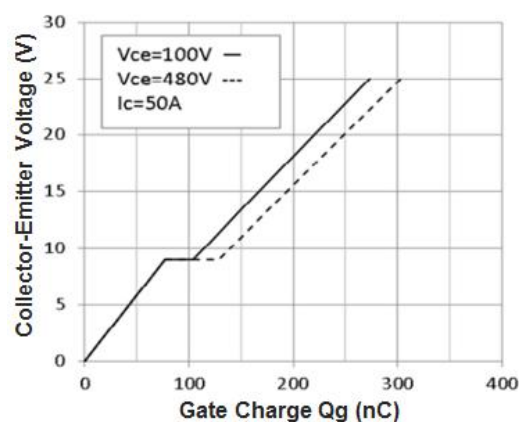
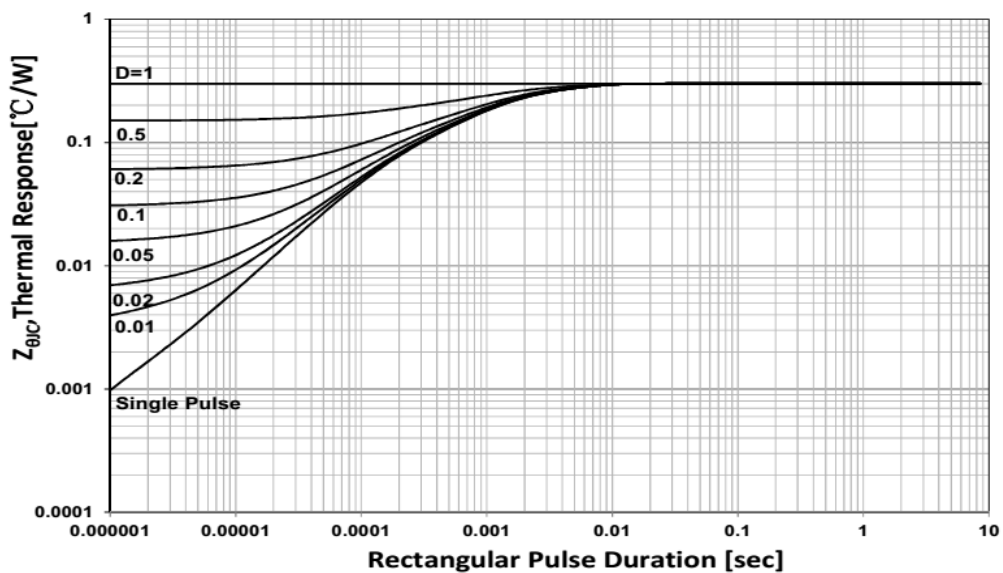


Fig. 18 Gate Charge Characteristics



- Electrical Characteristic Curves

Fig. 19 Transient Thermal Impedance for IGBT



●Dimensions (TO-263)

Unit: mm

SYMBOL	min	max	SYMBOL	min	max
A	4.25	4.85	B1	1.20	1.80
A1	2.30	3.00	e	2.40	2.70
A2	1.20	1.40	L	4.80	5.60
b	0.60	0.90			
b1	1.10	1.70			
c	0.40	0.70			
D	9.80	10.60			
B	10.40	11.40			

