گروه فنی مهندسی جوش و برش مقدم

اعتماد از شما کیفیت و تخصص از ما

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مشهد خیام شمالی 63 خیابان پردیس 3

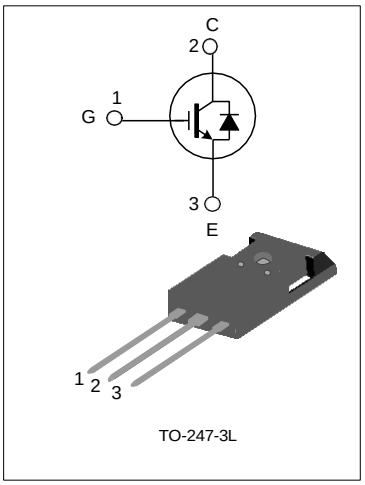
برای کسب اطلاعات بیشتر بر روی لینک ها کلیک کنید

- 7 سال سابقه آموزش تعمیرات تخصصی دستگاه های جوش اینورتری تک فاز و 3 فاز
- 7 سال سابقه فروش قطعات الکترونیکی دستگاه جوش تک فاز و 3 فاز
- آموزش تخصصی تحلیل دستگاه های جوش اینورتری مختص ابراز فروشان
- آموزش تخصصی ابراز آلات شارژی

40A, 1200V FIELD STOP IGBT

DESCRIPTION

The SGT40U120FDR1P7 field stop IGBT adopts Silan Trench Gate Field Stop IV+ technology, features low conduction loss and switching loss, positive temperature coefficient for easy parallel operation. This device is applicable to industrial welding, UPS, SMPS, and photovoltaic fields.



FEATURES

- 40A, 1200V, $V_{CE(sat)(typ.)}$=2.2V@I_C=40A
- Low conduction loss
- Fast switching
- High breakdown voltage

NOMENCLATURE

SGT 40 U 120 F D R 1 P7

- IGBT series
- Current, 70: 70A
- N : N Channel
  NE : N-channel planar gate with ESD
  T : Field Stop 3/4
  U : Field Stop 4+
  V : Field Stop 5
  W: Field Stop 6
  X : Field Stop 7
- Voltage, 65: 650V
  120: 1200V
- Package
  P7 : TO-247-3L
- 1,2,3··· : Version No.
- Blank: Standard diode
  M : Standard Diode, full range
  R : Rapid Diode
  B : Rapid Diode, full range
  S : Soft Diode, full range
- D : Packaged with fast recovery diode
  R : RC IGBT
- L : Ultra low switching, recommended frequency ~2KHz
  Q : Low switching, recommended frequency 2~20KHz
  S : Standard frequency, recommended frequency 5~40KHz
  F : Fast switching, recommended frequency10~60KHz
  UF : Ultra fast switching, recommended frequency 40KHz~

ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SGT40U120FDR1P7	TO-247-3L	40U120FDR1	Pb free	Tube

ABSOLUTE MAXIMUM RATINGS (UNLESS OTHERWISE NOTED, T_C=25°C)

Characteristics		Symbol	Ratings	Unit
Collector to Emitter Voltage		V_{CE}	1200	V
Gate to Emitter Voltage		V_{GE}	±20	V
Transient Gate to Emitter Voltage (t_p≤10μs, D<0.010)		V_{GE}	±30	V
Collector Current	T_C=25°C	I_C	80	A
	T_C=100°C		40	
Pulsed Collector Current		I_{CM}	160	A
Diode Current	T_C=25°C	I_F	40	A
	T_C=100°C		20	
Pulsed Diode Current		I_{FM}	80	A
Power Dissipation (T_C=25°C)		P_D	312	W
-Derate above 25°C			2.5	W/°C
Operating Junction Temperature		T_J	-55 ~ +150	°C
Storage Temperature Range		T_{stg}	-55 ~ +150	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Ratings	Unit
Thermal Resistance, Junction to Case (IGBT)	$R_{\theta JC}$	0.4	°C/W
Thermal Resistance, Junction to Case (FRD)	$R_{\theta JC}$	1.2	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	40	°C/W

ELECTRICAL CHARACTERISTICS OF IGBT (UNLESS OTHERWISE NOTED, T_C=25°C)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Collector to Emitter Breakdown Voltage	BV_{CE}	V_{GE}=0V, I_C=1mA	1200	--	--	V
C-E Leakage Current	I_{CES}	V_{CE}=1200V, V_{GE}=0V	--	--	500	μA
G-E Leakage Current	I_{GES}	V_{GE}=20V, V_{CE}=0V	--	--	±400	nA
G-E Threshold Voltage	$V_{GE(th)}$	I_C=250μA, V_{CE}=V_{GE}	4.8	6.4	8	V
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=40A, V_{GE}=15V, T_J=25C	--	2.2	2.7	V
		I_C=40A, V_{GE}=15V, T_J=125°C	--	2.5	--	V
Input Capacitance	C_{ies}	V_{CE}=30V, V_{GE}=0V, f=1MHz	--	4404	--	pF
Output Capacitance	C_{oes}		--	140	--	
Reverse Transfer Capacitance	C_{res}		--	30	--	
Turn-On Delay Time	$T_{d(on)}$	V_{CE}=600V, I_C=40A, R_g=10Ω V_{GE}=15V, inductive load T_J=25°C	--	44	--	ns
Rise Time	T_r		--	118	--	
Turn-Off Delay Time	$T_{d(off)}$		--	102	--	
Fall Time	T_f		--	84	--	
Turn-On Switching Loss	E_{on}		--	3.9	--	mJ
Turn-Off Switching Loss	E_{off}		--	0.6	--	
Total Switching Loss	E_{st}		--	4.5	--	
Total Gate Charge	Q_g	V_{CE}=600V, I_C=40A, V_{GE}=15V	--	134	--	nC
Gate to Emitter Charge	Q_{ge}		--	44	--	
Gate to Collector Charge	Q_{gc}		--	46	--	

ELECTRICAL CHARACTERISTICS OF FRD (UNLESS OTHERWISE NOTED, T_C=25°C)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Diode Forward Voltage	V_{fm}	I_F=20A, T_J=25°C	--	2.4	3.1	V
		I_F=20A, T_J=125°C	--	1.9	--	
Diode Reverse Recovery Time	T_{rr}	V_{DD}=200V, I_{ES}=20A, dI_{ES}/dt=100A/μs, T_J=25°C	--	62	--	ns
Diode Reverse Recovery Charge	Q_{rr}		--	90	--	nC
Diode Peak Reverse Recovery Current	I_{rm}		--	2.8	--	A
Diode Reverse Recovery Current Tb Slope	Di_{rr}/Dt		--	104	--	A/μs

TYPICAL CHARACTERISTICS

Figure 1. Typical output characteristics

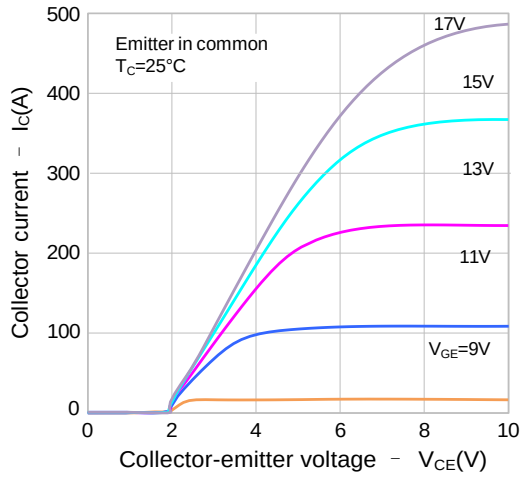


Figure 2. Typical saturation voltage characteristics

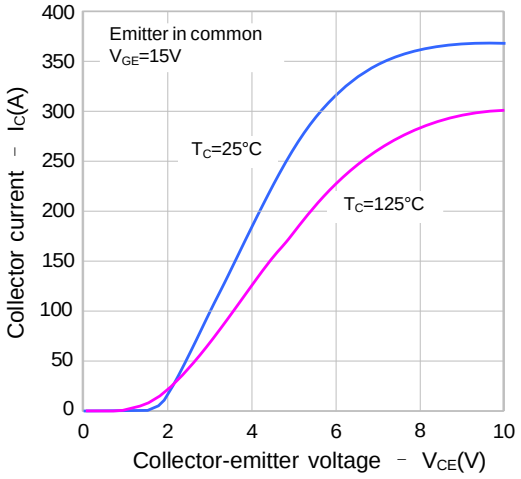


Figure 3. Transmission characteristics

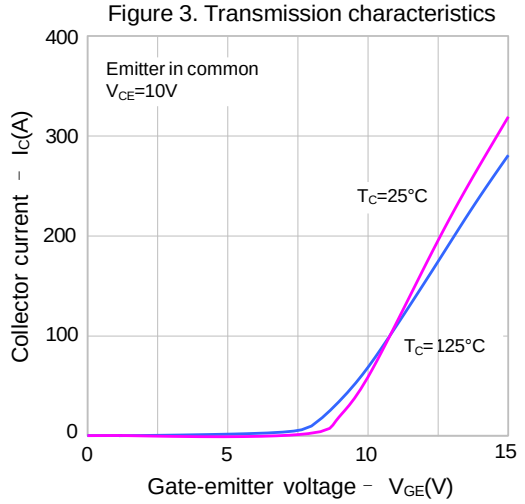


Figure 4. Saturation voltage vs. V_{GE}

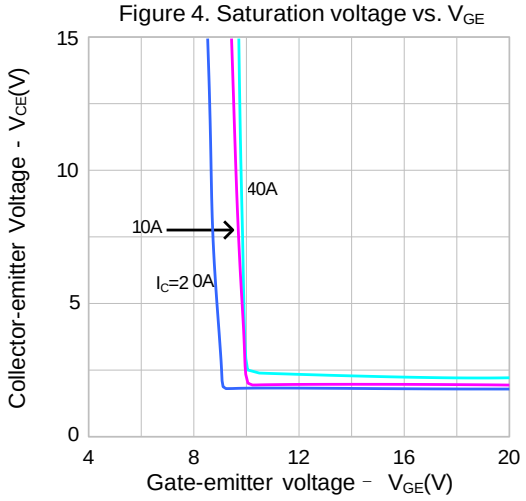


Figure 5. Saturation voltage vs. V_{GE}

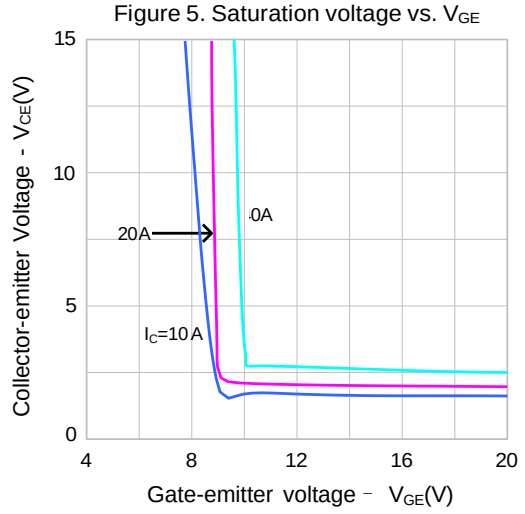
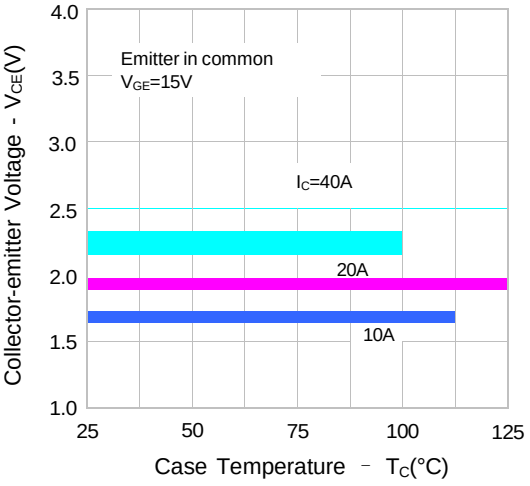


Figure 6. Saturation Voltage Drop vs. Temperature



TYPICAL CHARACTERISTICS (CONTINUED)

Figure 7. Capacitance Characteristics

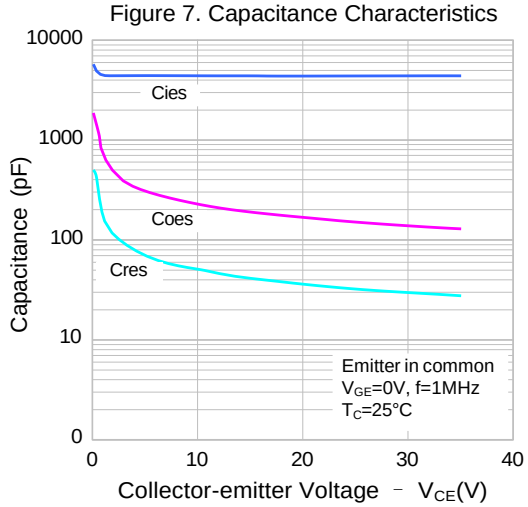


Figure 8. Gate Charge Characteristics

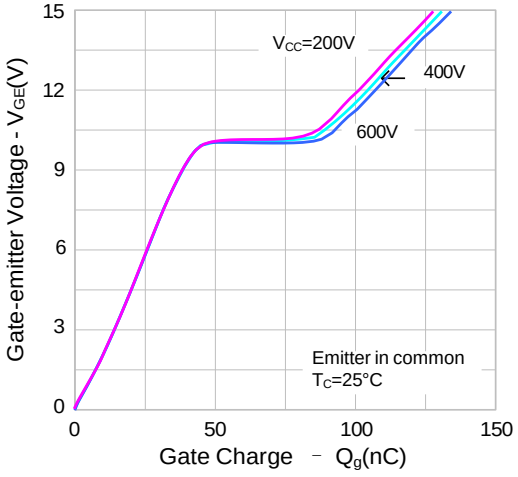


Figure 9. Turn-on Characteristics vs. Gate Resistance

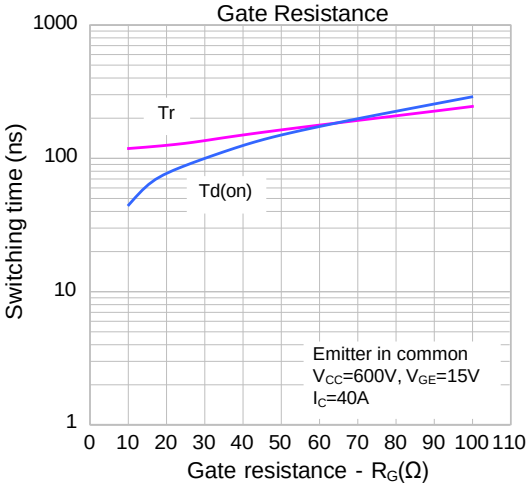


Figure 10. Turn-off characteristics vs. Gate resistance

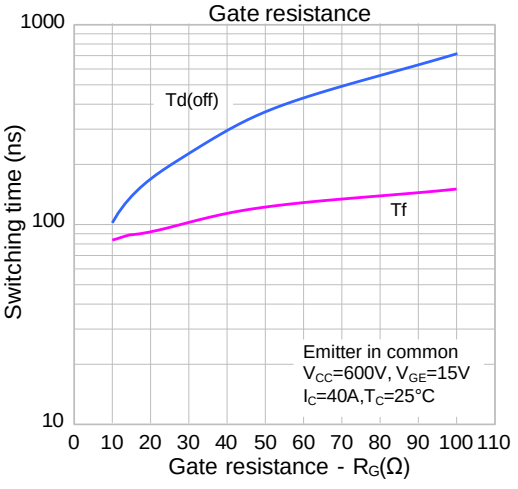


Figure 11. Switching Loss vs. Gate Resistance

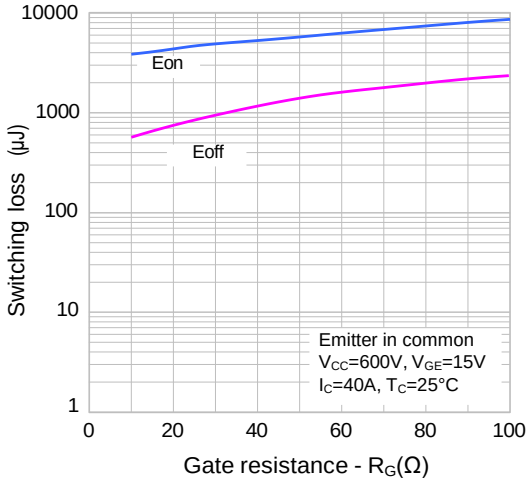
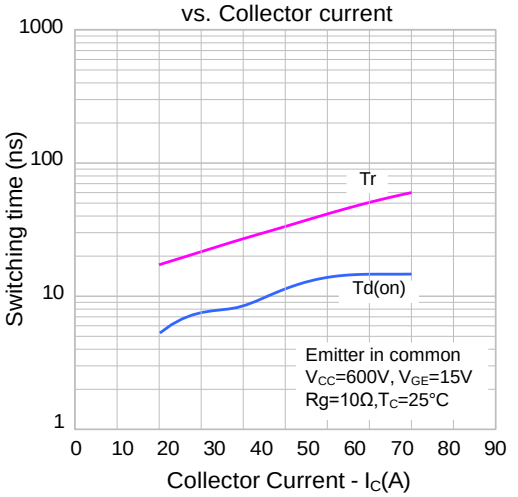


Figure 12. Conduction characteristics vs. Collector current



TYPICAL CHARACTERISTICS (CONTINUED)

Figure 13. Turn-off characteristics vs. Collector current

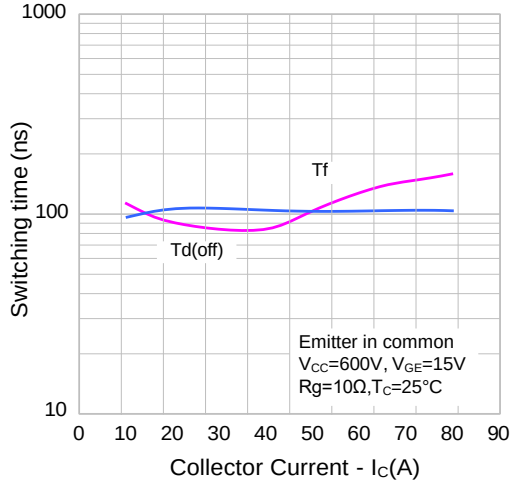


Figure 14. Switching Loss vs. Collector Current

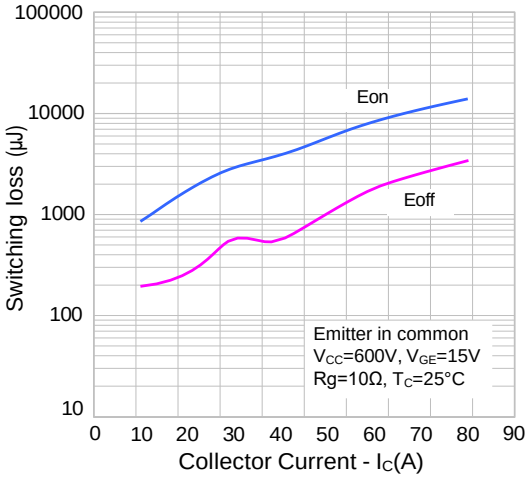


Figure 15. Forward characteristics

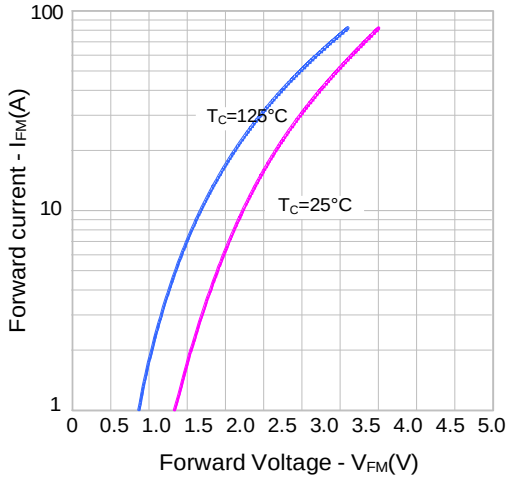


Figure 16. Reverse recovery time vs. Forward current

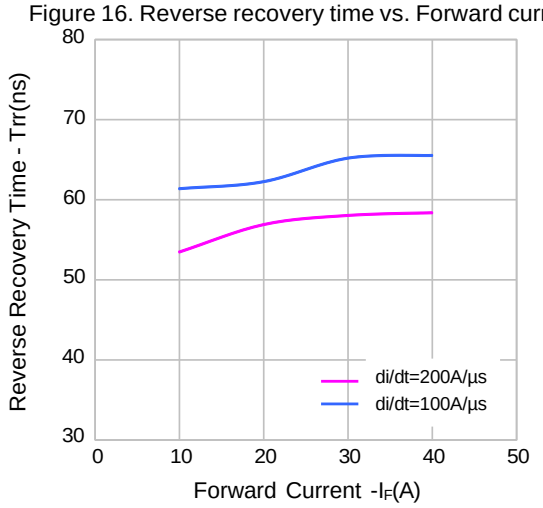


Figure 17. Reverse Recovery Charge vs. Forward Current

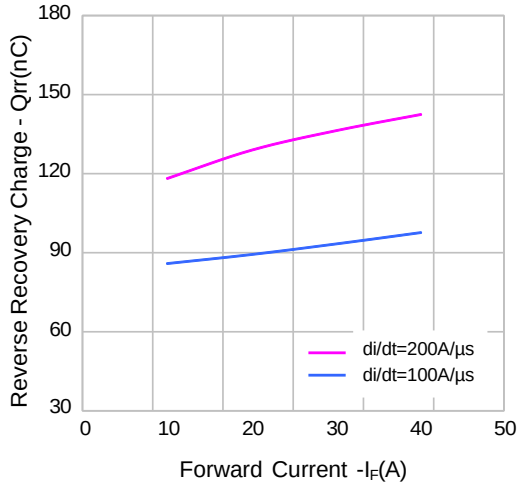
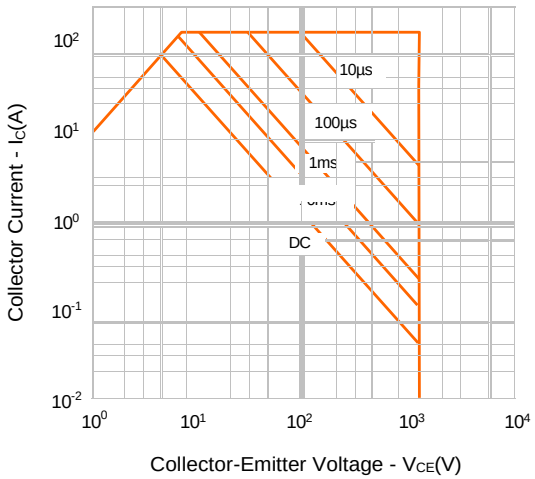


Figure 18. Max. Safe Operating Area



TYPICAL CHARACTERISTICS (CONTINUED)

Figure 19. Peak reverse recovery current vs. forward current

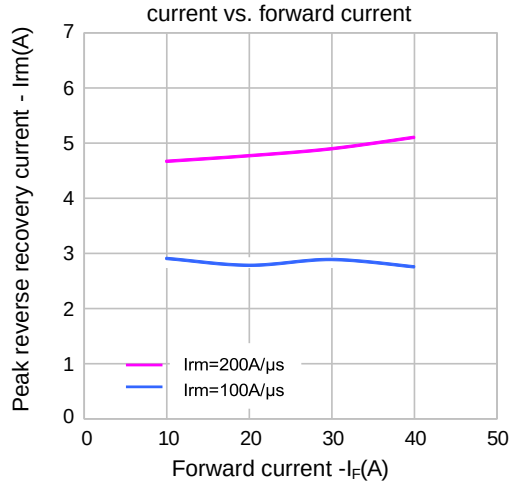
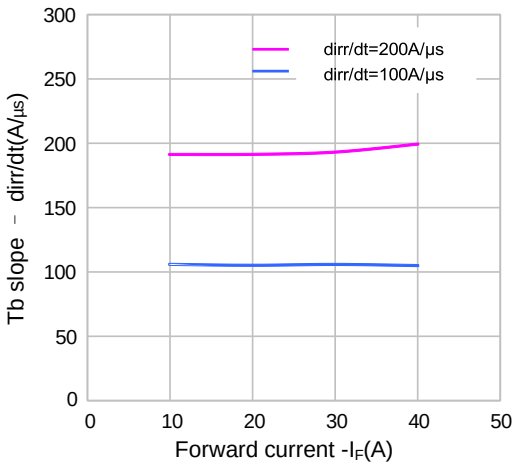
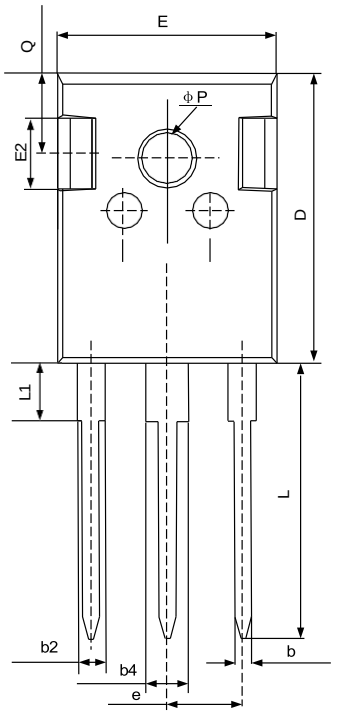


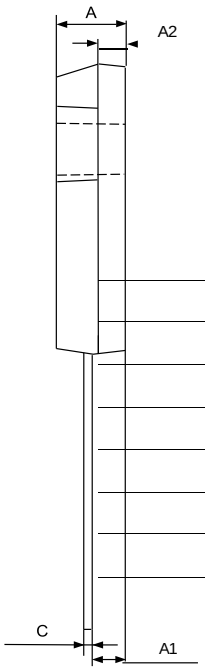
Figure 20. Tb slope vs. forward current



PACKAGE OUTLINE

TO-247-3L UNIT: mm





SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.59
A2	1.85	2.00	2.15
b	1.11	–	1.36
b2	1.91	–	2.25
b4	2.91	–	3.25
c	0.51	–	0.75
D	20.80	21.00	21.30
E	15.50	15.80	16.10
E2	4.40	5.00	5.20
e	5.44 BSC		
L	19.72	19.92	20.22
L1	–	–	4.30
Q	5.60	5.80	6.00
P	3.40	—	3.80

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Rev.: 1.3

Revision History:

1. Add V_{GE}

Rev.: 1.2

Revision History:

1. Update electrical characteristics
2. Update figures 15, 16, 17, 19 and 20

Rev.: 1.1

Revision History:

1. Update the typical characteristics

Rev.: 1.0

Revision History:

1. First release