

SG40T120UDB

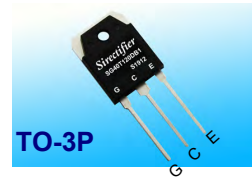
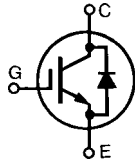
Discrete IGBTs

$$V_{CES} = 1200V$$

$$I_{C100} = 40A$$

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

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



SG40T120UDB1



SG40T120UDB2



G=Gate栅极
 C=Collector集电极
 E=Emitter发射极
 TAB底板=Collector集电极
 其中SG40T120DB4 是绝缘式的



SG40T120UDB3



SG40T120UDB4(Isolated)

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 $150^{\circ}C$; $R_{GE}=1 M\Omega$;	1200 1200	V
V_{GES} V_{GEM}	Continuous Transient	± 20 ± 30	V
I_{C25} I_{C100} I_{CM}	$T_C=25^{\circ}C$; limited by leads $T_C=100^{\circ}C$ $T_C=25^{\circ}C$, 1 ms	80 40 160	A
SSOA (RBSOA)	$V_{GE}=15V$; $T_{VJ}=125^{\circ}C$; $R_G=5 \Omega$ Clamped inductive load	$I_{CM}=120$ @ 0.8 V_{CES}	A
P_c	$T_C=25^{\circ}C$	280	W
T_J T_{JM} T_{stg}		-55...+175 175 -55...+150	$^{\circ}C$
	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	$^{\circ}C$ $^{\circ}C$
M_d	Mounting torque (M3)	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}	$I_C=1mA$; $V_{GE}=0V$	1200			V
$V_{GE(th)}$	$I_C=250\mu A$; $V_{CE}=V_{GE}$	4.5	5.8	7.0	V
I_{CES}	$V_{CE}=V_{CES}$; $T_J=25^{\circ}C$ $V_{GE}=0V$; $T_J=125^{\circ}C$			250 4	μA mA
I_{GES}	$V_{CE}=0V$; $V_{GE}=\pm 20V$			± 200	nA
$V_{CE(sat)}$	$I_C=I_{C100}$; $V_{GE}=15V$		1.90	2.40	V



SG40T120UDB

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} C _{oes} C _{res}	V _{CE} =25V; V _{GE} =0V; f=1MHz		3823 170 94		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		2.6 3.3		V
I _{RM}	V _R =100V; I _F =40A; -di _F /dt=100A/us L _≤ 0.05uH; T _{VJ} =100°C		7.4		A
t _{rr}	I _F =1A; -di _F /dt=50A/us; V _R =30V; T _J =25°C		70		ns
R _{thJC}	Diode			0.40	K/W



SG40T120UDB

Discrete IGBTs

Features

- Trench Field Stop IGBT technology
- Low switching losses
- Switching frequency up to 30KHz
- 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

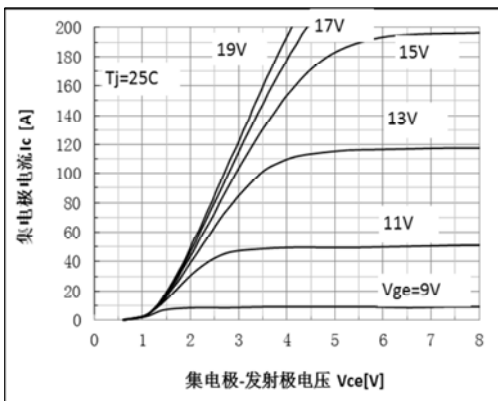


图 1 输出特性曲线

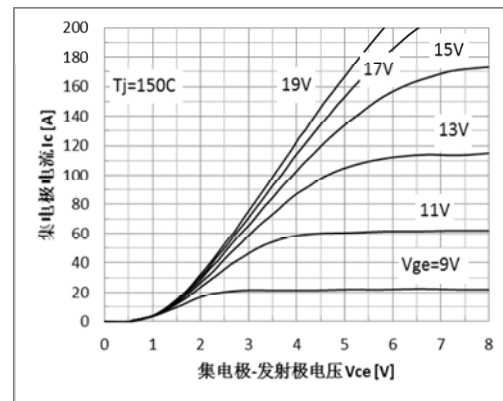


图 2 输出特性曲线

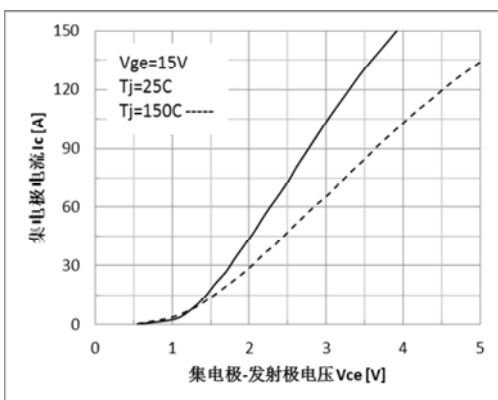


图 3 饱和压降特性

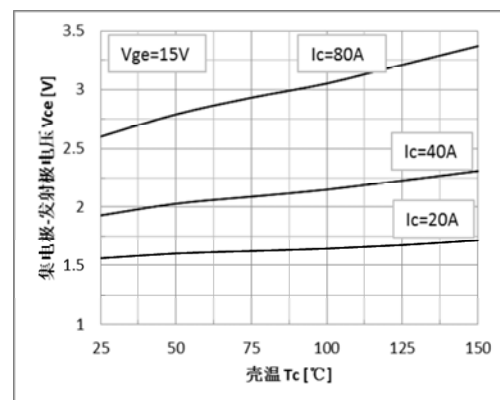


图 4 饱和压降温度特性

SG40T120UDB

Discrete IGBTs

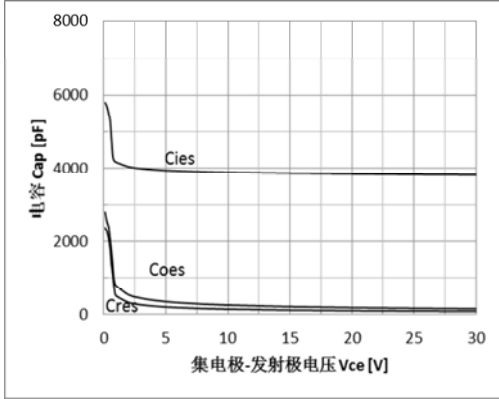


图 5 电容特性

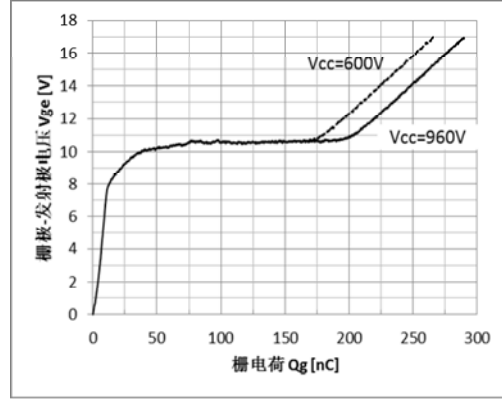


图 6 栅电荷特性

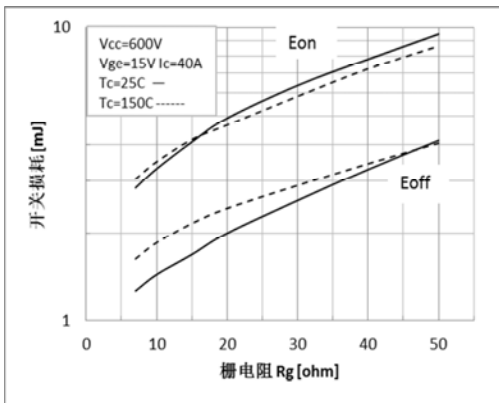


图 7 开关损耗-栅电阻特性曲线

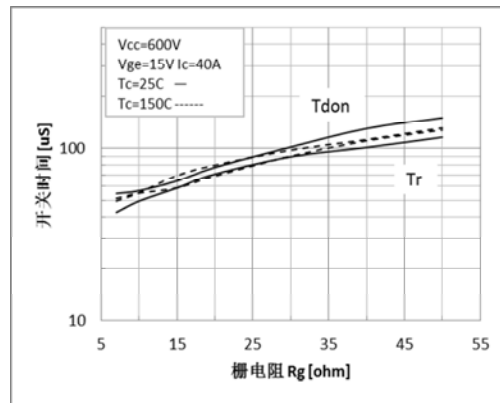


图 8 开通-栅电阻特性曲线

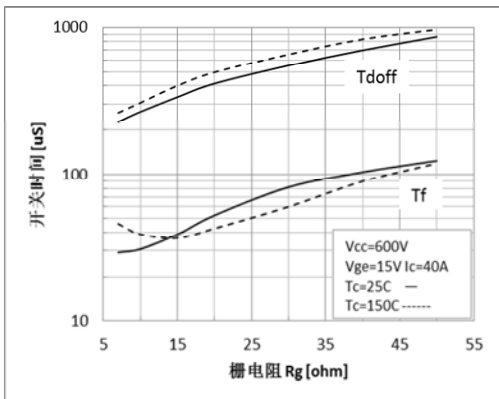


图 9 关断-栅电阻特性曲线

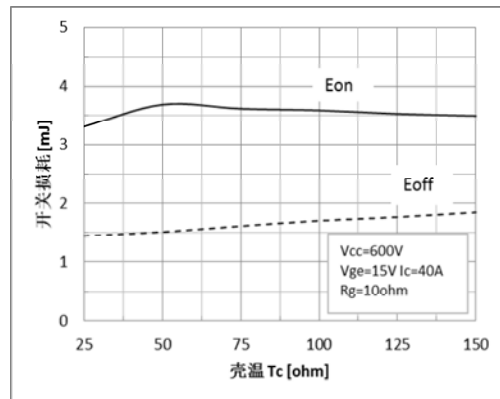


图 10 开关损耗温度特性



SG40T120UDB

Discrete IGBTs

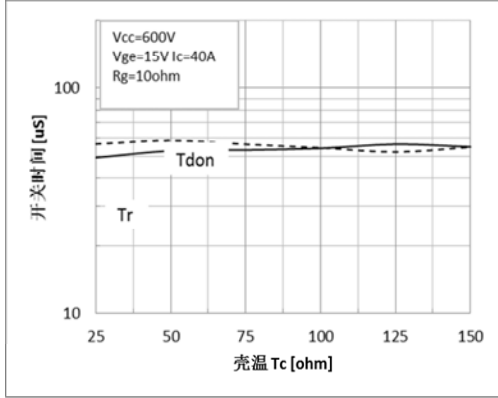


图 11 开通温度特性

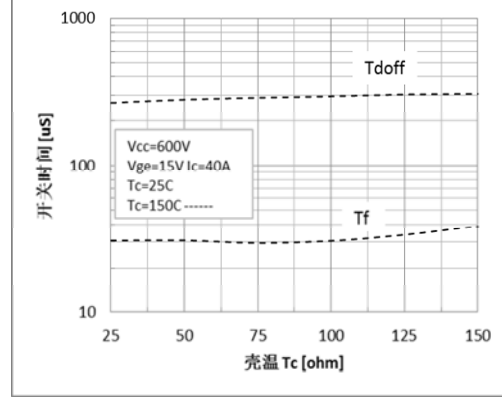


图 12 关断温度特性

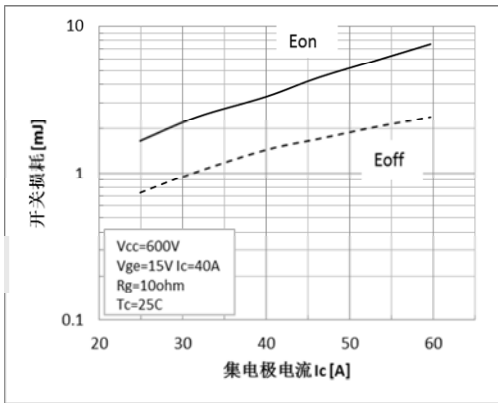


图 13 开关损耗与电流特性

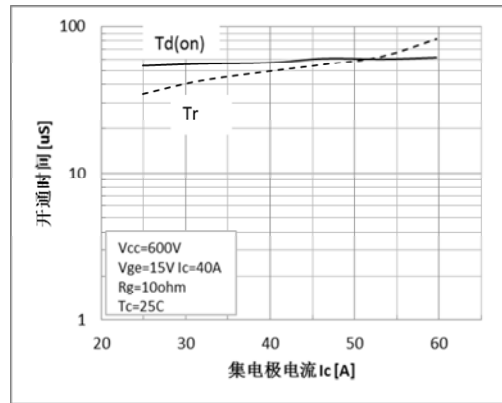


图 14 开通与电流特性

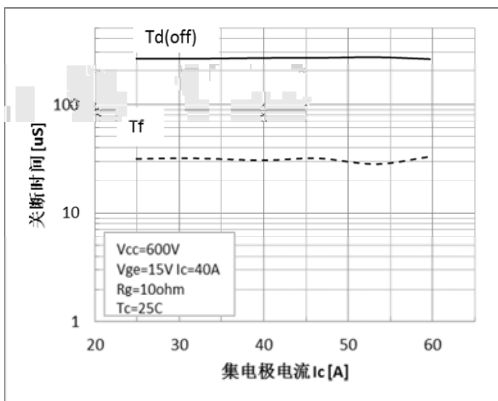


图 15 关断与电流特性

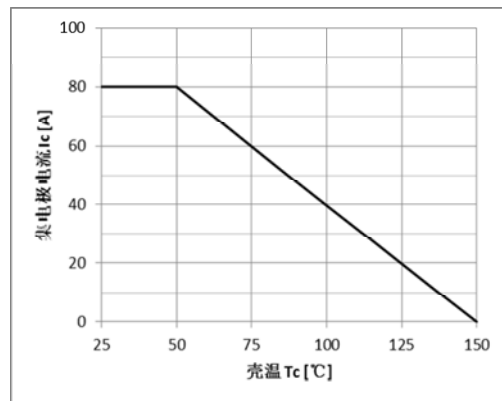


图 16 集电极电流温度特性



SG40T120UDB

Discrete IGBTs

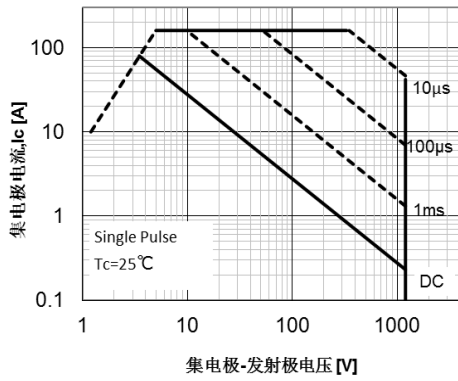


图 17 正向安全工作区

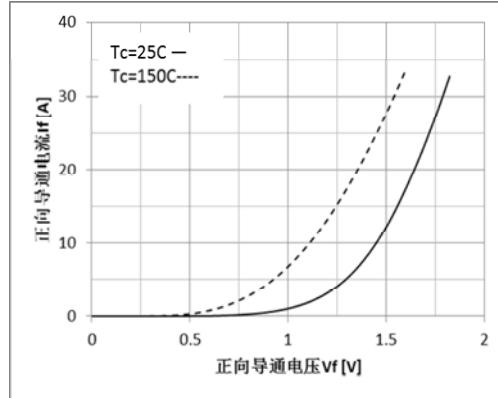


图 18 二极管正向特性

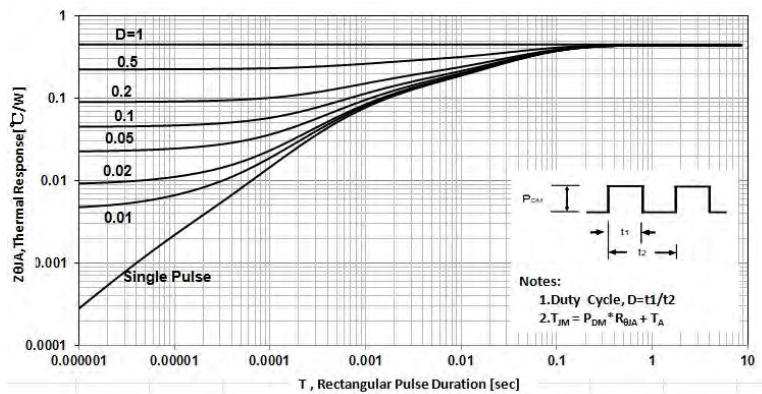


图 19 瞬态热阻特性

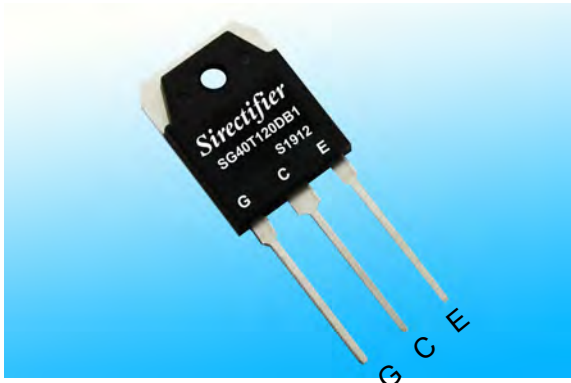


SG40T120UDB

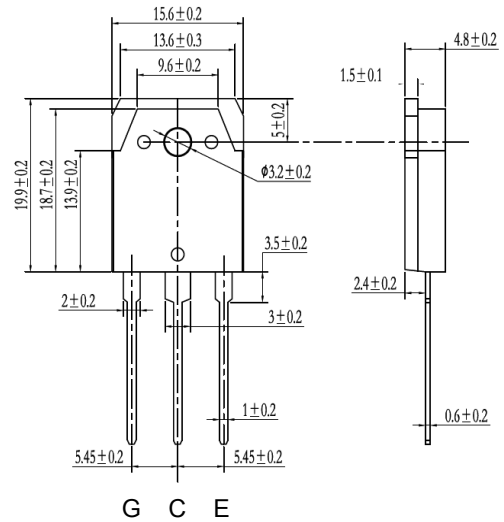
Discrete IGBTs

Dimensions

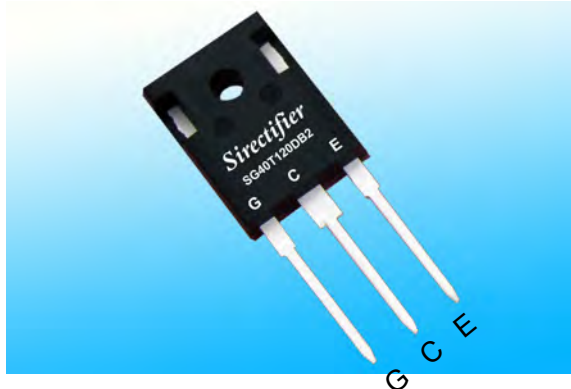
TO-3P



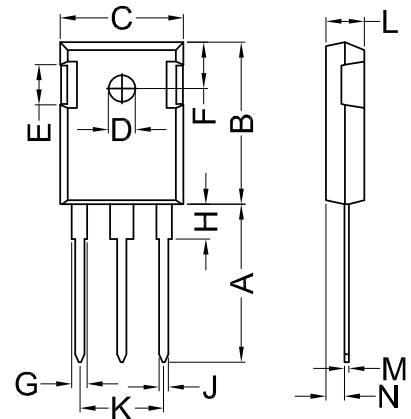
SG40T120UDB1 (封装外形 TO-3P)



TO-247AD



SG40T120UDB2 (封装外形 TO-247AD)



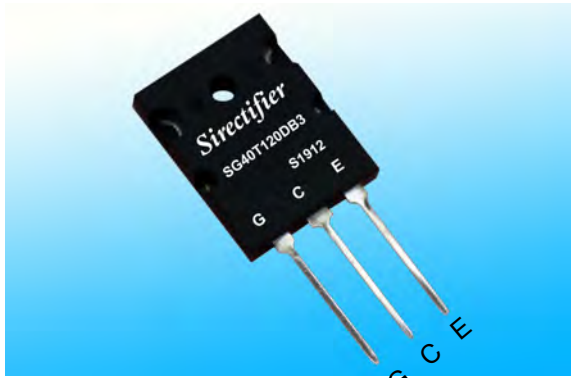
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
ØD	3.15	3.65	0.124	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.3	0.212	0.248
G	1.65	2.18	0.065	0.086
H	3.80	4.5	0.149	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.1	0.426	0.437
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102



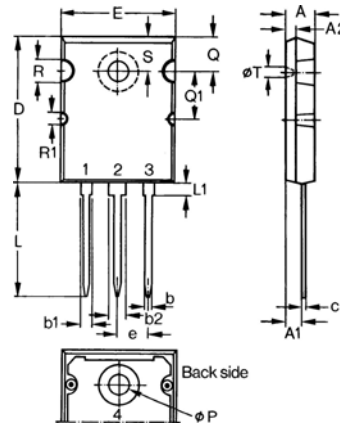
SG40T120UDB

Discrete IGBTs

TO-264

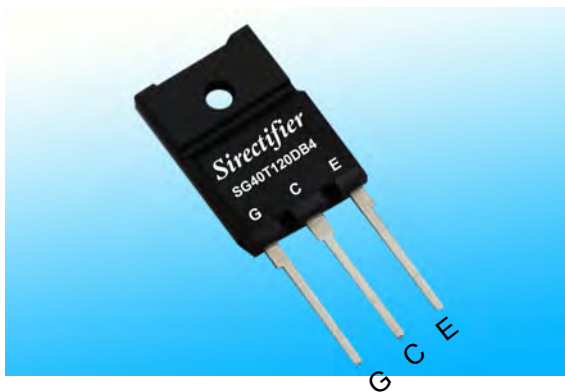


SG40T120UDB3 (封装外形TO-264)

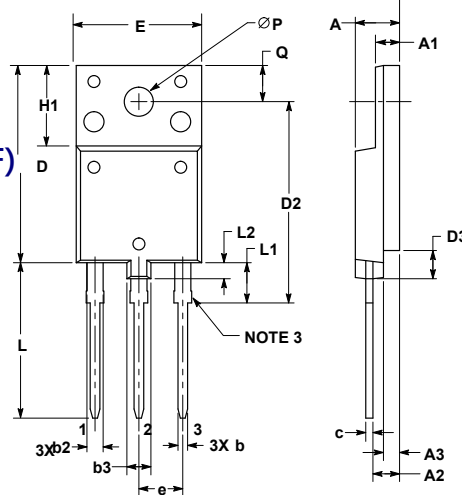


Dim.	Millimeter	
	Min.	Max.
A	4.82	5.13
A1	2.54	2.89
A2	2.00	2.10
b	1.12	1.42
b1	2.39	2.69
b2	2.90	3.09
c	0.53	0.83
D	25.91	26.16
E	19.81	19.96
e	5.46 BSC	
J	0.00	0.25
K	0.00	0.25
L	20.32	20.83
L1	2.29	2.59
P	3.17	3.66
Q	6.07	6.27
Q1	8.38	8.69
R	3.81	4.32
R1	1.78	2.29
S	6.04	6.30
T	1.57	1.83

TO-3PF



SG40T120UDB4 (封装外形绝缘式TO-3PF)



DIM	MILLIMETERS	
	MIN	MAX
A	5.30	5.70
A1	2.80	3.20
A2	3.10	3.50
A3	1.80	2.20
b	0.65	0.95
b2	1.90	2.15
b3	3.80	4.20
c	0.80	1.10
D	24.30	24.70
D2	24.70	25.30
D3	3.30	3.70
E	15.30	15.70
e	5.35	5.55
H1	9.80	10.20
L	19.10	19.50
L1	4.80	5.20
L2	1.90	2.20
P	3.40	3.80
Q	4.30	4.70

