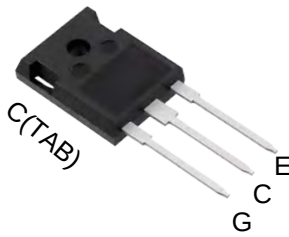


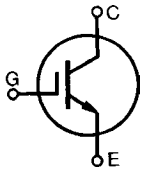
SG75T65UDB2

Discrete IGBTs

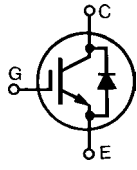
Dimensions TO-247AD



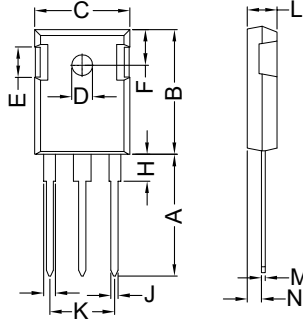
G=Gate,
C=Collector,
E=Emitter,
TAB=Collector



SG75T65UB2



SG75T65UDB2



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

MAXIMUM RATING (Ta=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V_{CES}	650	V
Gate-Emitter Voltage		V_{GES}	±20	V
Collector Current	@Tc=25°C	I_C	100	A
	@Tc=100°C		75	A
Pulsed Collector Current		I_{CM}^*	305	A
Diode Continuous Forward	@Tc=100°C	I_F	75	A
Current Diode Maximum		I_{FM}	150	A
Maximum Power Dissipation	@Tc=25	P_D	397	W
	@Tc=100		203	W
Maximum Junction Temperature		T_j	175	°C
Storage Temperature Range		T_{stg}	-55 to +150	°C

*

Repetitive rating : Pulse width limited by max. junction temperature

THERMAL CHARACTERISTIC

CHARACTERISTIC	SYMBOL	MAX.	UNIT
(IGBT) Thermal Resistance, Junction to Case	R_{thJC}	0.37	°C/W
(DIODE) Thermal Resistance, Junction to Case	R_{thJC}	0.44	°C/W
Thermal Resistance, Junction to Ambient	R_{thJA}	40	°C/W

General Description

SIRECTIFIER Trench Field Stop IGBTs offer low switching losses, high energy efficiency and short circuit ruggedness.

It is designed for applications such as motor control, uninterrupted power supplies(UPS), general inverters.

FEATURES

- High speed switching
- High ruggedness, temperature stable behavior
- Short Circuit Withstand Times 10us
- Extremely enhanced avalanche capability



Sirectifier®

SG75T65UDB2

Discrete IGBTs

ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Static							
Collector-Emitter Breakdown Voltage	BV _{CES}	V _{GE} =0V , I _C =250μA	650		-	V	
Collector Cut-off Current	I _{CES}	V _{GE} =0V, V _{CE} =650V	-	-	75	μA	
Gate Leakage Current	I _{GES}	V _{CE} =0V, V _{GE} =±20V	-	-	±100	nA	
Gate Threshold Voltage	V _{GE} (th)	V _{GE} =V _{CE} , I _C =7.5mA	5.0	6.0	7.5	V	
Collector-Emitter Saturation Voltage	V _{CE} (sat)	V _{GE} =15V, I _C =75A	-	1.65	1.80	V	
		V _{GE} =15V, I _C =150A	-	2.20	-	V	
		V _{GE} =15V, I _C =75A, T _C = 125°C	-	1.90	-	V	
Dynamic							
Total Gate Charge	Q _g	V _{CC} =520V, V _{GE} =15V, I _C = 75A	-	155	-	nC	
ChargeGate-Emitter Charge	Q _{ge}		-	50	-	nC	
Gate-Collector Charge	Q _{gc}		-	140	-	nC	
Turn-On Delay Time	t _d (on)	V _{CC} =300V, I _C =75A, V _{GE} =15V, R _G =10Ω Inductive Load, T _C = 25°C (Note 1)	-	30	-	ns	
Rise Time	t _r		-	35	-	ns	
Turn-Off Delay Time	t _d (off)		-	175	-	ns	
Fall Time	t _f		-	42	-	ns	
Turn-On Switching Loss	E _{on}		-	2.3	-	mJ	
Turn-Off Switching Loss	E _{off}		-	0.9	-	mJ	
Total Switching Loss	E _{ts}		-	3.2	-	mJ	
Turn-On Delay Time	t _d (on)		V _{CC} =300V, I _C =75A, V _{GE} =15V, R _G =10Ω Inductive Load, T _C = 125°C (Note 1)	-	32	-	ns
Rise Time	t _r			-	36	-	ns
Turn-Off Delay Time	t _d (off)	-		195	-	ns	
Fall Time	t _f	-		40	-	ns	
Turn-On Switching Loss	E _{on}	-		3.00	-	mJ	
Turn-Off Switching Loss	E _{off}	-		1.05	-	mJ	
Total Switching Loss	E _{ts}	-		4.05	-	mJ	
Input Capacitance	C _{ies}	V _{CE} =30V, V _{GE} =0V, f=1MHz	-	4240	-	pF	
CapacitanceOuput Capacitance	C _{oes}		-	140	-	pF	
Reverse Transfer Capacitance	C _{res}		-	18	-	pF	
Short Circuit Withstand Time	t _{sc}	V _{CC} =300V, V _{GE} =15V, T _C =100°C	10	-	-	μs	

Note 1 : Energy loss include tail current and diode reverse recovery.

SG75T65UDB2

Discrete IGBTs

ELECTRICAL CHARACTERISTIC OF DIODE

CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Diode Forward Voltage	V _F	I _F = 75A	T _C =25°C	-	1.35	1.70	V
			T _C =125°C				
Diode Reverse Recovery Time	t _{rr}	V _{CC} =300V, I _F =75A di/dt = 600A/μs	T _C =25°C	-	90	-	ns
			T _C =125°C	-	130	-	
Diode Peak Reverse Recovery Current	I _{rr}		T _C =25°C	-	25	-	A
			T _C =125°C	-	38	-	
Diode Reverse Recovery Charge	Q _{rr}		T _C =25°C	-	1.0	-	μC
			T _C =125°C	-	3.8	-	

Fig 1. Forward Characteristics

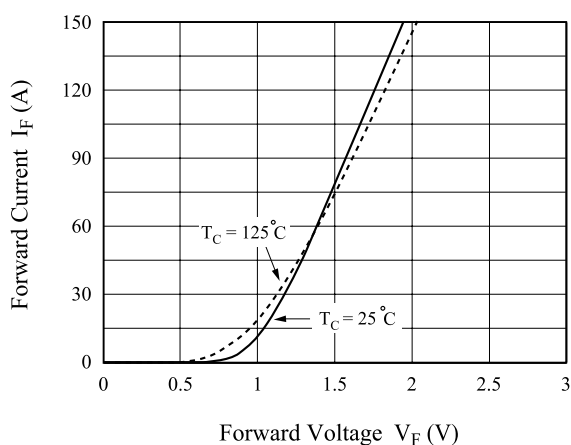


Fig 2. Reverse Recovery Current

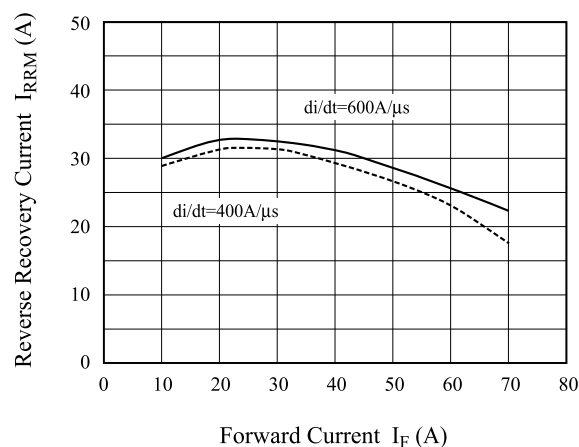
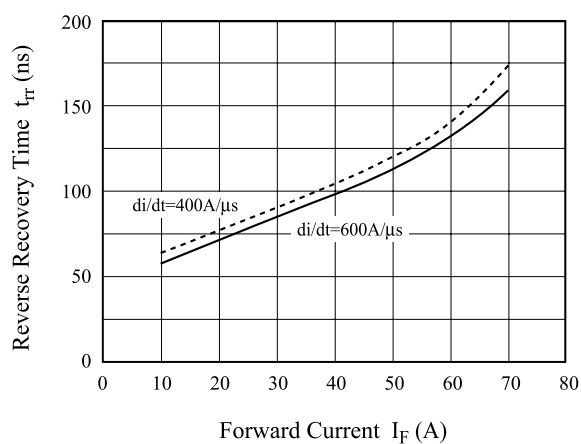


Fig 3. Reverse Recovery Time



SG75T65UDB2

Discrete IGBTs

Fig 4. Saturation Voltage Characteristics

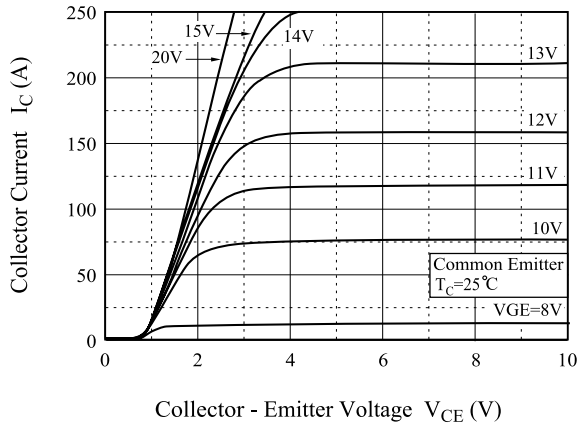


Fig 5. Saturation Voltage Characteristics

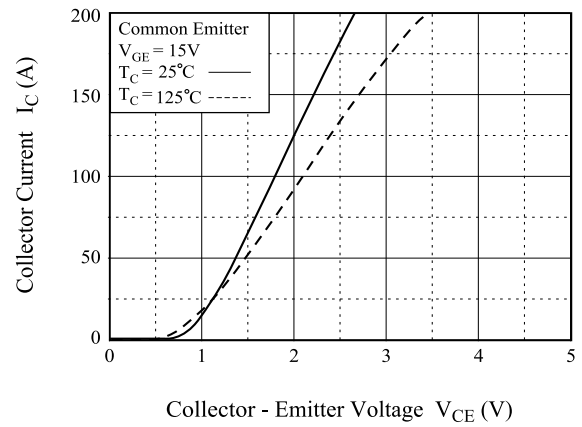


Fig 6. Saturation Voltage vs. Case Temperature

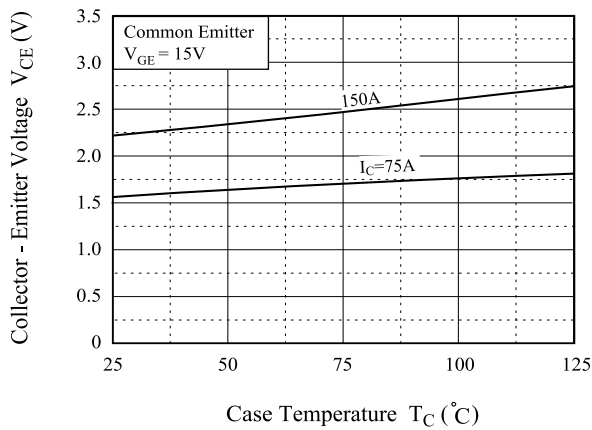


Fig 7. Saturation Voltage vs. V_{GE}

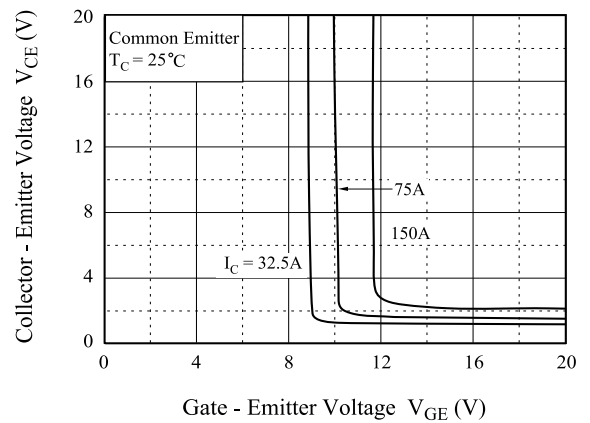


Fig 8. Saturation Voltage vs. V_{GE}

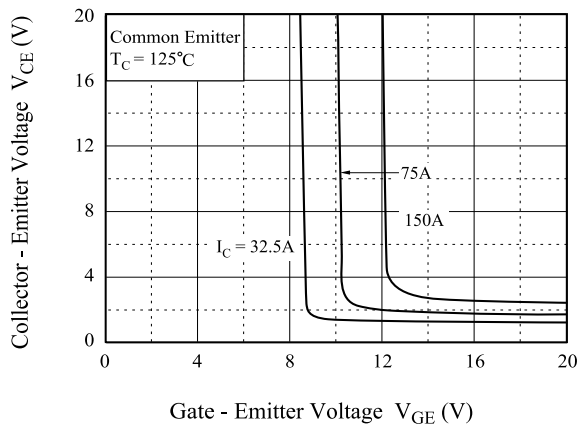
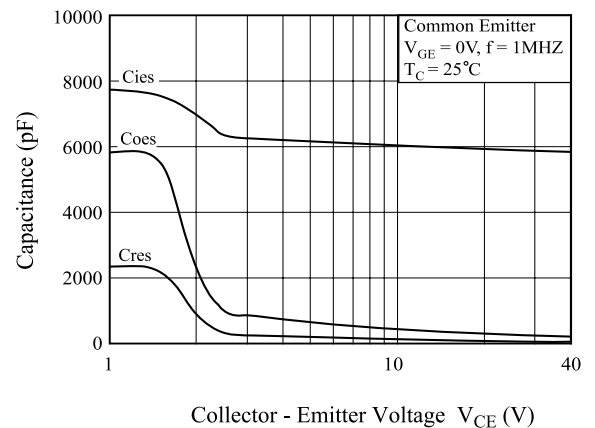


Fig 9. Capacitance Characteristics



SG75T65UDB2

Discrete IGBTs

Fig 10. Turn-On Characteristics vs. Gate Resistance

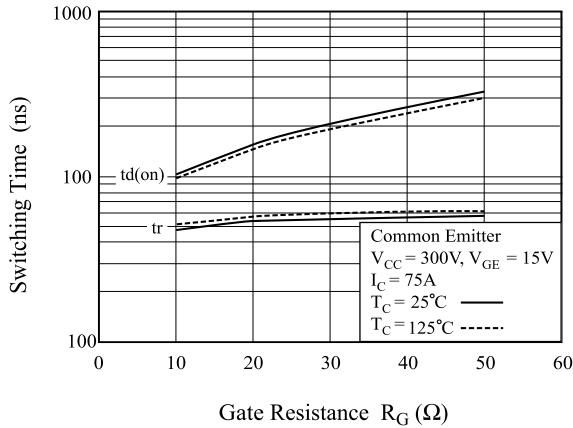


Fig 11. Turn-Off Characteristics vs. Gate Resistance

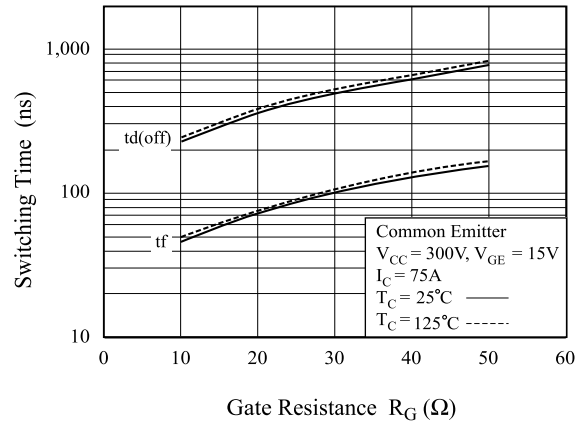


Fig 12. Switching Loss vs. Gate Resistance

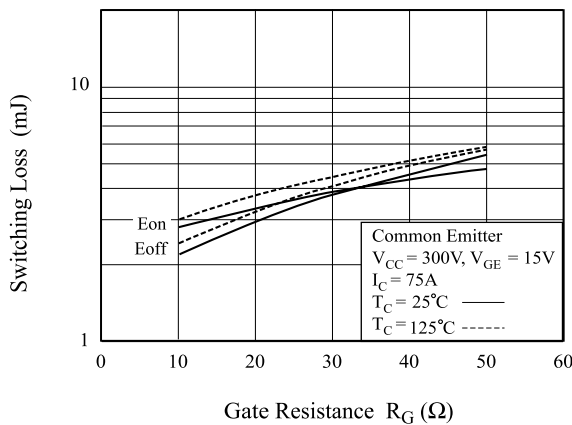


Fig 13. Turn-On Characteristics vs. Collector Current

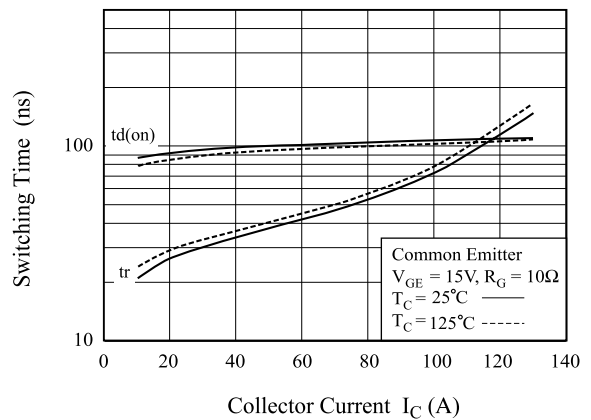


Fig 14. Turn-Off Characteristics vs. Collector Current

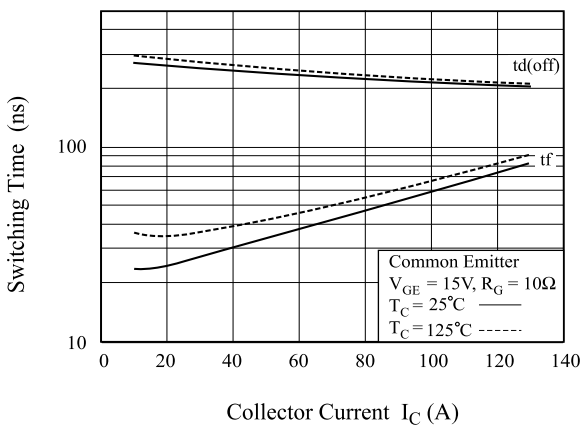
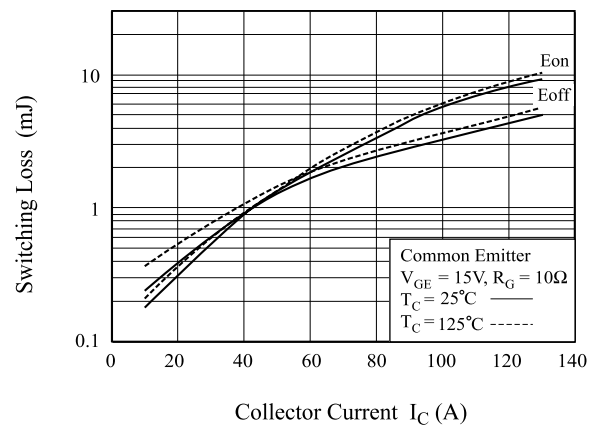


Fig 15. Switching Loss vs. Collector Current



SG75T65UDB2

Discrete IGBTs

Fig 16. Gate Charge Characteristics

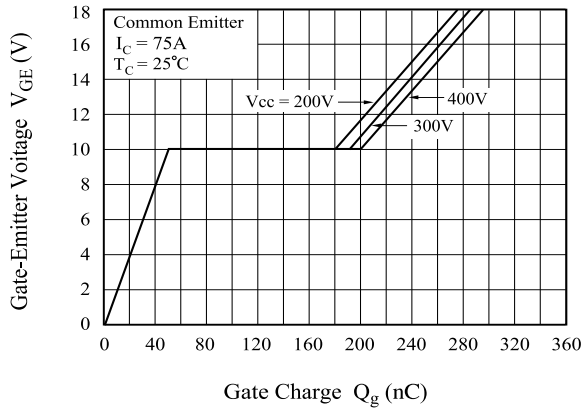


Fig 17. SOA Characteristics

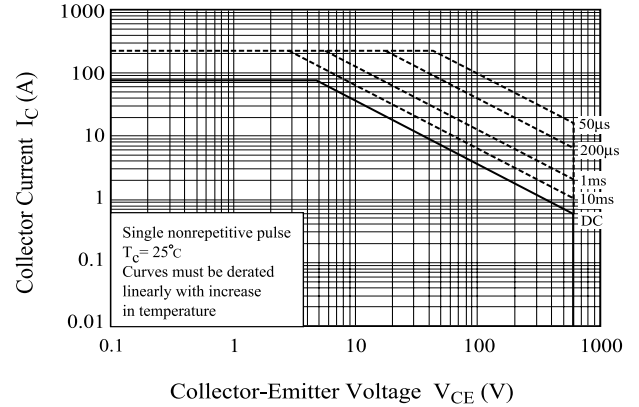


Fig 18. Turn-Off SOA

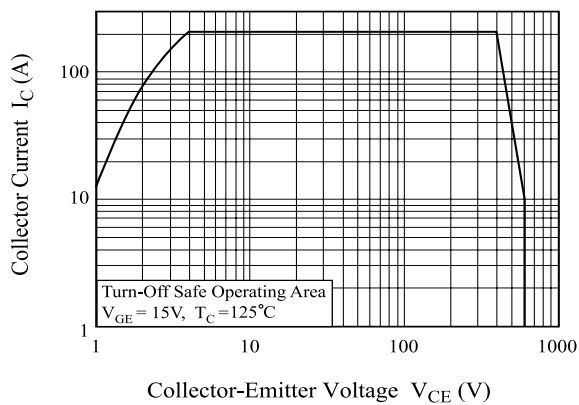
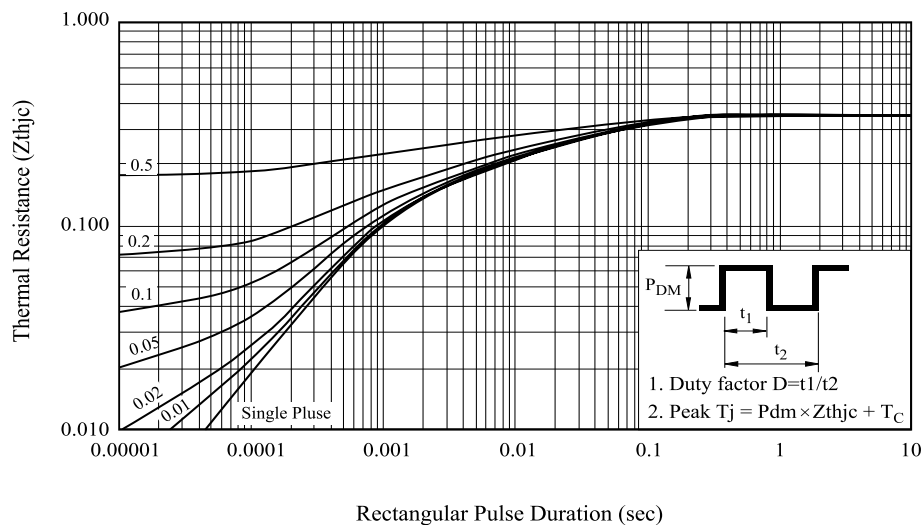


Fig 19. Transient Thermal Impedance of IGBT



SG75T65UDB2

Discrete IGBTs

Fig.20 Switching Test Circuit

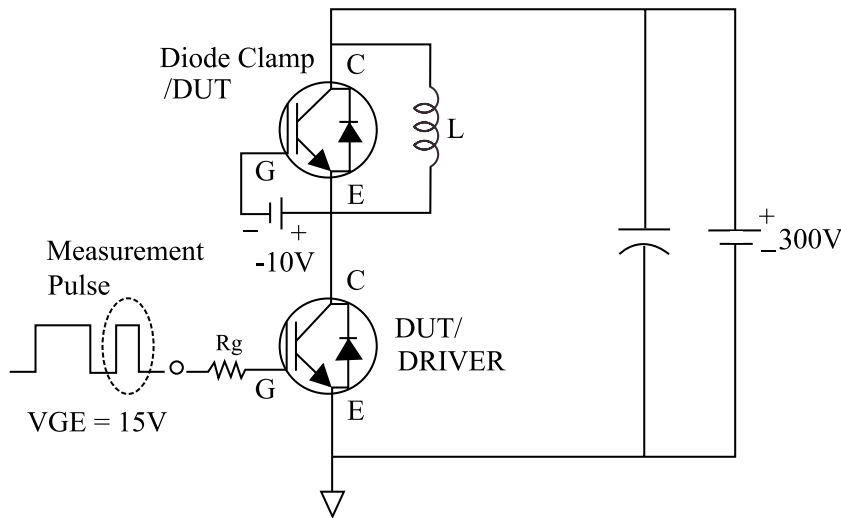


Fig.21 Definition Switching Time & Loss

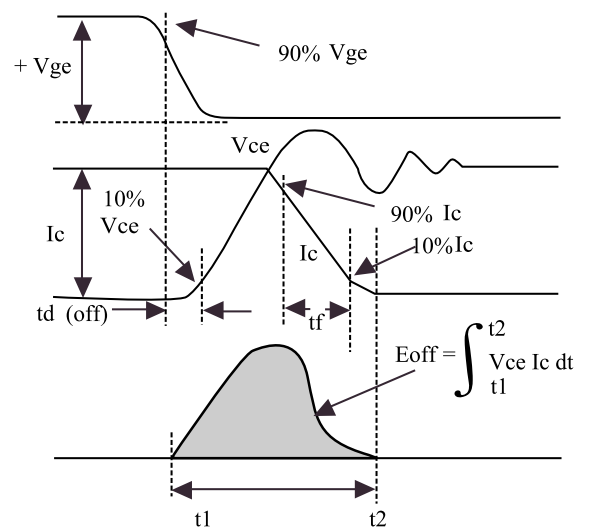
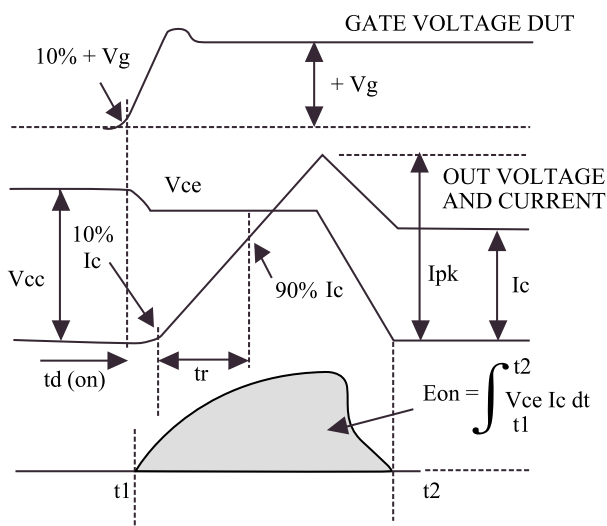
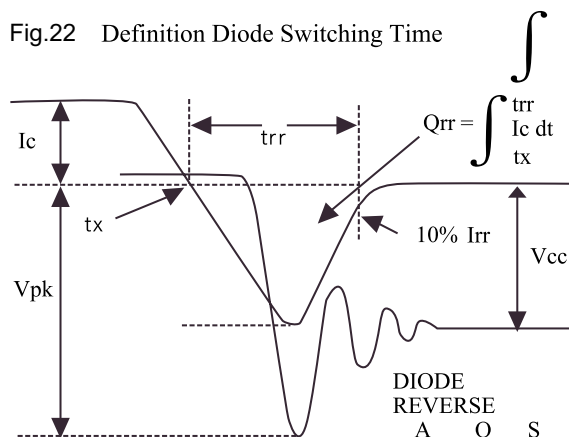


Fig.22 Definition Diode Switching Time



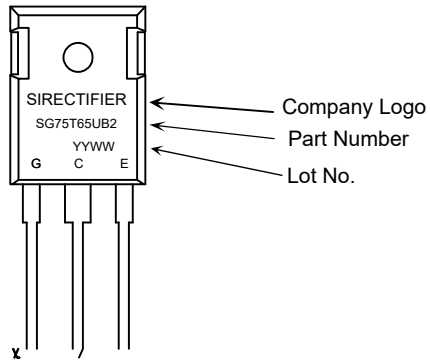
SG75T65UDB2

Discrete IGBTs

Marking

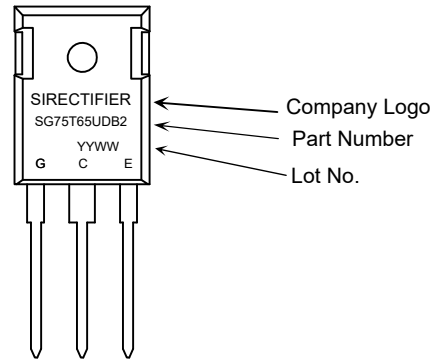
SG75T65UB2

(TO-247AD)



SG75T65UDB2

(TO-247AD)



Ordering Information

Part Number	Package	Shipping	Marking Code
SG75T65UB2	TO-247AD	30pcs / Tube	SG75T65UB2
SG75T65UDB2	TO-247AD	30pcs / Tube	SG75T65UDB2