IGBT Discretes

V_{CES} = 1200V ,I_C = 25A, $V_{CE(sat)}$ = 2.4V

Features:

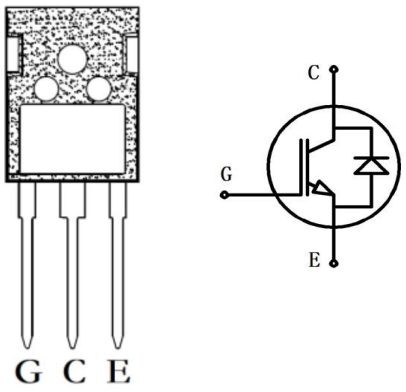
•Trench and Field-stop technology

•Low collector to emitter saturation voltage

•Optimized for Fast Switching

•Easy parallel switching capability

•Short circuit withstands time - 10μs



Applications:

•Uninterruptible Power Supply

•Induction Heating

•Electric welding machine

•Soft switching application

Absolute Maximum Ratings (T_J = 25°C unless otherwise noted)

Symbol	Parameter	Conditions	Value	Unit
V_{CES}	Collector to Emitter Voltage		1200	V
V_{GES}	Continuous Gate to Emitter Voltage		±20	V
I_C	Continuous Collector Current	T_C = 100°C	25	A
		T_C = 25°C	50	A
I_{CM}	Pulse Collector Current	t_p=1ms	50	A
P_D	Maximum Power Dissipation (IGBT)	T_C = 25°C, T_{Jmax} = 175°C	536	W
t_{sc}	Short Circuit Withstand Time	V_{CC} = 600V, V_{GE}≤15V	10	us

Absolute Maximum Ratings (T_J = 25°C unless otherwise noted)

VRRM	Repetitive peak reverse voltage		1200	V
I_F	Diode Continuous Forward Current	T_C = 100°C	25	A
I_{FM}	Peak FWD Current Repetitive	t_p=1ms	50	A

Electrical Characteristics of IGBT (T_J = 25℃)

Static characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	I_C = 1mA, V_{CE} = V_{GE} , T_J = 25℃		5.0	6.0	7.0	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 25A, V_{GE} = 15V	T_J = 25℃	-	2.4	-	V
			T_J= 125℃	-	2.7	-	
I_{CES}	Collector-Emitter Leakage Current	V_{GE} = 0V, V_{CE} = V_{CES}, T_J = 25℃		-	-	1.0	mA
I_{GES}	Gate-Emitter Leakage Current	V_{GE} = ±20V, V_{CE} = 0V, T_J = 25℃		-100	-	100	nA
C_{iss}	Input capacitance	V_{CE}=25V, V_{GE}=0V , f=1MHz		-	2497	-	nF
C_{oss}	Output capacitance			-	126	-	
C_{rss}	Reverse transfer capacitance			-	65	-	

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V, I_C=25A, V_{GE}=±15V, L=525uH, R_g=10Ω	T_J = 25℃		24		ns
			T_J = 125℃		22		
t_r	Rise Time		T_J = 25℃		27		ns
			T_J = 125℃		28		
$t_{d(off)}$	Turn-off Delay Time		T_J = 25℃		99		ns
			T_J = 125℃		245		
t_f	Fall Time		T_J = 25℃		186		ns
			T_J = 125℃		278		
E_{on}	Turn-on Switching Loss		T_J = 25℃		2.0		mJ
			T_J = 125℃		2.9		
E_{off}	Turn-off Switching Loss		T_J = 25℃		0.8		mJ
			T_J = 125℃		1.1		
$R_{\theta JC}$	Junction-To-Case (IGBT)					0.28	K/W

Electrical Characteristics of Diode (T_J = 25℃)

Static characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{FM}	Forward Voltage	I_F=25A,V_{GE}=0V	T_J = 25℃		2.1		V
			T_J = 125℃		1.9		

Switching Characteristics

I_{rr}	Peak Reverse Recovery Current	I_F=25A, V_{CC}=600V, V_{GE}=-15V， L=525uH,	T_J = 25℃		25		A
			T_J = 125℃		36		
Q_{rr}	Reverse Recovery Charge		T_J = 25℃		1.5		μC
			T_J = 125℃		3.5		

E_{rec}	Reverse Recovery Energy	R_g=10Ω	T_J = 25℃		0.4		mJ
			T_J = 125℃		0.9		
$R_{\theta JC}$	Junction-To-Case (Diode)					0.57	K/W

Module Characteristics

T_J	Maximum Junction Temperature			175	℃
T_{JOP}	Maximum Operating Junction Temperature Range	-40		+150	℃
T_{stg}	Storage Temperature	-40		+150	℃

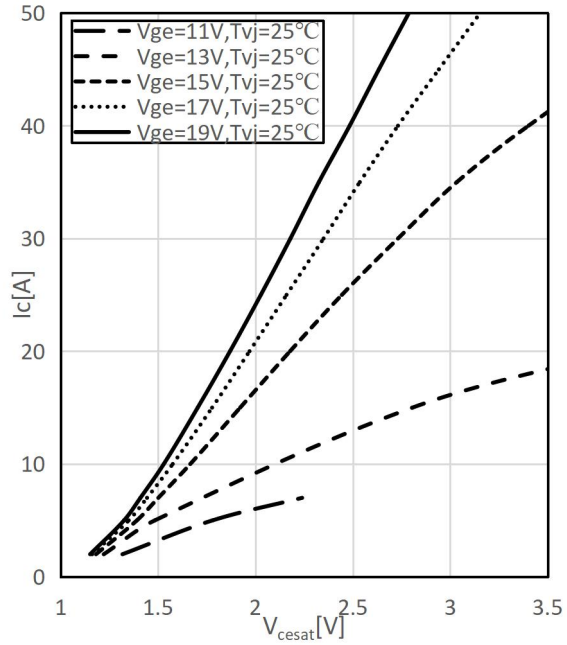


Fig.1 output characteristic IGBT Inverter (typical)

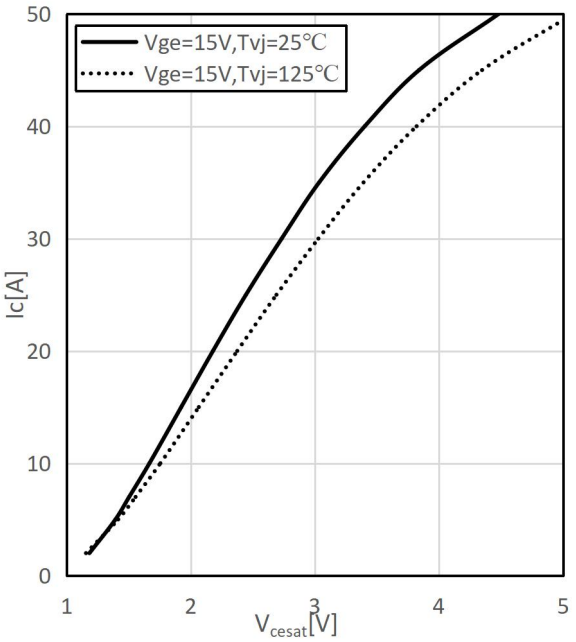


Fig.2 output characteristic IGBT Inverter (typical)

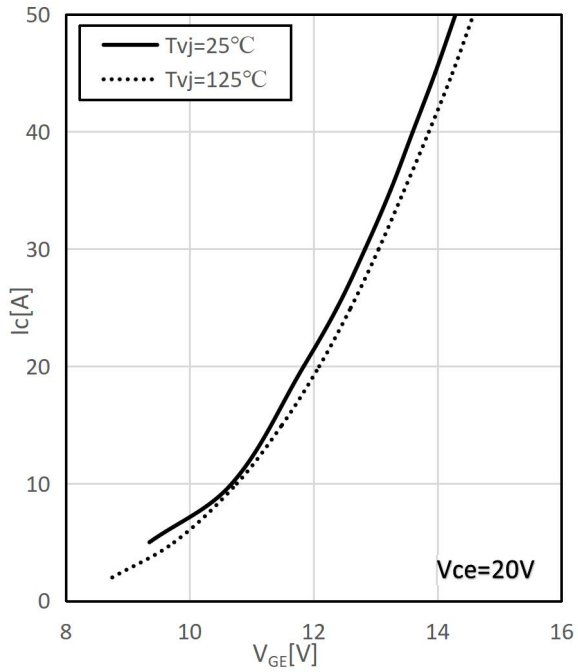


Fig.3 transfer characteristic IGBT inverter (typical)

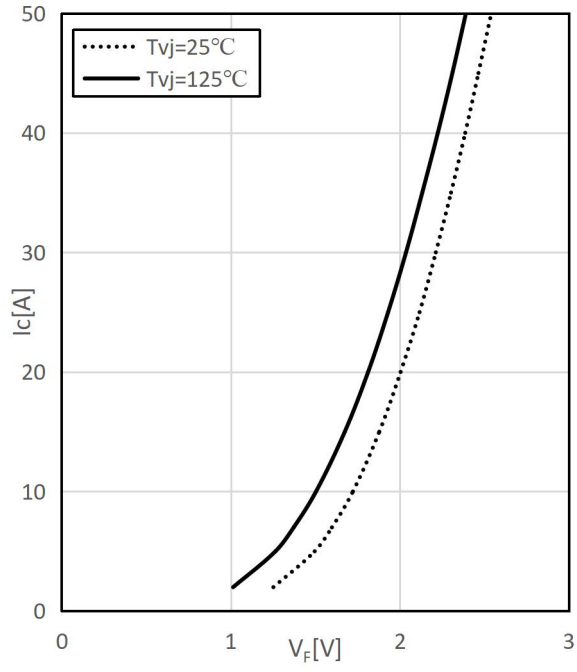


Fig.4 forward characteristic of Diode, inverter (typical)

V_{CC}=600V，V_{CE}=±15V
R_G=10Ω

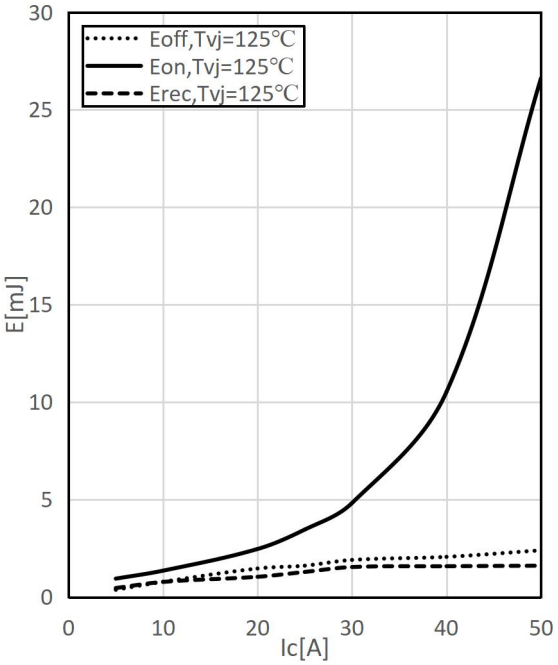


Fig.5 switching losses IGBT inverter (typical)

V_{CC}=600V，V_{CE}=±15V
I_C=25A

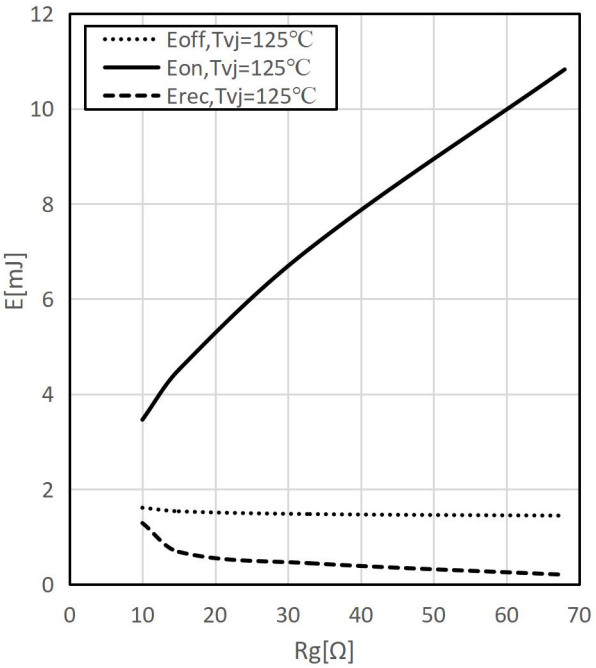


Fig.6 switching losses vs. gate resistance (Typical)

Package Outline (Unit: mm):