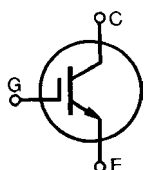


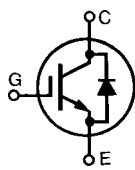
SG40T65UDB2

Discrete IGBTs

$V_{CES} = 650V$
 $I_{C100} = 40A$
 $V_{CESat(typ)} = 1.65V$
 $E_{off(typ)} = 0.65mJ$

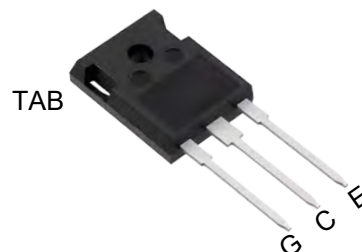


SG40T65UB2
Without FWD(Free
Wheeling Diode)



SG40T65UDB2
With FWD(Free
Wheeling Diode)

TO-247AD



G=Gate, C=Collector, E=Emitter, TAB=Collector

IGBT

Symbol	Test Conditions	Maximum Ratings	Unit
V_{CES} V_{CGR}	$T_J=25^{\circ}C$ to $150^{\circ}C$ $T_J=25^{\circ}C$ to $150^{\circ}C$; $R_{GE}=1\ M\Omega$;	650 650	V
V_{GES} V_{GEM}	Continuous Transient	± 20 ± 30	V
I_{C25} I_{C100} I_{CM}	$T_C=25^{\circ}C$ $T_C=100^{\circ}C$ $T_C=25^{\circ}C$, 1 ms	80 40 120	A
SSOA (RBSOA)	$V_{GE}=15V$; $T_{VJ}=125^{\circ}C$; $R_G=22\Omega$ Clamped inductive load; $L=100\mu H$	$I_{CM}=80$ @ 0.8 V_{CES}	A
P_c	$T_C=25^{\circ}C$	250	W
T_J T_{JM} T_{stg}		-55...+150 150 -55...+150	$^{\circ}C$
	Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10s	300	$^{\circ}C$
M_d	Mounting torque	1.13/10	Nm/lb.in.
Weight	Typical	6	g

($T_J=25^{\circ}C$, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
BV_{CES}	$I_C=250\mu A$; $V_{GE}=0V$	650			V
$V_{GE(th)}$	$I_C=250\mu A$; $V_{CE}=V_{GE}$	4.5	5.5	7.0	V
I_{CES}	$V_{CE}=0.8V_{CES}$; $T_J=25^{\circ}C$			250	μA
	$V_{GE}=0V$; $T_J=150^{\circ}C$			1	mA
I_{GES}	$V_{CE}=0V$; $V_{GE}=\pm 20V$			± 100	nA
$V_{CE(sat)}$	$I_C=40A$; $V_{GE}=15V$		1.65	2.10	V

Sirectifier®

SG40T65UDB2

Discrete IGBTs

(T_J=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
g _{ts}	I _C =40A; V _{CE} =10V Pulse test, t≤300us, duty cycle≤2%	20	30		S
C _{ies} C _{oes} C _{res}	V _{CE} =25V; V _{GE} =0V; f=1MHz		3100 220 120	4000	pF
Q _g Q _{ge} Q _{gc}	I _C =40A; V _{GE} =15V; V _{CE} =0.5V _{CES}		150 25 80		nC
t _{d(on)} t _{ri} t _{d(off)} t _{fi} E _{off}	Inductive load, T _J =25°C I _C =40A; V _{GE} =15V; L=100uH V _{CE} =0.5V _{CES} ; R _G =R _{off} =10Ω Remarks:Switching times may increase for V _{CE} (Clamp)>0.8V _{CES} higher T _J or increased R _G		50 35 200 35 0.65		ns ns ns ns mJ
t _{d(on)} t _{ri} E _{on} t _{d(off)} t _{fi} E _{off}	Inductive load, T _J =125°C I _C =40A; V _{GE} =15V; L=100uH V _{CE} =0.5V _{CES} ; R _G =R _{off} =10Ω Remarks:Switching times may increase for V _{CE} (Clamp)>0.8V _{CES} higher T _J or increased R _G		50 40 0.90 220 50 0.90		ns ns mJ ns ns mJ
R _{thJC}				0.73	K/W
R _{thCK}			0.25		K/W

Reverse Diode (FRED)

(T_J=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
V _F	I _F =40A; V _{GE} =0V; T _J =125°C Pulse test, t≤300us, duty cycle≤2%; T _J =25°C		1.75 1.70	2.5	V
I _{RM} t _{rr}	I _F =40A; V _{GE} =0V; -di _F /dt=100A/us V _R =100V; T _J =125°C I _F =40A; -di/dt=100A/us; V _R =30V; T _J =25°C		20 150 90		A ns ns
R _{thJC}				1.0	K/W

Sirectifier®

SG40T65UDB2

Discrete IGBTs

Features

- Trench Field Stop IGBT technology
- Low switching losses
- Switching frequency up to 30 kHz
- Square RBSOA, no latch up
- High short circuit capability
- Positive temperature coefficient for easy parallelling
- MOS input, voltage controlled
- Ultra fast free wheeling diodes

Application

- AC and DC motor control
- AC servo and robot drives
- power supplies
- welding inverters

Advantages

- space and weight savings
- reduced protection circuits

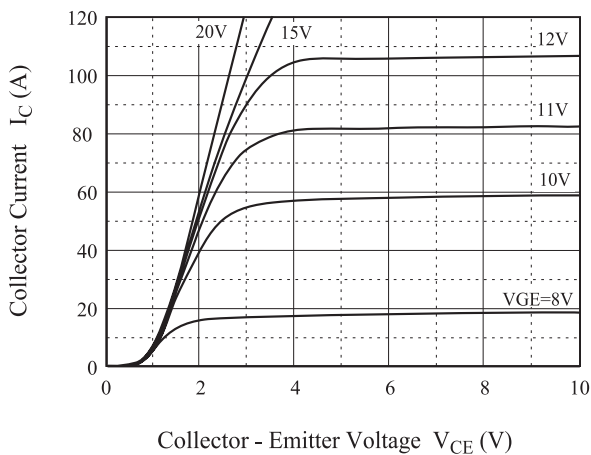


Fig 1. Saturation Voltage Characteristics

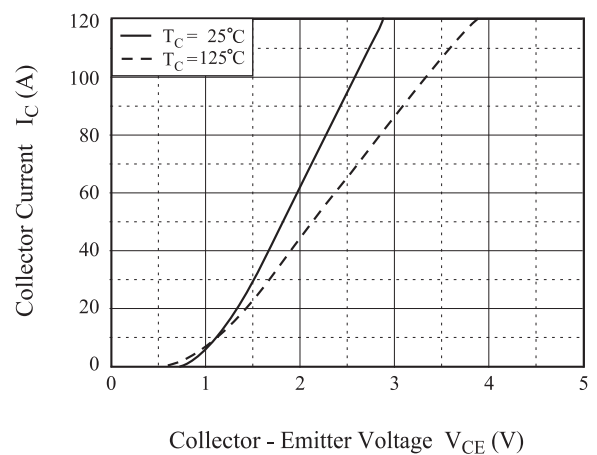


Fig 2. Saturation Voltage Characteristics

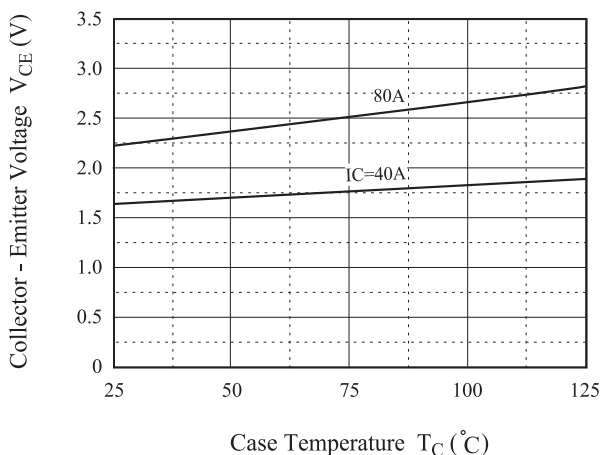


Fig 3. Saturation Voltage vs. Case Temperature

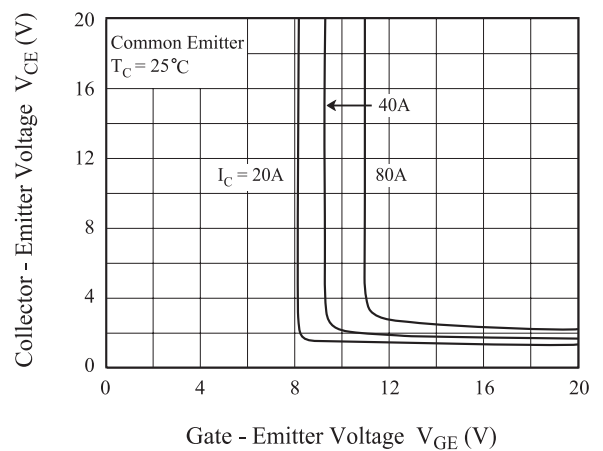


Fig 4. Saturation Voltage vs. V_{GE}

Sirectifier®

SG40T65UDB2

Discrete IGBTs

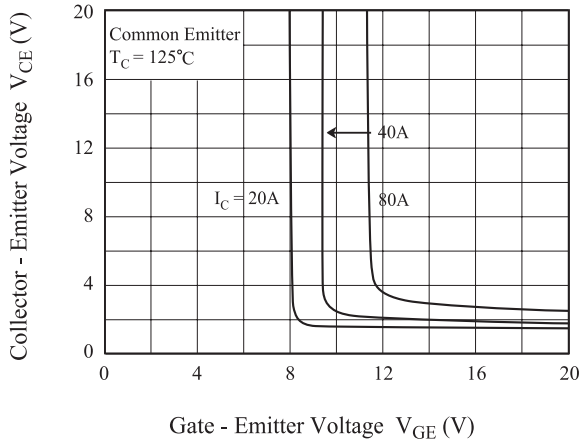


Fig 5. Saturation Voltage vs. V_{GE}

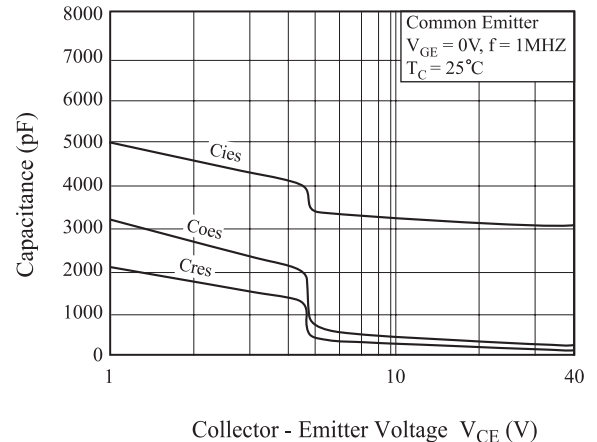


Fig 6. Capacitance Characteristics

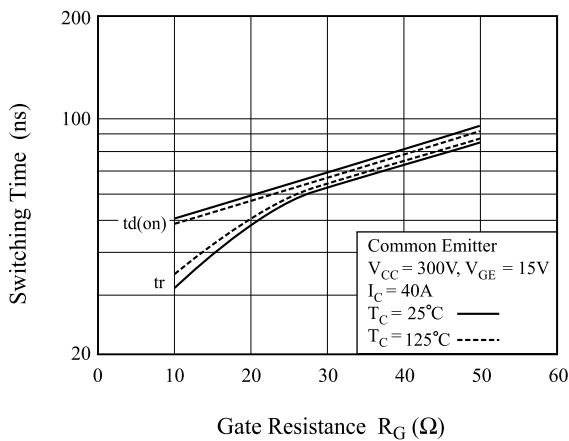


Fig 7. Turn-On Characteristics vs. Gate Resistance

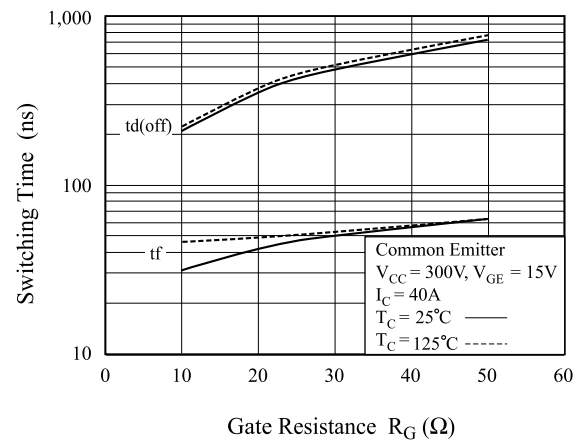


Fig 8. Turn-Off Characteristics vs. Gate Resistance

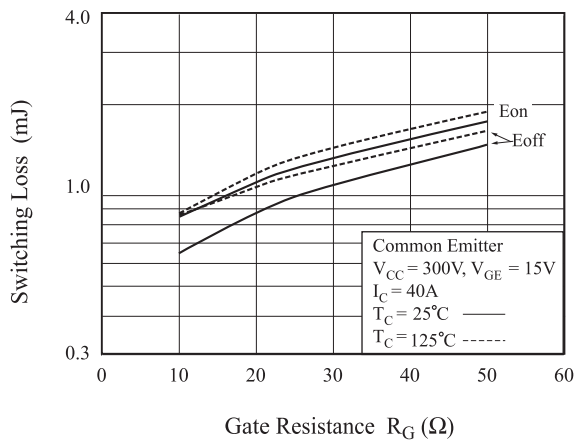


Fig 9. Switching Loss vs. Gate Resistance

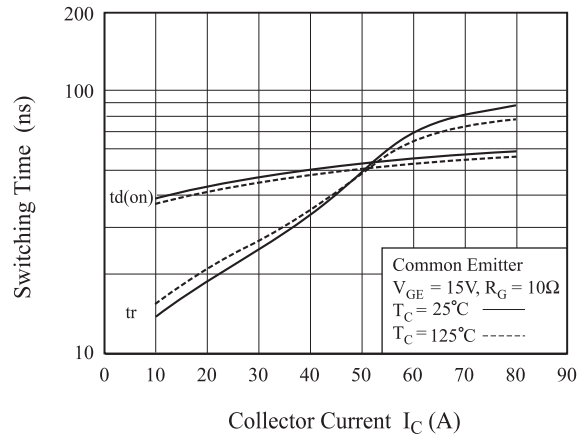


Fig 10. Turn-On Characteristics vs. Collector Current

SG40T65UDB2

Discrete IGBTs

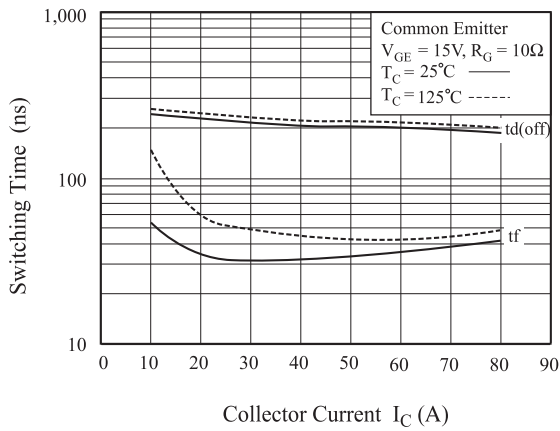


Fig 11. Turn-Off Characteristics vs. Collector Current

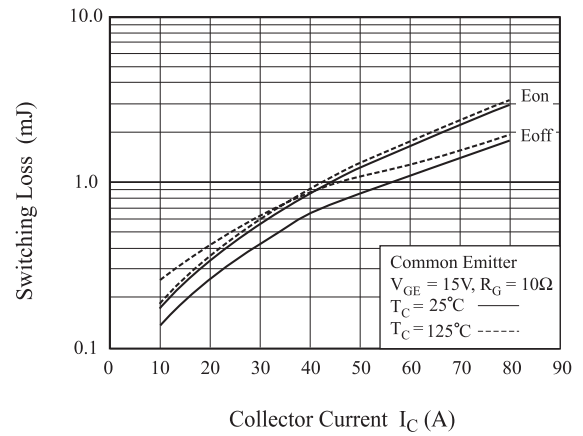


Fig 12. Switching Loss vs. Collector Current

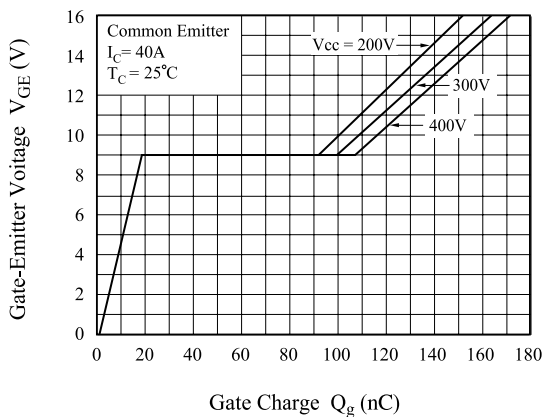


Fig 13. Gate Charge Characteristics

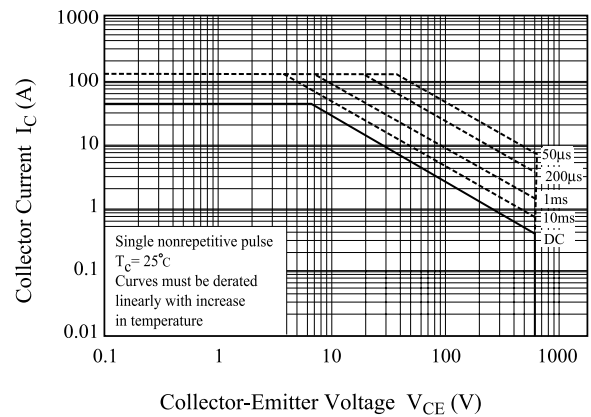


Fig 14. SOA Characteristics

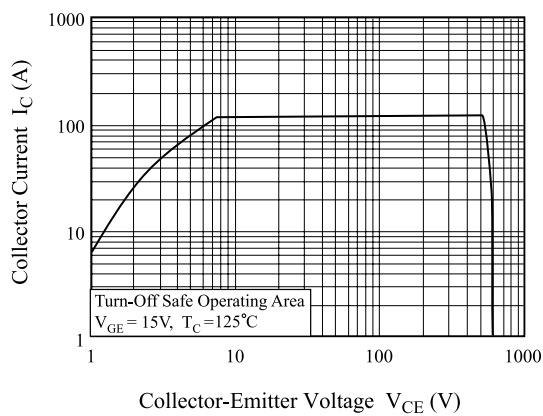


Fig 15. Turn-Off SOA

SG40T65UDB2

Discrete IGBTs

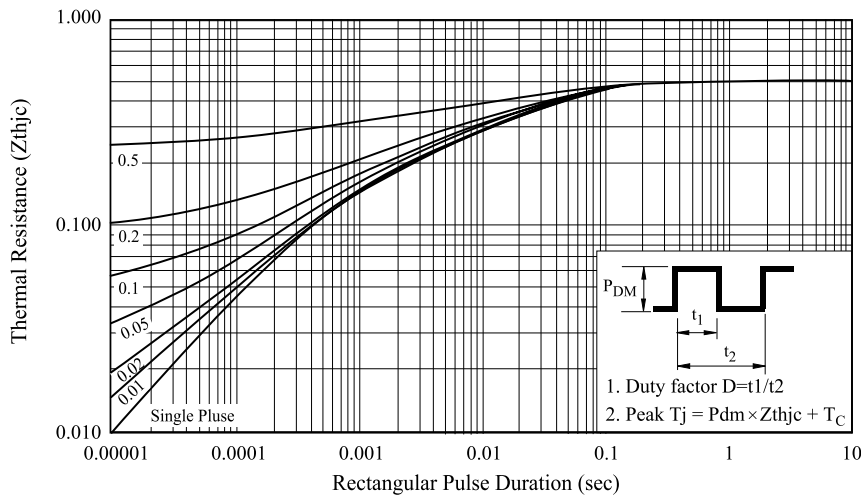


Fig 16. Transient Thermal Impedance of IGBT

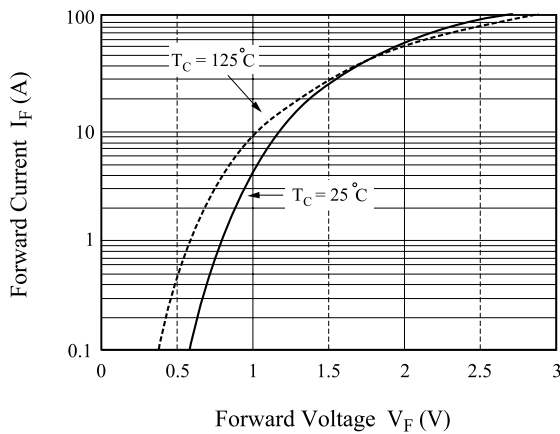


Fig 17. Forward Characteristics

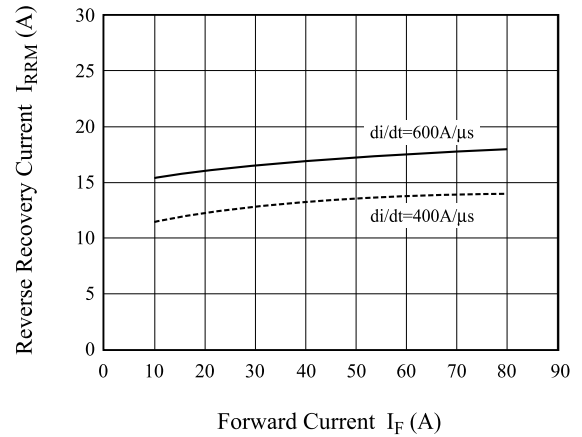


Fig 18. Reverse Recovery Current

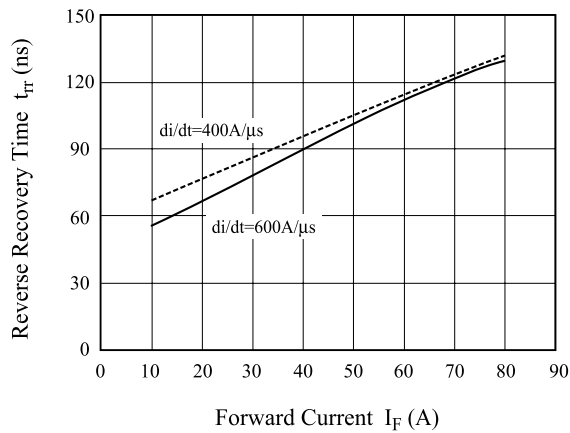
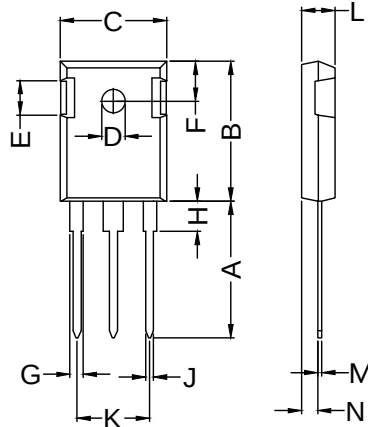
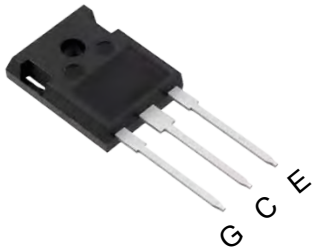


Fig 19. Reverse Recovery Time

SG40T65UDB2

Discrete IGBTs

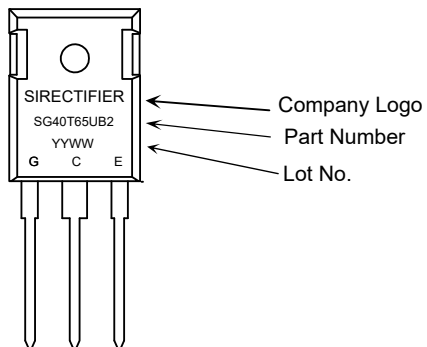
Dimensions TO-247AD



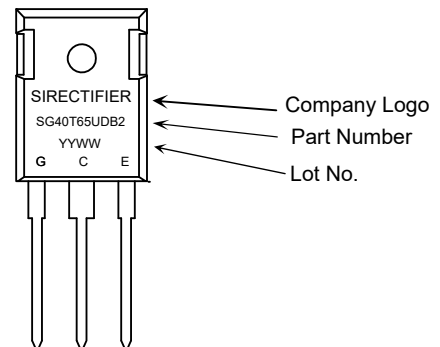
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.620	0.640
ØD	3.15	3.65	0.124	0.144
E	4.32	5.49	0.170	0.216
F	5.40	6.30	0.213	0.248
G	1.65	2.18	0.065	0.086
H	3.80	4.50	0.150	0.177
J	1.00	1.40	0.039	0.055
K	10.80	11.10	0.425	0.437
L	4.70	5.30	0.185	0.209
M	0.40	0.80	0.016	0.031
N	1.50	2.49	0.059	0.098

Marking

SG40T65UB2
(TO-247AD)



SG40T65UDB2
(TO-247AD)



Ordering Information

Part Number	Package	Shipping	Marking Code
SG40T65UB2	TO-247AD	30pcs / Tube	SG40T65UB2
SG40T65UDB2	TO-247AD	30pcs / Tube	SG40T65UDB2