

SG40T120UDB2

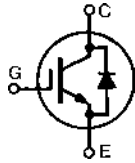
Discrete IGBTs

$$V_{CES} = 1200V$$

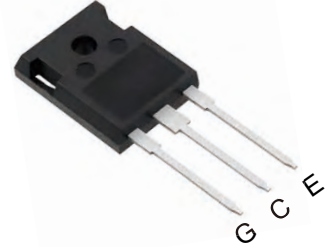
$$I_{C100} = 40A$$

$$V_{CEsat(typ)} = 1.90V$$

$$E_{off(typ)} = 1.4mJ$$



TO-247AD



SG40T120UDB2



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

IGBT

Symbol	Test Conditions	Maximum Ratings	Unit
V _{CES} V _{CGR}	T _J =25°C to 150°C T _J =25°C to 150°C; R _{GE} =1 MΩ	1200 1200	V
V _{GES} V _{GEM}	Continuous Transient	±20 ±30	V
I _{C25} I _{C100} I _{CM}	T _C =25°C; limited by leads T _C =100°C T _C =25°C, 1 ms	80 40 160	A
SSOA (RBSOA)	V _{GE} =15V; T _{VJ} =125°C; R _G =5Ω Clamped inductive load	I _{CM} =120 @ 0.8 V _{CES}	A
P _c	T _C =25°C	280	W
T _J T _{JM} T _{stg}		-55...+175 175 -55...+150	°C
	Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10s Maximum Tab temperature for soldering SMD devices for 10s	300 260	°C °C
M _d	Mounting torque (M3)	1.13/10	Nm/lb.in.
Weight	Typical	6	g

(T_J=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
BV _{CES}	I _C =1mA; V _{GE} =0V	1200			V
V _{GE(th)}	I _C =250uA; V _{CE} =V _{GE}	4.5	5.8	7.0	V
I _{CES}	V _{CE} =V _{CES} ; T _J =25°C			250	uA
	V _{GE} =0V; T _J =125°C			4	mA
I _{GES}	V _{CE} =0V; V _{GE} =±20V			±200	nA
V _{CE(sat)}	I _C =I _{C100} ; V _{GE} =15V		1.90	2.40	V

Sirectifier®

SG40T120UDB2

Discrete IGBTs

(T_J=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
g _{ts}	I _C =I _{C90} ; V _{CE} =10V Pulse test, t _s ≤300us, duty cycle≤2%		33		S
I _{C(ON)}	V _{GE} =10V; V _{CE} =10V		140		A
C _{ies} C _{oes} C _{res}	V _{CE} =25V; V _{GE} =0V; f=1MHz		6140 170 100		pF
Q _g Q _{ge} Q _{gc}	I _C =I _{C90} ; V _{GE} =15V; V _{CE} =0.5V _{CEs}		230 30 147		nC
t _{d(on)} t _{ri} t _{d(off)} t _{fi} E _{off}	Inductive load, T _J =25°C I _C =I _{C90} ; V _{GE} =15V; 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		62 54 260 30 1.4		ns ns ns ns mJ
t _{d(on)} t _{ri} E _{on} t _{d(off)} t _{fi} E _{off}	Inductive load, T _J =150°C I _C =I _{C100} ; V _{GE} =15V; 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		55 54 3.5 300 38 1.85		ns ns mJ ns ns mJ
R _{thJC(IGBT)}				0.45	°C/W
R _{thJA(IGBT)}				40	°C/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; T _{VJ} =150°C T _{VJ} =25°C		1.9 2.2		V
I _{RM}	V _R =100V; I _F =40A; -di _F /dt=100A/us L≤0.05uH; T _{VJ} =100°C		5.4		A
t _{rr}	I _F =1A; -di _F /dt=50A/us; V _R =30V; T _J =25°C		70		ns
R _{thJC}	Diode			0.80	K/W



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Discrete IGBTs

Features

- Trench Field Stop IGBT technology
- Low switching losses
- Switching frequency up to 20KHz
- High short circuit capability
- Positive temperature coefficient for easy paralleling
- MOS input, voltage controlled
- Ultra fast free wheeling diodes

Application

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

Advantages

- space and weight savings
- reduced protection circuits

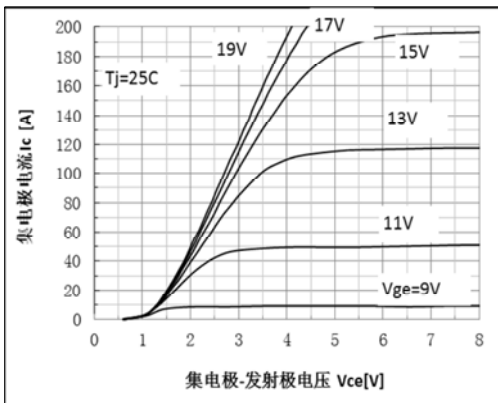


图 1 输出特性曲线

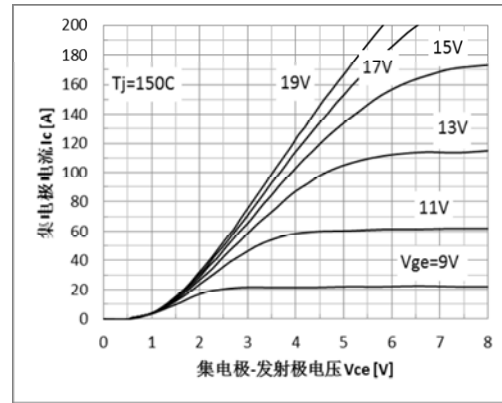


图 2 输出特性曲线

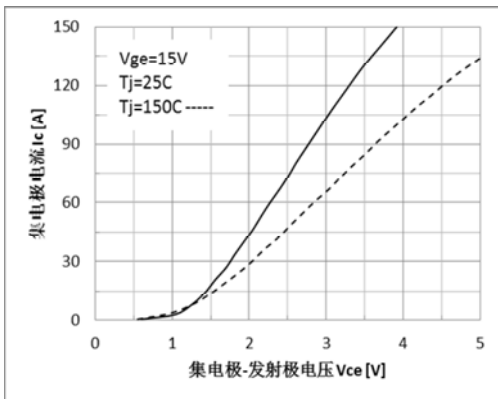


图 3 饱和压降特性

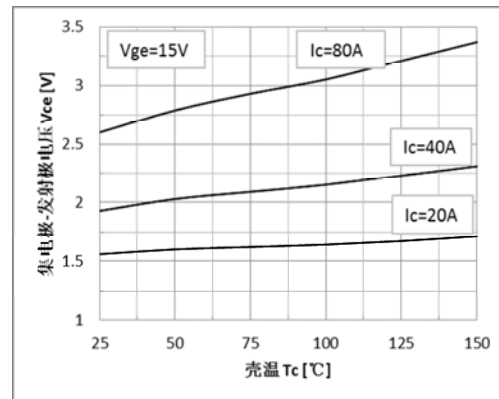


图 4 饱和压降温度特性

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Discrete IGBTs

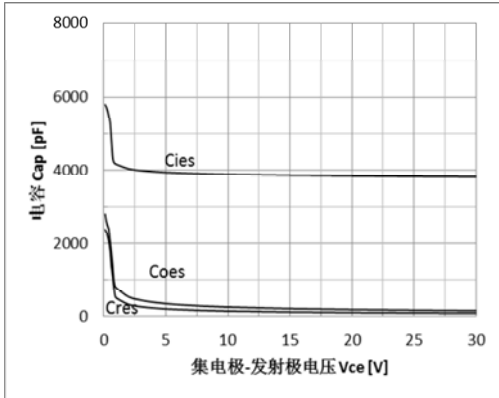


图 5 电容特性

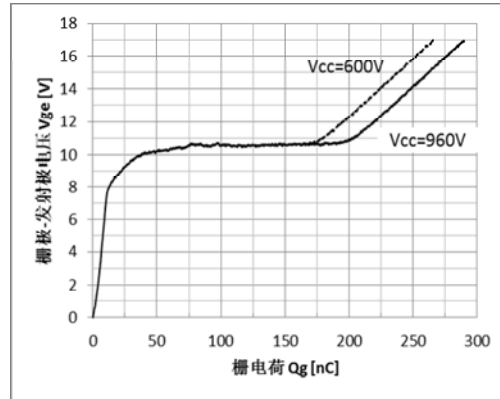


图 6 栅电荷特性

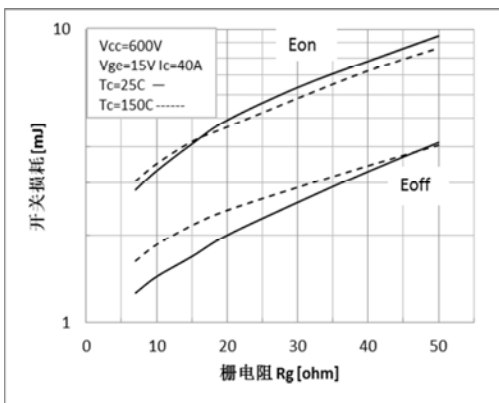


图 7 开关损耗-栅电阻特性曲线

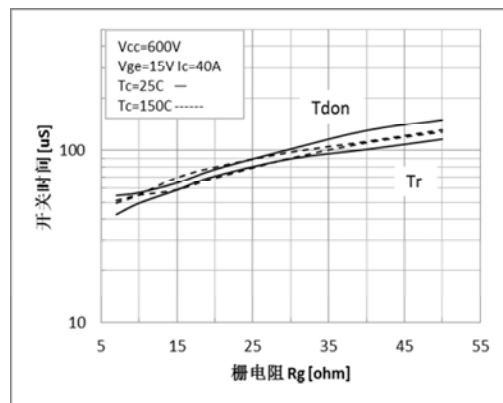


图 8 开通-栅电阻特性曲线

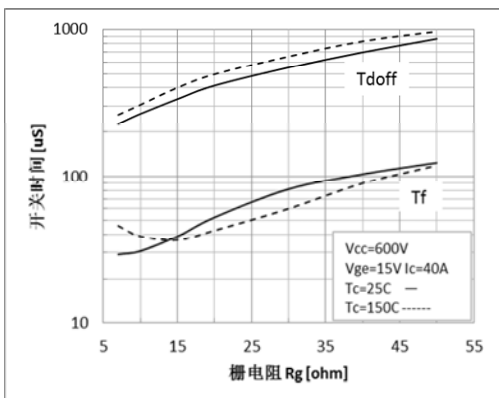


图 9 关断-栅电阻特性曲线

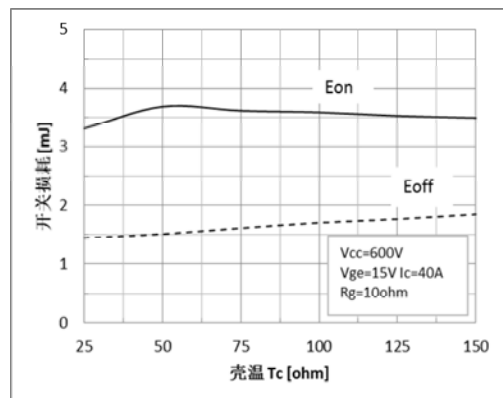


图 10 开关损耗温度特性

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Discrete IGBTs

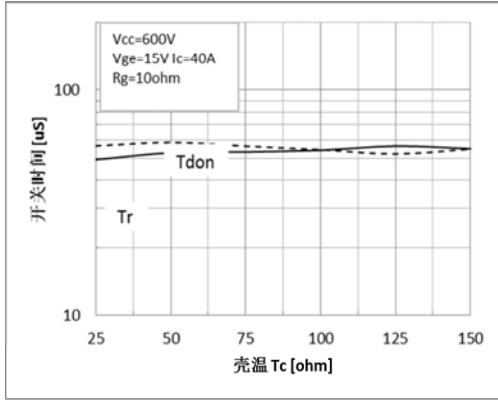


图 11 开通温度特性

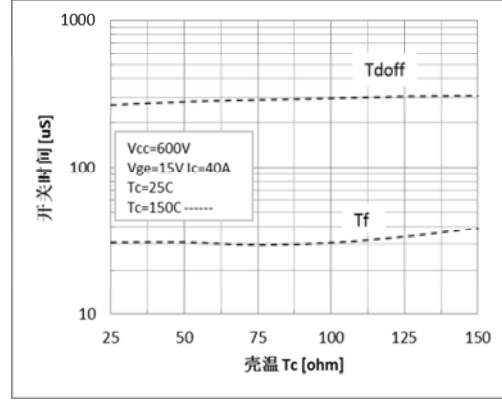


图 12 关断温度特性

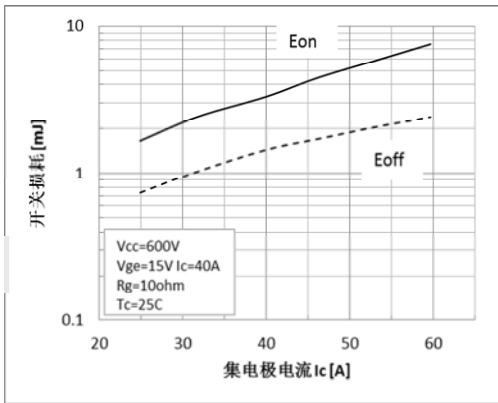


图 13 开关损耗与电流特性

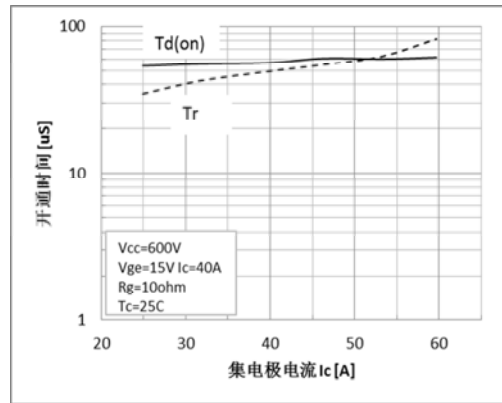


图 14 开通与电流特性

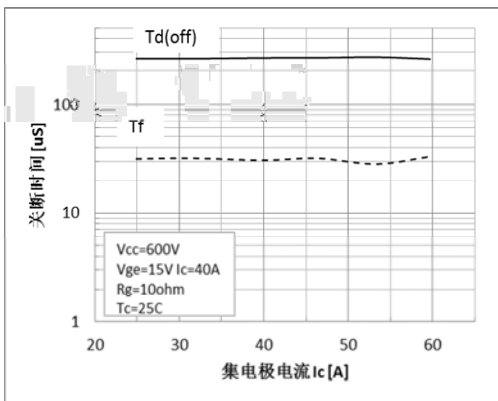


图 15 关断与电流特性

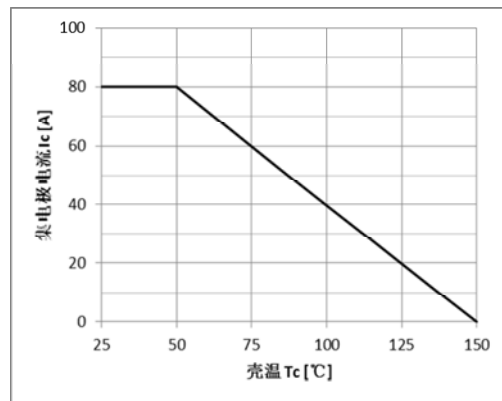


图 16 集电极电流温度特性

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Discrete IGBTs

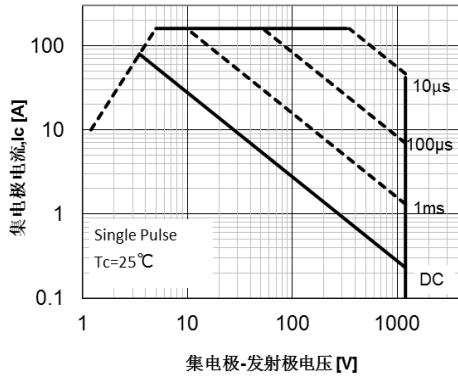


图 17 正向安全工作区

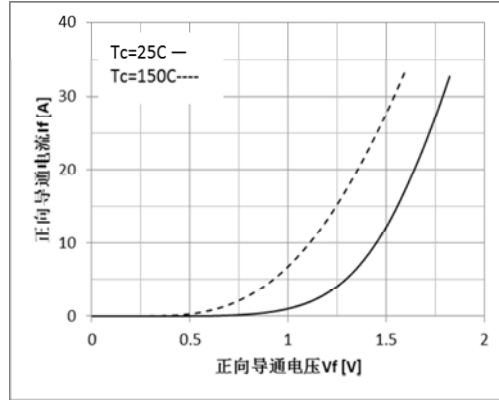


图 18 二极管正向特性

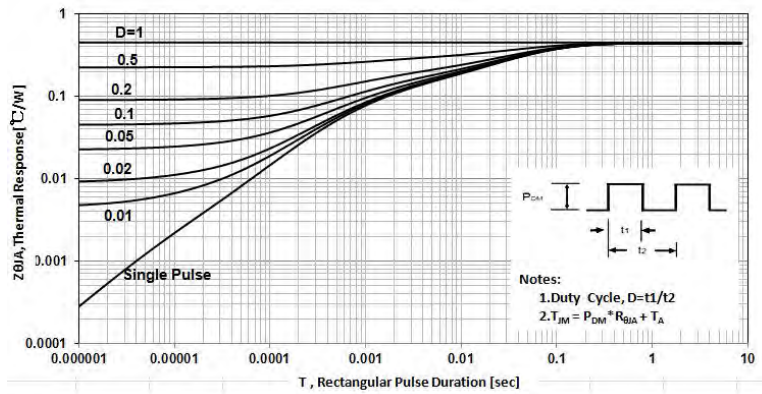
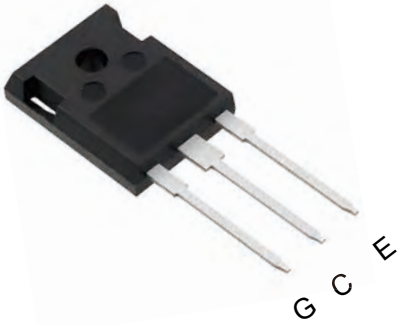


图 19 瞬态热阻特性

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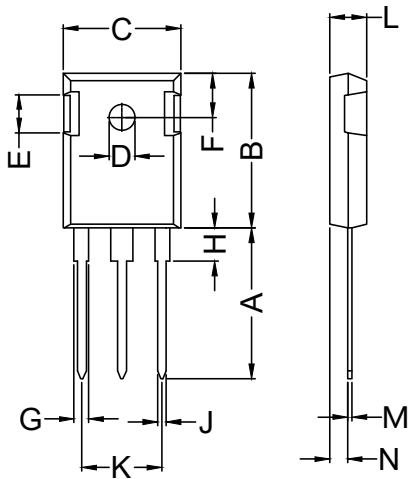
Discrete IGBTs

Dimensions TO-247AD

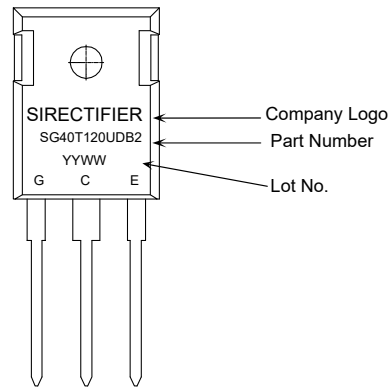


SG40T120UDB2

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



ORDERING INFORMATION

Part Number	Package	Shipping	Marking Code
SG40T120UDB2	TO-247AD	30pcs / Tube	SG40T120UDB2