

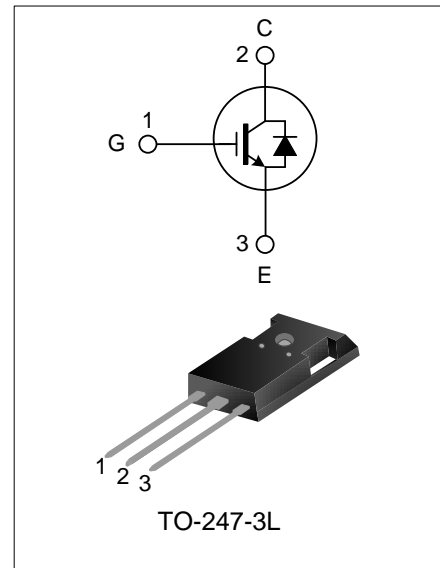
75A, 650V FIELD STOP IGBT

DESCRIPTION

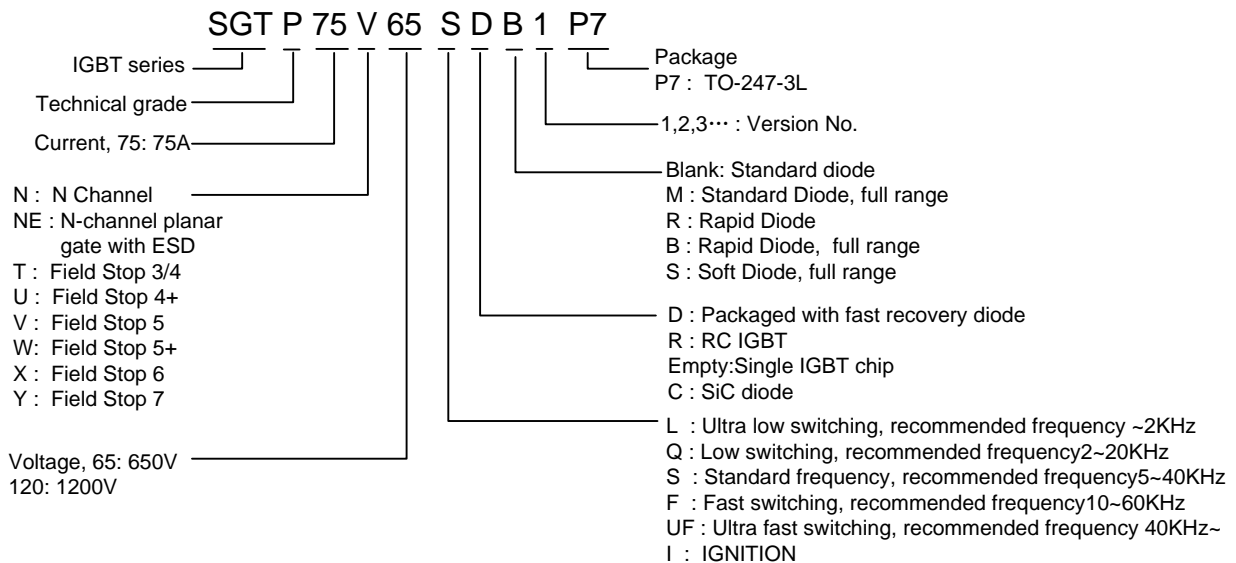
The SGTP75V65SDB1P7 field stop IGBT adopts Silan Field Stop V technology, features low conduction loss and switching loss. This device is applicable to photovoltaic, UPS, SMPS, and PFC fields.

FEATURES

- ◆ 75A, 650V, $V_{CE(sat)(typ.)}=1.42V@I_C=75A$
- ◆ Low conduction loss
- ◆ Ultra-fast switching
- ◆ High input impedance
- ◆ $T_{Jmax.}=175^{\circ}C$



NOMENCLATURE



ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SGTP75V65SDB1P7	TO-247-3L	P75V65SDB1	Halogen free	Tube

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

Characteristics		Symbol	Ratings	Unit
Collector to Emitter Voltage		V _{CE}	650	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	150	A
	T _C =100°C		75	
Pulsed Collector Current		I _{CM}	300	A
Diode Current	T _C =25°C	I _F	150	A
	T _C =100°C		75	A
Power Dissipation (T _C =25°C)		P _D	395	W
Operating Junction Temperature		T _J	-40~+175	°C
Storage Temperature Range		T _{stg}	-55~+150	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Thermal Resistance, Junction to Case (IGBT)	R _{θJC}	--	--	--	0.38	°C/W
Thermal Resistance, Junction to Case (FRD)	R _{θJC}	--	--	--	0.4	°C/W
Thermal Resistance, Junction to Ambient (IGBT)	R _{θJA}	--	--	--	40	°C/W
Soldering Temperature (in line)	T _{sold}	15 ⁺² ₋₀ sec, 1time	--	--	260	°C

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 =250μA	650	--	--	V
C-E Leakage Current	I _{CEs}	V _{CE} =650V, V _{GE} =0V	--	--	50	μA
G-E Leakage Current	I _{GES}	V _{GE} =20V, V _{CE} =0V	--	--	±100	nA
G-E Threshold Voltage	V _{GE(th)}	I _C =250μA, V _{CE} =V _{GE}	3.2	4.0	4.8	V
Collector to Emitter Saturation Voltage	V _{CE(sat)}	I _C =75A, V _{GE} =15V, T _C =25°C	--	1.42	1.85	V
		I _C =75A, V _{GE} =15V, T _C =125°C	--	1.62	--	V
		I _C =75A, V _{GE} =15V, T _C =150°C	--	1.67	--	V
Input Capacitance	C _{ies}	V _{CE} =30V	--	4823	--	pF
Output Capacitance	C _{oes}	V _{GE} =0V	--	131	--	
Reverse Transfer Capacitance	C _{res}	f=1MHz	--	21	--	
Turn-On Delay Time	T _{d(on)}	V _{CE} =400V I _C =75A R _g =10Ω V _{GE} =15V inductive load T _C =25°C	--	35	--	ns
Rise Time	T _r		--	39	--	
Turn-Off Delay Time	T _{d(off)}		--	194	--	
Fall Time	T _f		--	35	--	
Turn-On Switching Loss	E _{on}		T _C =25°C	--	1.56	--
Turn-Off Switching Loss	E _{off}	--		1.07	--	
Total Switching Loss	E _{st}	--		2.63	--	
Turn-On Delay Time	T _{d(on)}	V _{CE} =400V I _C =37.5A R _g =10Ω V _{GE} =15V inductive load T _C =25°C	--	32	--	ns
Rise Time	T _r		--	24	--	
Turn-Off Delay Time	T _{d(off)}		--	219	--	
Fall Time	T _f		--	33	--	
Turn-On Switching Loss	E _{on}		T _C =25°C	--	0.50	--
Turn-Off Switching Loss	E _{off}	--		0.55	--	
Total Switching Loss	E _{st}	--		1.05	--	
Total Gate Charge	Q _g	V _{CE} =520V, I _C =75A, V _{GE} =15V	--	184	--	nC
Gate to Emitter Charge	Q _{ge}		--	33	--	
Gate to Collector Charge	Q _{gc}		--	48	--	

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 =75A, T _C =25°C	--	1.55	1.9	V
		I _F =75A, T _C =150°C	--	1.52	--	
Diode Reverse Recovery Time	T _{rr}	I _{ES} =75A, di _{ES} /dt=200A/μs,	--	123	--	ns
Diode Reverse Recovery Charge	Q _{rr}	T _C =25°C	--	0.4	--	μC

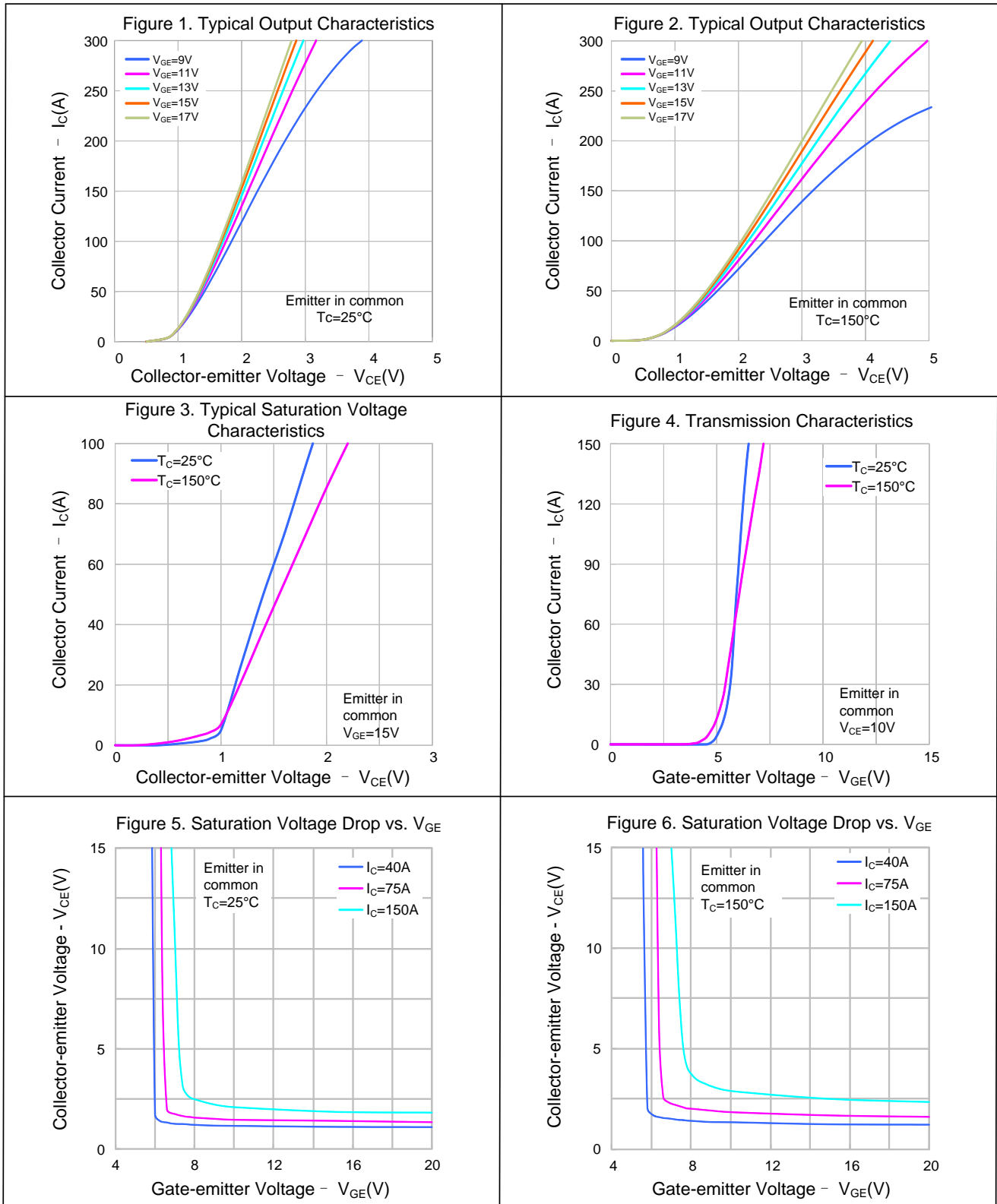
ELECTRICAL CHARACTERISTICS OF IGBT (UNLESS OTHERWISE NOTED, $T_C=150^{\circ}\text{C}$)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Turn-On Delay Time	$T_{d(on)}$	$V_{CE}=400\text{V}$ $I_C=75\text{A}$ $R_g=10\Omega$ $V_{GE}=15\text{V}$ inductive load $T_C=150^{\circ}\text{C}$	--	40	--	ns
Rise Time	T_r		--	86	--	
Turn-Off Delay Time	$T_{d(off)}$		--	272	--	
Fall Time	T_f		--	80	--	
Turn-On Switching Loss	E_{on}	inductive load $T_C=150^{\circ}\text{C}$	--	2.6	--	mJ
Turn-Off Switching Loss	E_{off}		--	2.3	--	
Total Switching Loss	E_{st}		--	4.9	--	
Turn-On Delay Time	$T_{d(on)}$	$V_{CE}=400\text{V}$ $I_C=37.5\text{A}$ $R_g=10\Omega$ $V_{GE}=15\text{V}$ inductive load $T_C=150^{\circ}\text{C}$	--	37	--	ns
Rise Time	T_r		--	62	--	
Turn-Off Delay Time	$T_{d(off)}$		--	290	--	
Fall Time	T_f		--	40	--	
Turn-On Switching Loss	E_{on}	inductive load $T_C=150^{\circ}\text{C}$	--	0.78	--	mJ
Turn-Off Switching Loss	E_{off}		--	1.08	--	
Total Switching Loss	E_{st}		--	1.86	--	

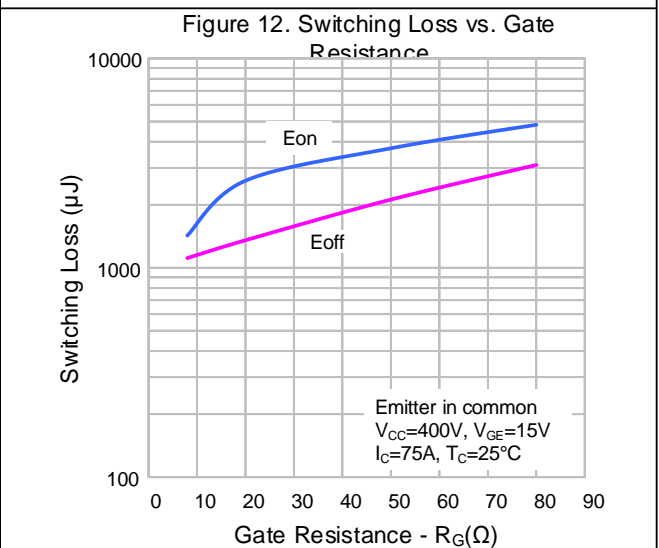
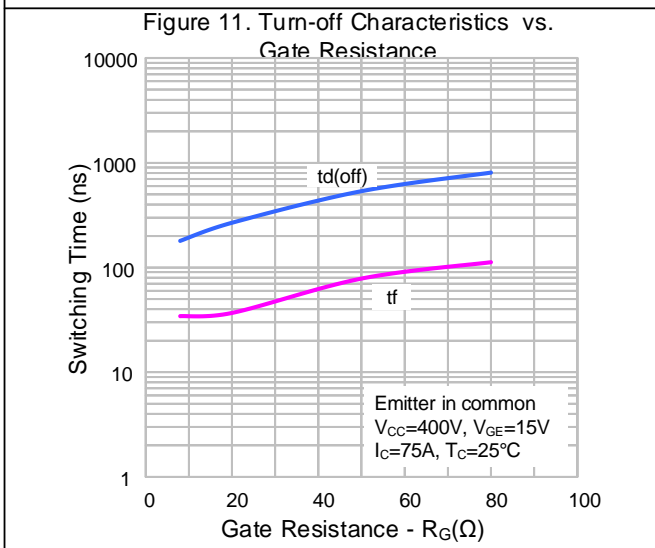
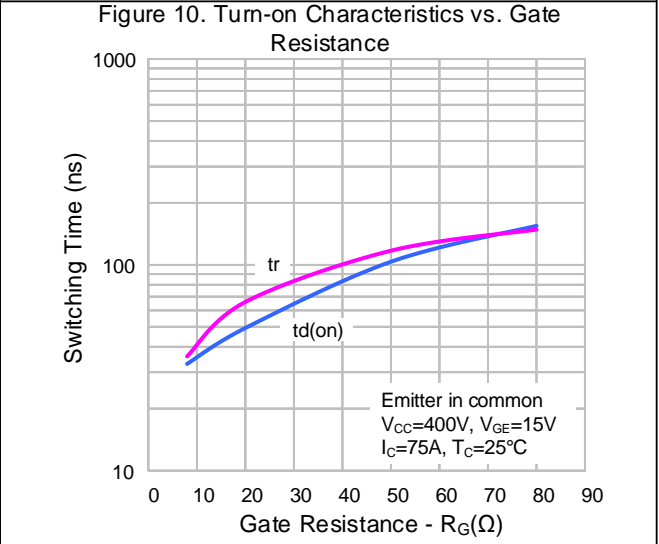
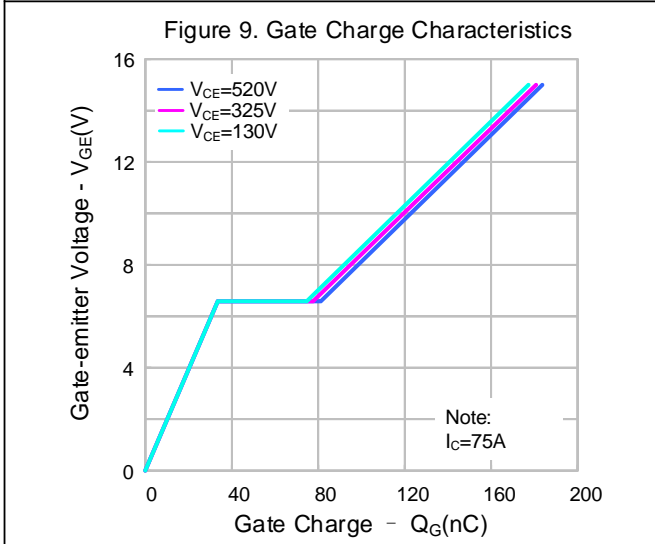
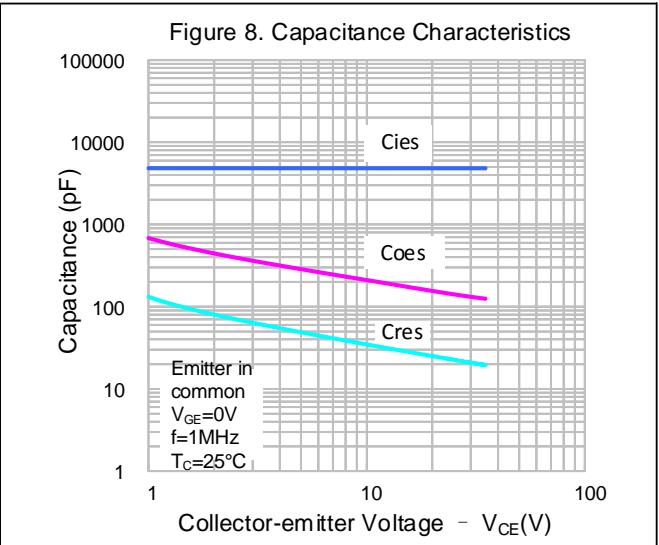
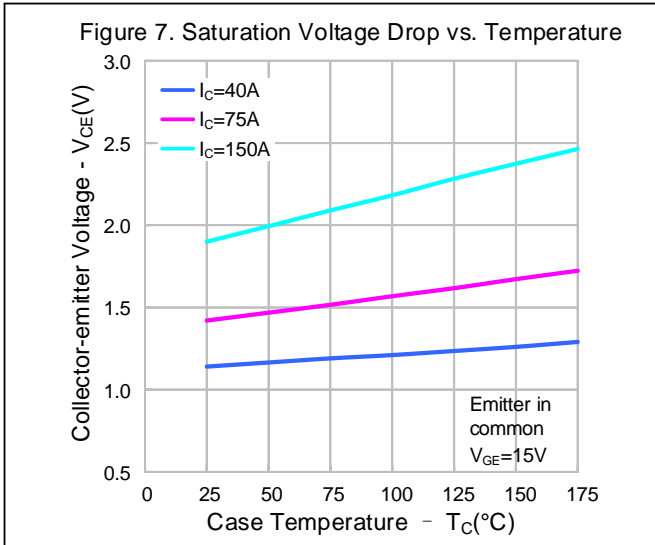
ELECTRICAL CHARACTERISTICS OF FRD (UNLESS OTHERWISE NOTED, $T_C=150^{\circ}\text{C}$)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Diode Reverse Recovery Time	T_{rr}	$I_{ES}=75\text{A}$, $dI_{ES}/dt=200\text{A}/\mu\text{s}$, $T_C=150^{\circ}\text{C}$	--	218	--	ns
Diode Reverse Recovery Charge	Q_{rr}		--	1.96	--	μC

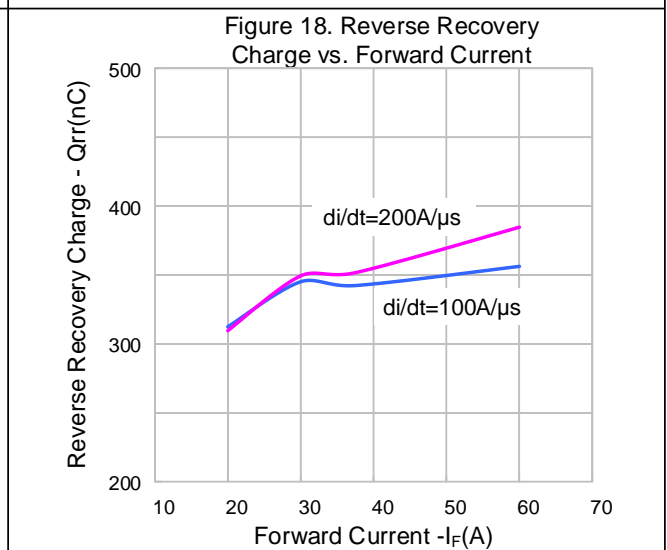
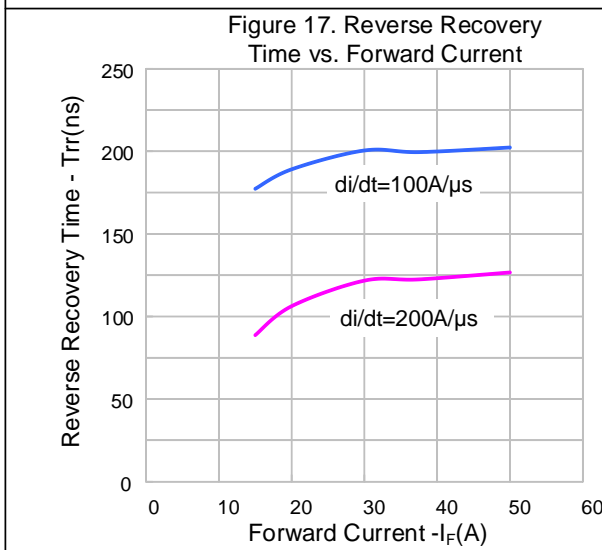
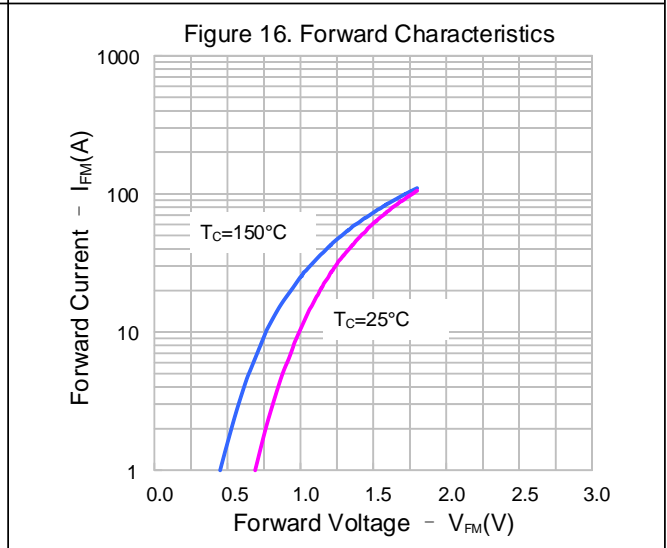
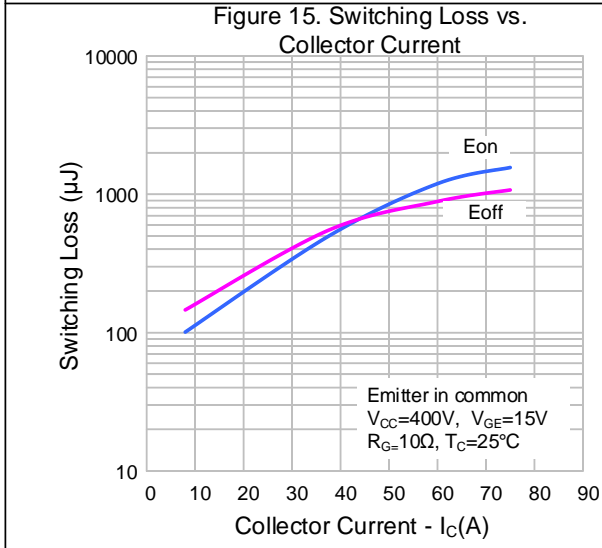
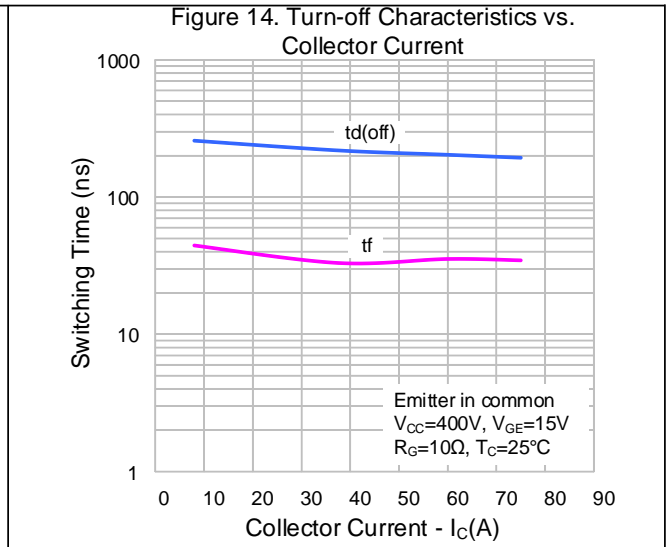
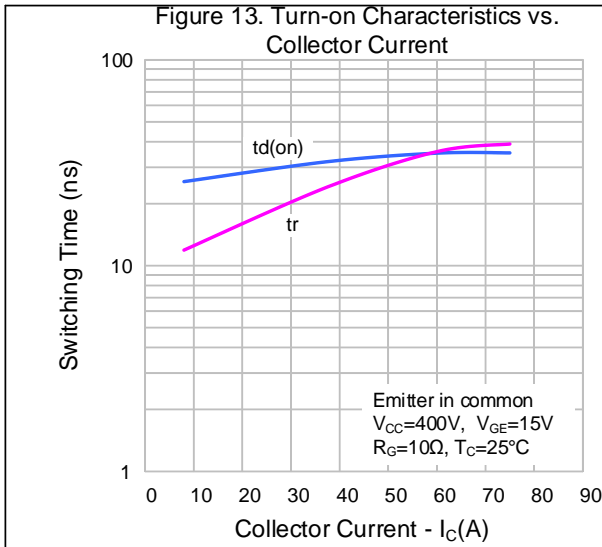
TYPICAL CHARACTERISTICS



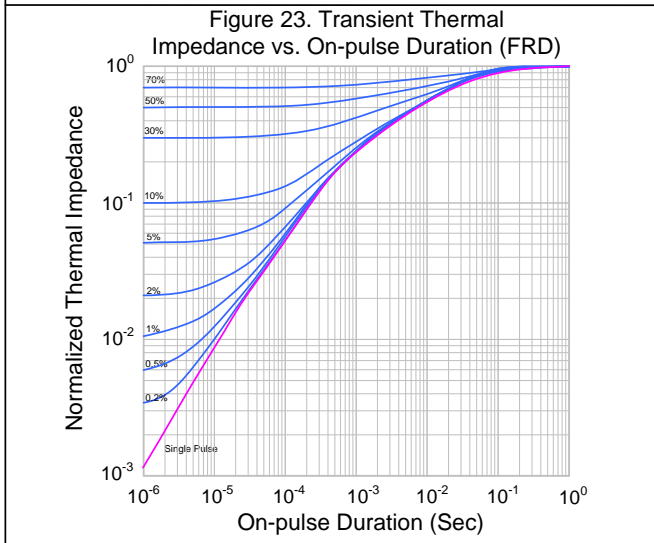
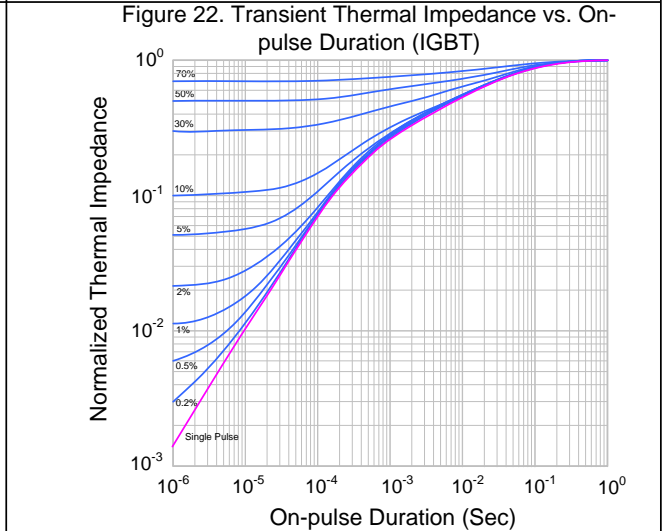
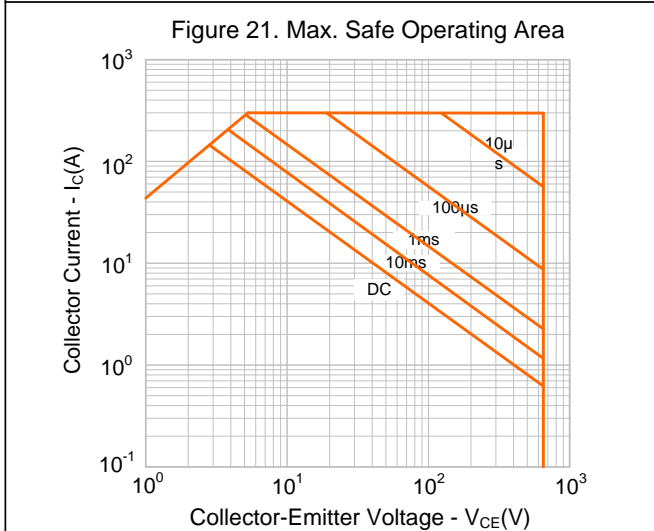
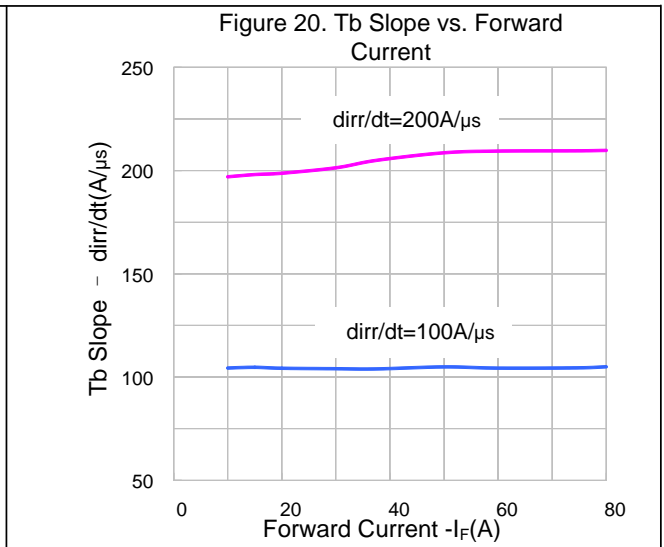
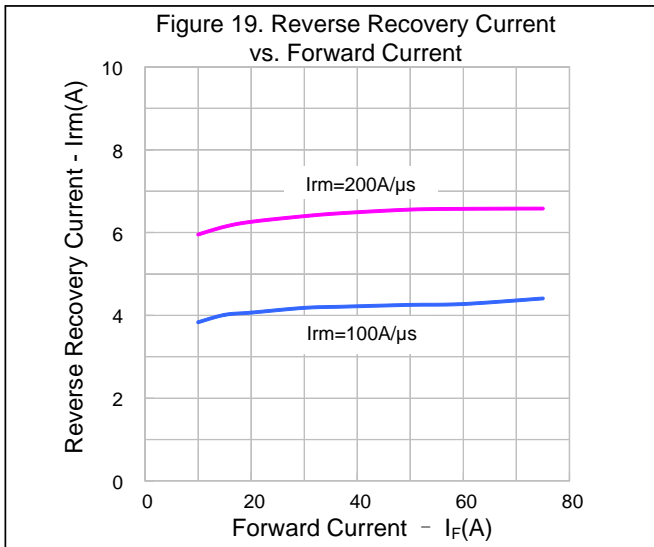
TYPICAL CHARACTERISTICS (CONTINUED)



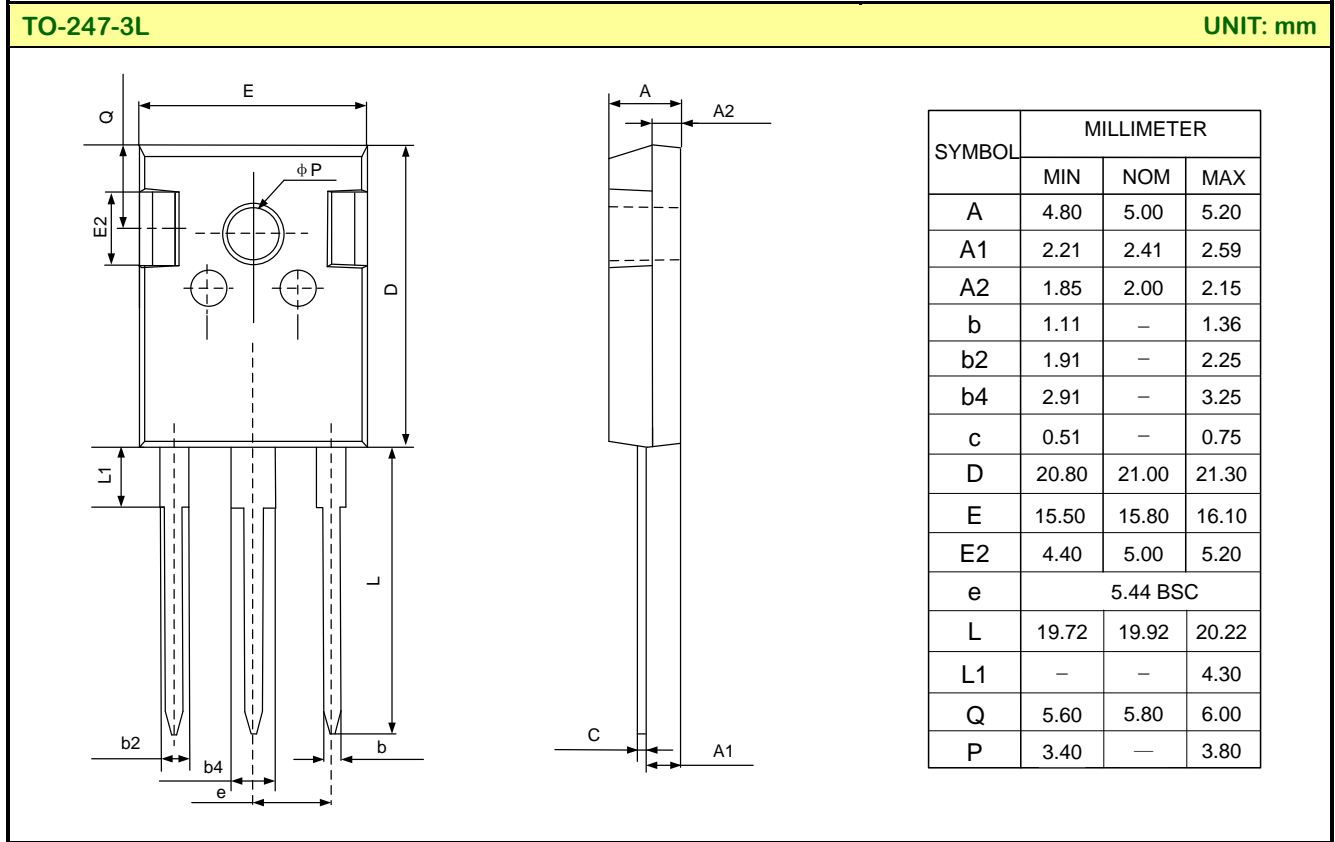
TYPICAL CHARACTERISTICS (CONTINUED)



TYPICAL CHARACTERISTICS (CONTINUED)



PACKAGE OUTLINE



MOS DEVICES OPERATE NOTES:

Electrostatic charges may exist in many things. Please take following preventive measures to prevent effectively the MOS electric circuit as a result of the damage which is caused by discharge:

- The operator must put on wrist strap which should be earthed to against electrostatic.
- Equipment cases should be earthed.
- All tools used during assembly, including soldering tools and solder baths, must be earthed.
- MOS devices should be packed in antistatic/conductive containers for transportation.

Important notice :

1. Silan reserves the right to make changes of this instruction without notice.
2. Customers should obtain the latest relevant information when purchasing and should verify whether such information is latest and complete. Please read this instruction and application manual and related materials carefully before using products, including the circuit operation precautions, etc.
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Rev.: 1.4

Revision History:

1. Update characteristics
 2. Update the important notice
-

Rev.: 1.3

Revision History:

1. Modify P_D and $R_{\theta JC}$ and update corresponding typical characteristics
 2. Update the important notice
-

Rev.: 1.2

Revision History:

1. Update $V_{CE(sat)}$ when $T_C=25^\circ C$
-

Rev.: 1.1

Revision History:

1. Add V_{GE}
-

Rev.: 1.0

Revision History:

1. First release
-