

GM100HB12BTA

ELECTRICAL CHARACTERISTICS (Ta=25)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Static							
Collector-Emitter Breakdown Voltage	BV_{CES}	$V_{GE}=0V, I_C=1mA$	1200	-	-	V	
Collector Cut-off Current	I_{CES}	$V_{GE}=0V, V_{CE}=1200V$	-	-	1.0	mA	
Gate Leakage Current	I_{GES}	$V_{CE}=0V, V_{GE}= \pm 20V$	-	-	± 100	nA	
Gate Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=1mA$	-	5.8	-	V	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=100A$	-	2.1	2.5	V	
		$V_{GE}=15V, I_C=100A, T_C = 125$	-	2.2	-	V	
		$V_{GE}=15V, I_C=200A$	-	2.7	-	V	
Dynamic							
Total Gate Charge	Q_g	$V_{CE}=600V, V_{GE}= \pm 15V, I_C= 100A$	-	664	-	nC	
Gate-Emitter Charge	Q_{ge}		-	123	-	nC	
Gate-Collector Charge	Q_{gc}		-	351	-	nC	
Turn-On Delay Time	$t_{d(on)}$	$V_{CE}=600V, I_C=100A, V_{GE}= \pm 15V, R_G=10$ Inductive Load, $T_C = 25$	-	331	-	ns	
Rise Time	t_r		-	163	-	ns	
Turn-Off Delay Time	$t_{d(off)}$		-	581	-	ns	
Fall Time	t_f		-	155	-	ns	
Turn-On Switching Loss	E_{on}		-	13.3	-	mJ	
Turn-Off Switching Loss	E_{off}		-	10.4	-	mJ	
Total Switching Loss	E_{ts}		-	23.7	-	mJ	
Turn-On Delay Time	$t_{d(on)}$		$V_{CE}=600V, I_C=100A, V_{GE}= \pm 15V, R_G=10$ Inductive Load, $T_C = 125$	-	330	-	ns
Rise Time	t_r			-	169	-	ns
Turn-Off Delay Time	$t_{d(off)}$			-	624	-	ns
Fall Time	t_f	-		152	-	ns	
Turn-On Switching Loss	E_{on}	-		13.8	-	mJ	
Turn-Off Switching Loss	E_{off}	-		11.3	-	mJ	
Total Switching Loss	E_{ts}	-		25.1	-	mJ	
Input Capacitance	C_{ies}	$V_{CE}=30V, V_{GE}=0V, f=1MHz$	-	15148	-	pF	
Output Capacitance	C_{oes}		-	616	-	pF	
Reverse Transfer Capacitance	C_{res}		-	179	-	pF	
Short Circuit Current	I_{SC}	$V_{CC}=600V, V_{GE}= \pm 15V,$ $t_{psc} 10\mu s$	-	540	-	A	

THERMAL CHARACTERISTIC

CHARACTERISTIC	SYMBOL	Max	UNIT
Junction to Case (IGBT Part, Per 1/2 Module)	$R_{th(j-c)}$	0.3	/W
Junction to Case (Diode Part, Per 1/2 Module)	$R_{th(j-c)}$	0.49	

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ELECTRICAL CHARACTERISTIC OF DIODE

CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Diode Forward Voltage	V_F	$I_F = 100A$	$T_C=25$	-	2.2	2.6	V
			$T_C=125$	-	2.3	-	
Diode Reverse Recovery Time	t_{rr}		$T_C=25$	-	174	209	ns
			$T_C=125$	-	218	-	
Diode Peak Reverse Recovery Current	I_{rr}	$I_F=100A,$ $R_G=10$	$T_C=25$	-	59	71	A
			$T_C=125$	-	74	-	
Diode Reverse Recovery Charge	Q_{rr}		$T_C=25$	-	5.77	6.92	nC
			$T_C=125$	-	9.2	-	

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Fig 1. Saturation Voltage Characteristics

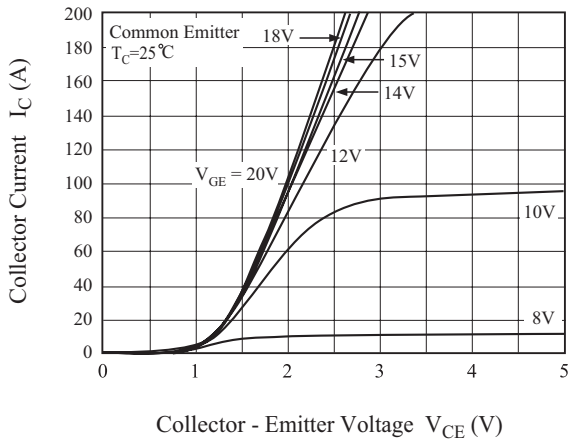


Fig 2. Saturation Voltage Characteristics

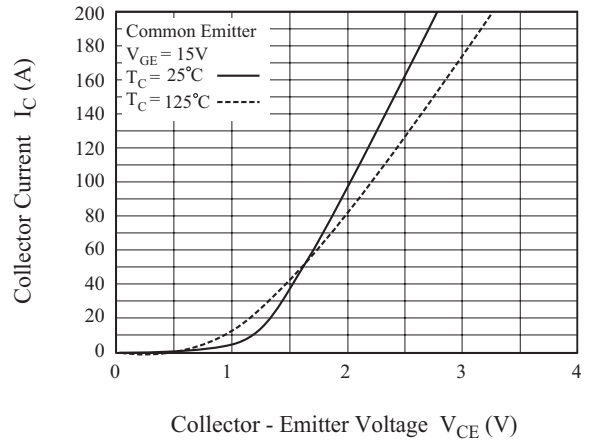


Fig 3. Saturation Voltage vs. Case Temperature

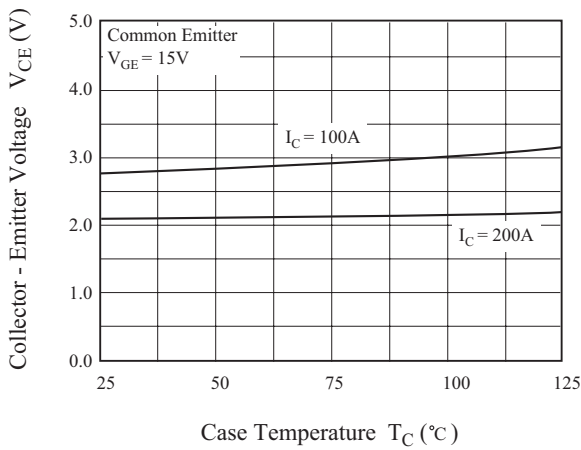


Fig 4. Saturation Voltage vs. V_{GE}

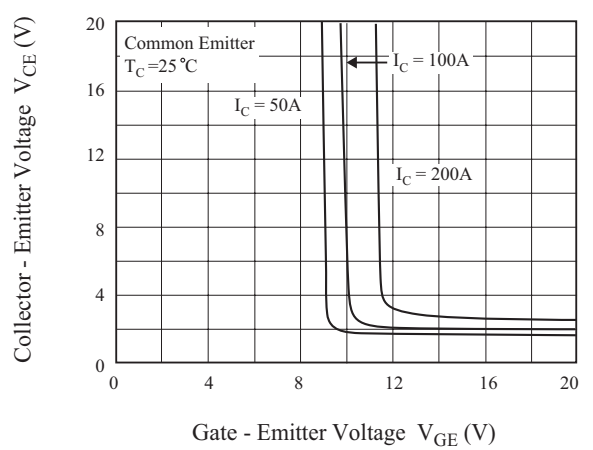


Fig 5. Saturation Voltage vs. V_{GE}

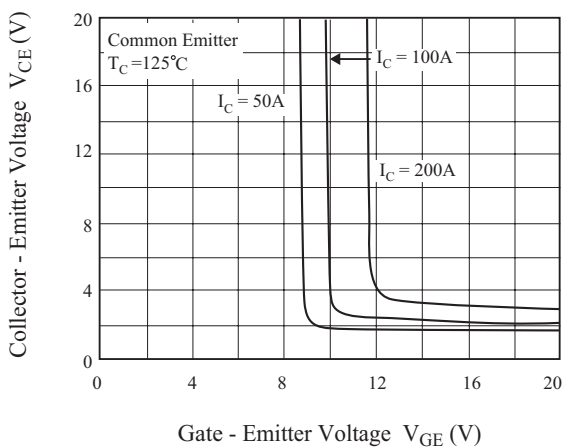
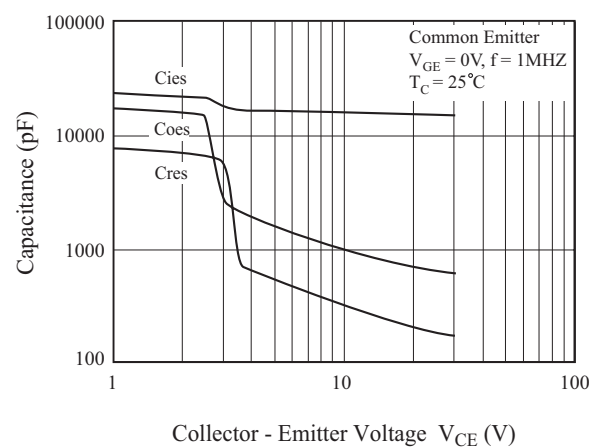


Fig 6. Capacitance Characteristics



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Fig 7. Turn-On Characteristics vs. Gate Resistance

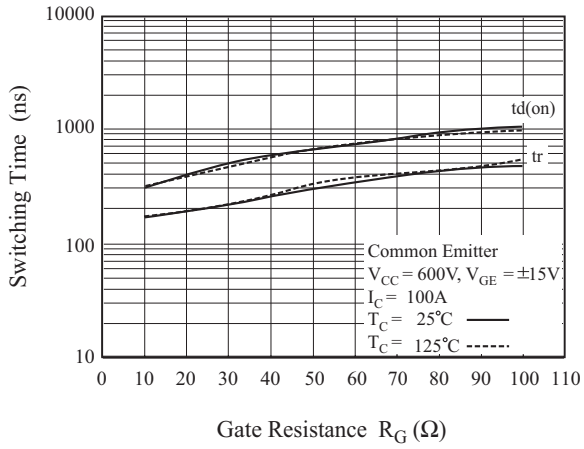


Fig 8. Turn-Off Characteristics vs. Gate Resistance

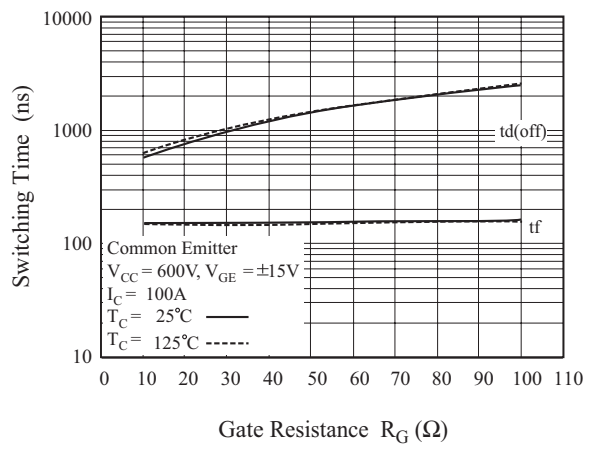


Fig 9. Switching Loss vs. Gate Resistance

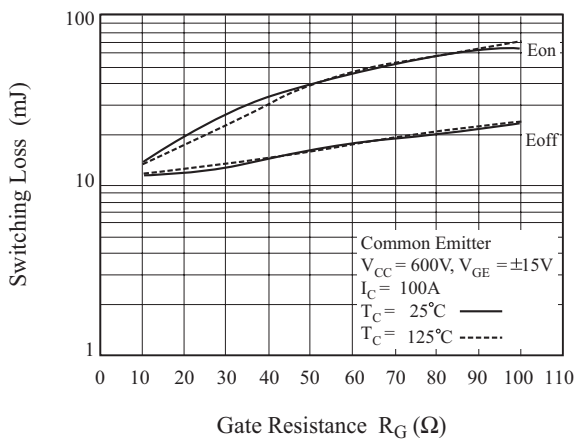


Fig 10. Turn-On Characteristics vs. Collector Current

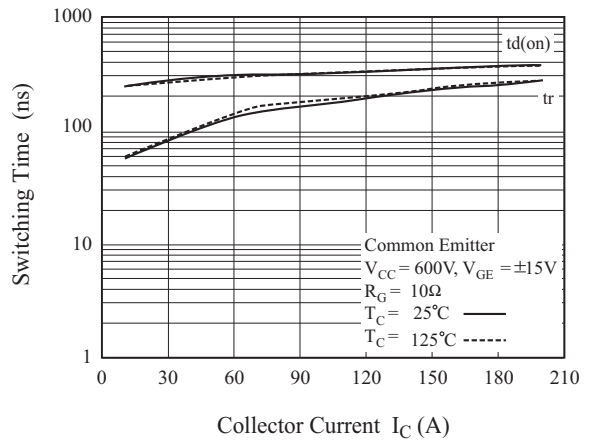


Fig 11. Turn-Off Characteristics vs. Collector Current

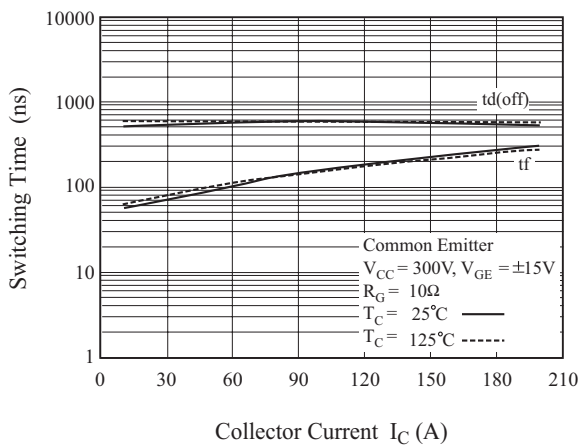
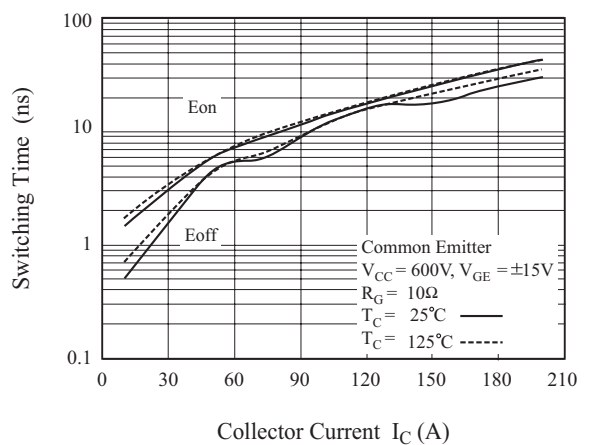


Fig 12. Turn-Off Characteristics vs. Collector Current



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Fig 13. Gate Charge Characteristics

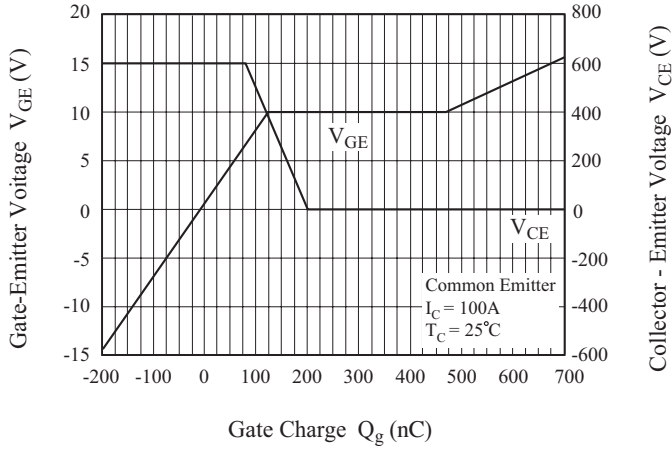


Fig 14. Reverse Bias Safe Operating Area (Max)

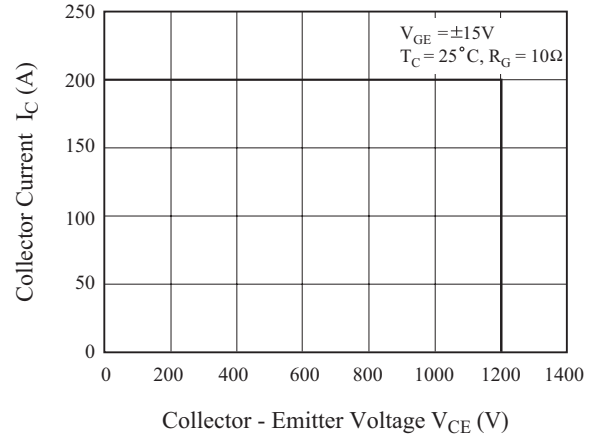
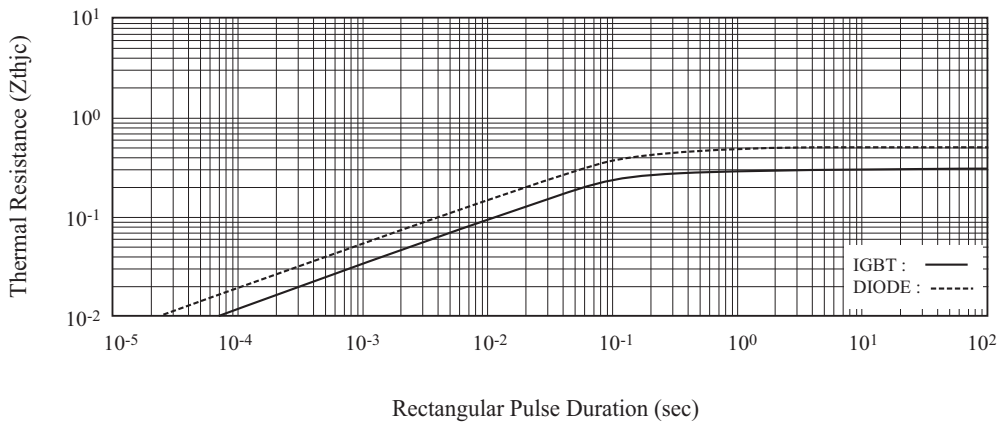


Fig15. Transient Thermal Response Curve



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Fig 16. Forward Characteristics

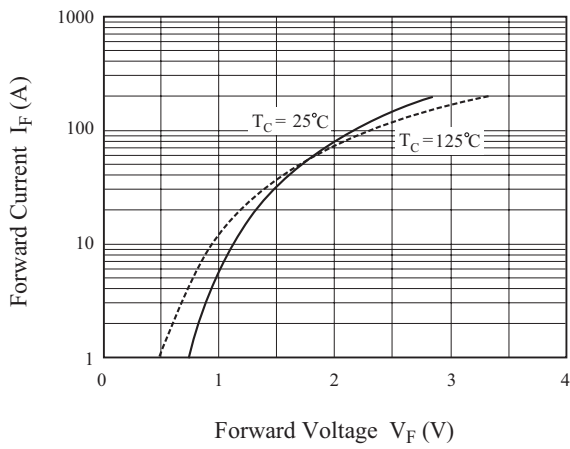


Fig 17. Reverse Recovery Current

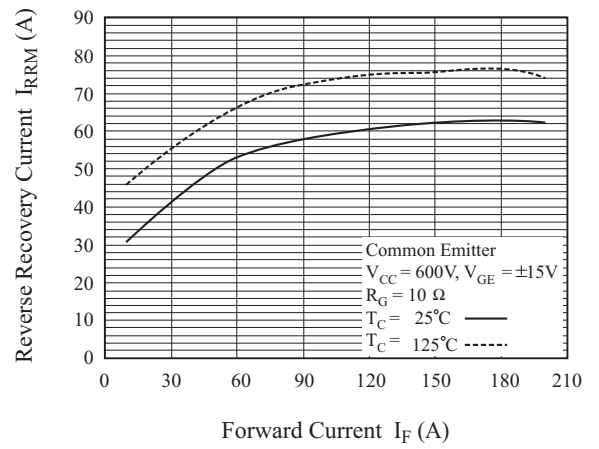
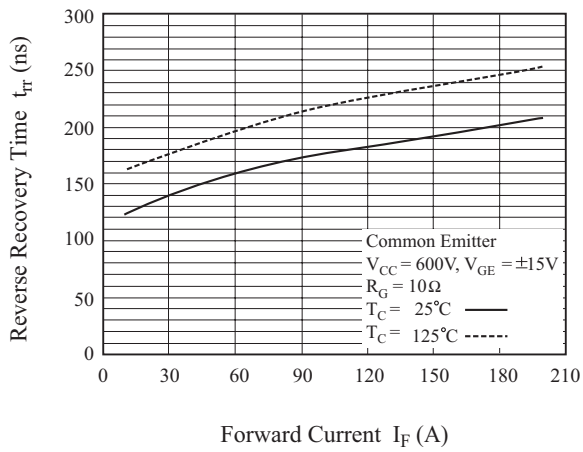


Fig 18. Reverse Recovery Current



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Fig 19. Switching Test Circuit

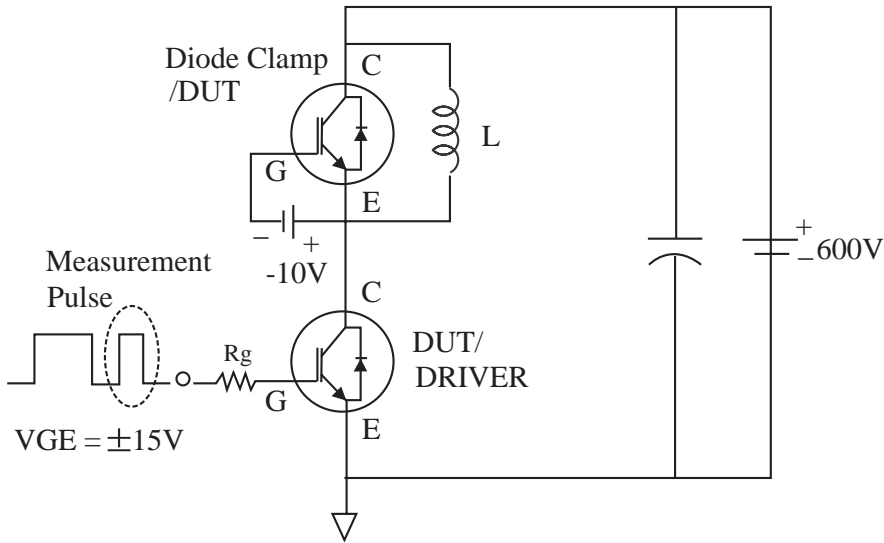


Fig 20. Definition Switching Time & Loss

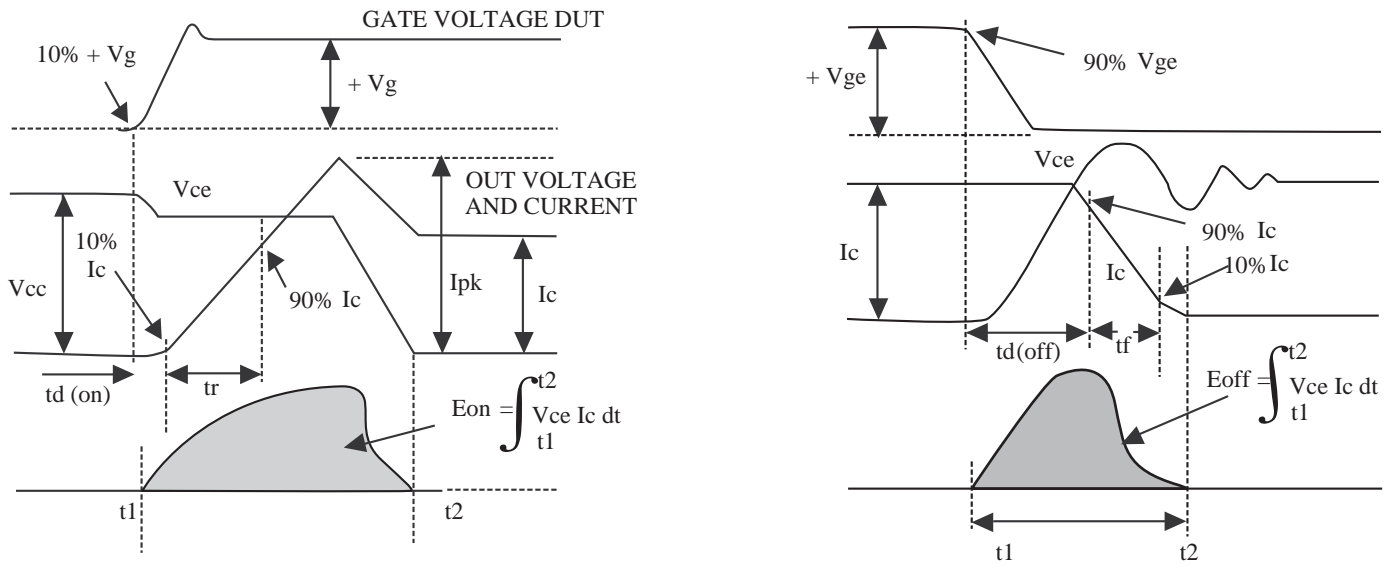


Fig 21. Definition Diode Switching Time

