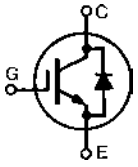
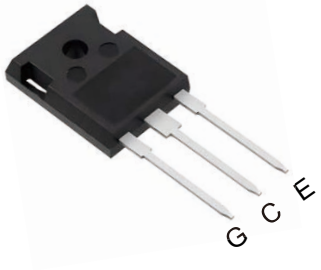
SG40T120UDB2

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 V_{GE}=0V; T_J=125°C			250 4	uA 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

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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≤300us, duty cycle≤2%		33		S
$I_{C(ON)}$	V_{GE}=10V; V_{CE}=10V		140		A
C_{ies}	V_{CE}=25V; V_{GE}=0V; f=1MHz		6140		pF
C_{oes}			170		
C_{res}			100		
Q_g	I_C=I_{C90}; V_{GE}=15V; V_{CE}=0.5V_{CES}		230		nC
Q_{ge}			30		
Q_{gc}			147		
$t_{d(on)}$	Inductive load, T_J=25°C		62		ns
t_{ri}	I_C=I_{C90}; V_{GE}=15V;		54		ns
$t_{d(off)}$	V_{CE}=0.5V_{CES}'; R_G=R_{off}=10Ω		260		ns
t_{fi}	Remarks:Switching times may increase for V_{CE}(Clamp)＞0.8V_{CES}' higher T_J or increased R_G		30		ns
E_{off}			1.4		mJ
$t_{d(on)}$	Inductive load, T_J=150°C		55		ns
t_{ri}	I_C=I_{C100}; V_{GE}=15V;		54		ns
E_{on}	V_{CE}=0.5V_{CES}'; R_G=R_{off}=10Ω		3.5		mJ
$t_{d(off)}$	Remarks:Switching times may increase		300		ns
t_{fi}	for V_{CE}(Clamp)＞0.8V_{CES}' higher T_J or		38		ns
E_{off}	increased R_G		1.85		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/dt=50A/us; V_R=30V; T_J=25°C		70		ns
R_{thJC}	Diode			0.80	K/W

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SG40T120UDB2

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 parallelling
- 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

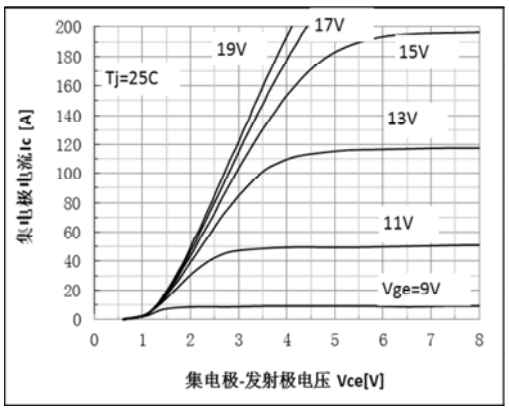

图 1 输出特性曲线

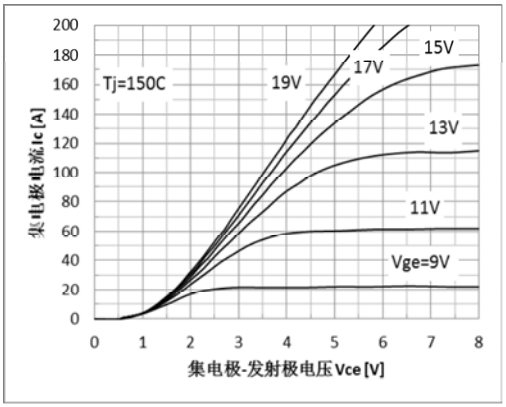

图 2 输出特性曲线

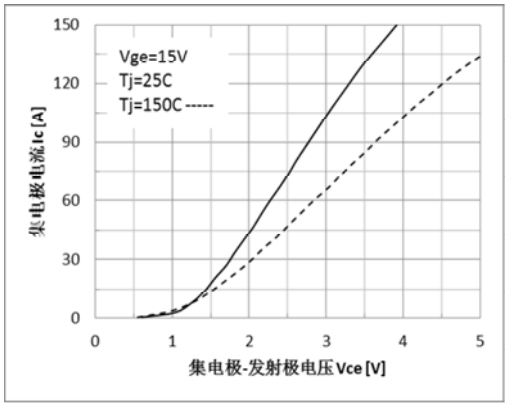

图 3 饱和压降特性

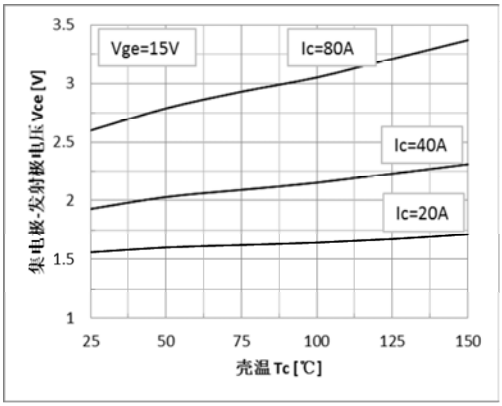

图 4 饱和压降温度特性

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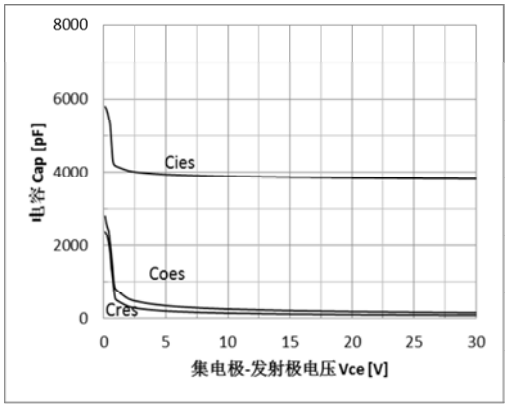

图 5 电容特性

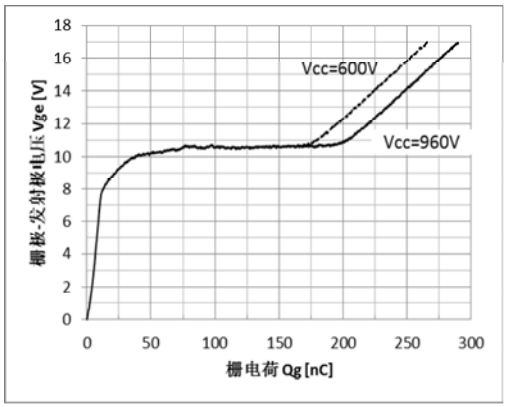

图 6 栅电荷特性

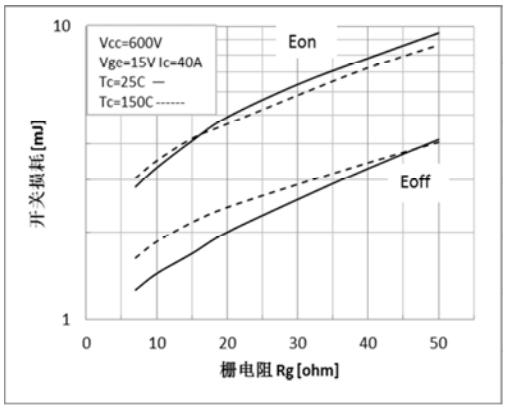

图 7 开关损耗-栅电阻特性曲线

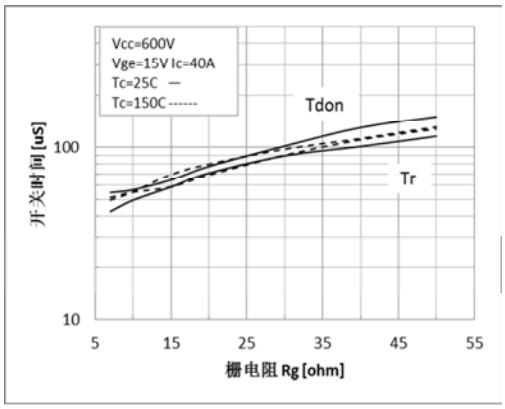

图 8 开通-栅电阻特性曲线

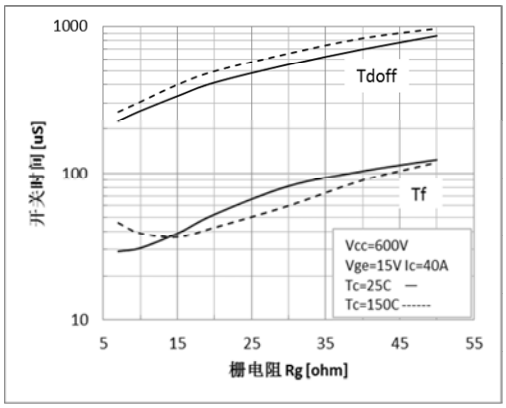

图 9 关断-栅电阻特性曲线

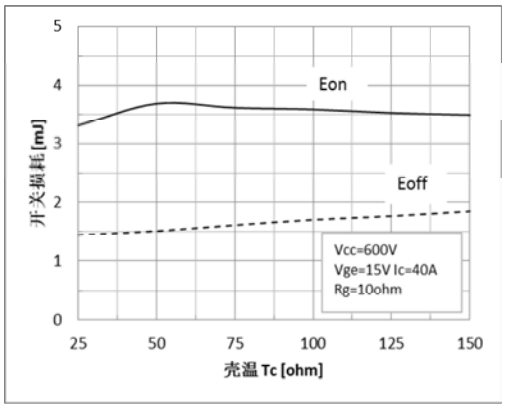

图 10 开关损耗温度特性

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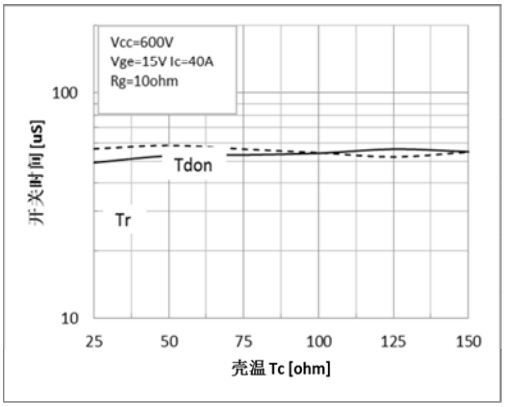

图 11 开通温度特性

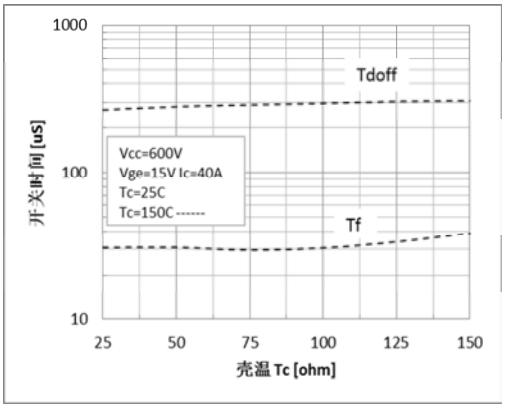

图 12 关断温度特性

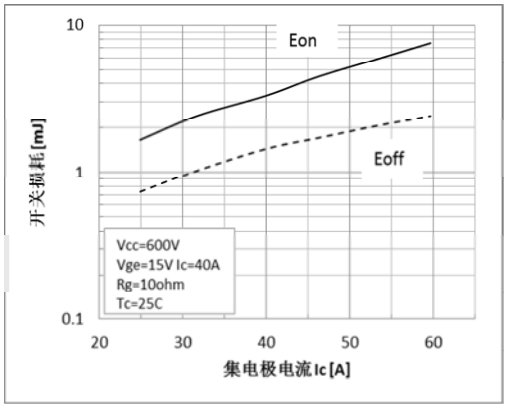

图 13 开关损耗与电流特性

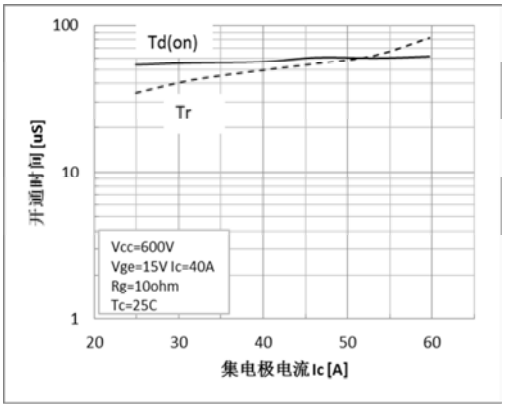

图 14 开通与电流特性

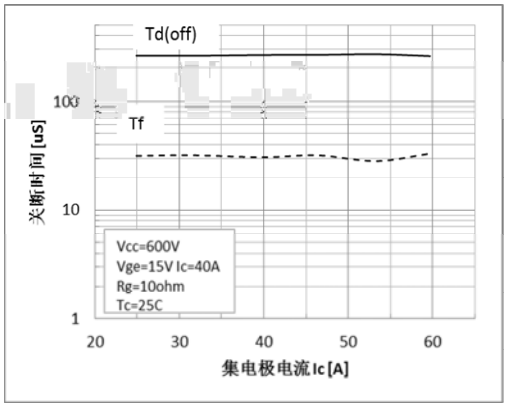

图 15 关断与电流特性

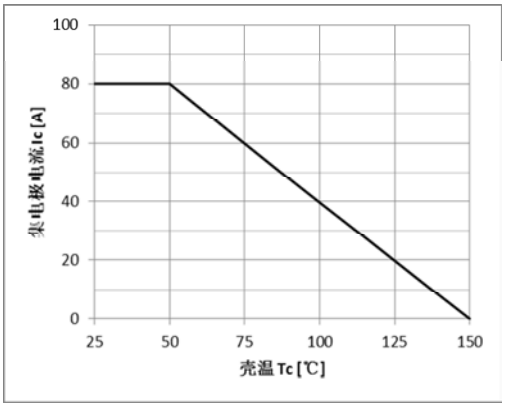

图 16 集电极电流温度特性

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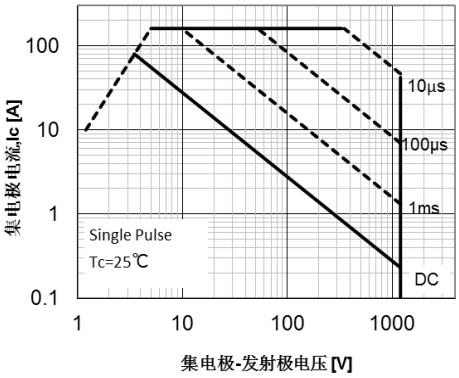

图 17 正向安全工作区

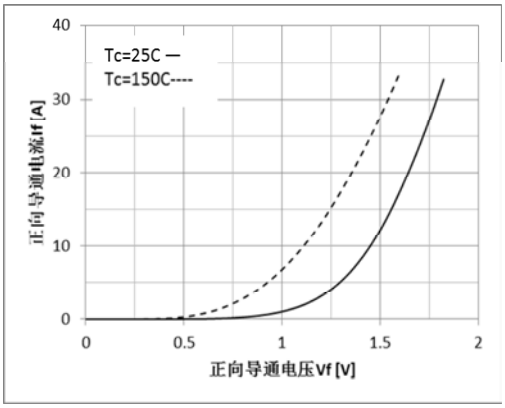

图 18 二极管正向特性

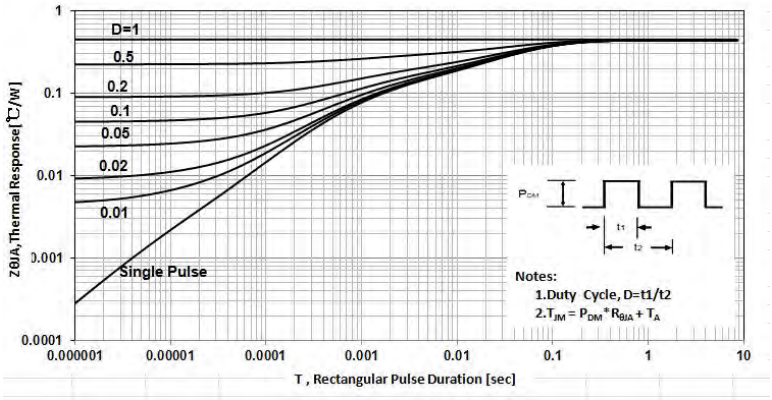

图 19 瞬态热阻特性

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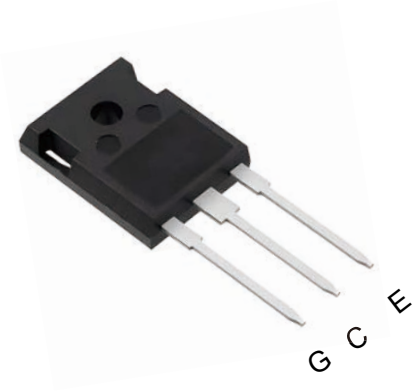
SG40T120UDB2

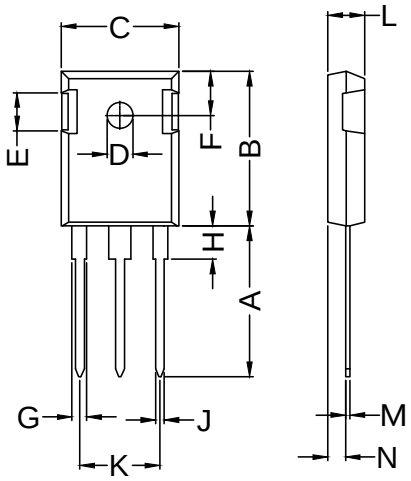
Discrete IGBTs

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....



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