Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CES}	1200	V
Gate-Emitter Voltage			

Electrical Characteristics of the IGBT T_C=25 , unless otherwise noted

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
OFF						
Collector Emitter Breakdown Voltage	BV_{CES}	V_{GE} = 0V, I_C = 1mA	1200	--	--	V
Zero Gate Voltage Collector Current	I_{CES}	V_{CE} = 1200V, V_{GE} = 0V	--	--	1	mA
Gate Emitter Leakage Current	I_{GES}	V_{CE} = 0V, V_{GE} = ± 20V	--	--	± 250	nA
ON						
Gate Emitter Threshold Voltage	$V_{GE(TH)}$	V_{GE} = V_{CE}, I_C = 30mA	3.5	5.5	7.5	V
Collector Emitter Saturation Voltage	$V_{CE(SAT)}$	V_{GE} = 15V, I_C = 30A, T_C = 25 °C	--	2.0	2.5	V
		V_{GE} = 15V, I_C = 30A, T_C = 125 °C	--	2.3	--	V
DYNAMIC						
Input Capacitance	C_{IES}	V_{CE} = 30V, V_{GE} = 0V f = 1MHz	--	4000	--	pF
Output Capacitance	C_{OES}		--	105	--	pF
Reverse Transfer Capacitance	C_{RES}		--	72	--	pF
SWITCHING (Note 2)						
Turn-On Delay Time	$t_{d(on)}$	V_{CC} = 600V, I_C = 30A R_G = 10 , V_{GE} = 15V Inductive Load, T_C = 25 °C	--	40	--	ns
Rise Time	t_r		--	50	--	ns
Turn-Off Delay Time	$t_{d(off)}$		--	245	--	ns
Fall Time	t_f		--	70	150	ns
Turn-On Switching Loss	E_{ON}		--	4.5	6.75	mJ
Turn-Off Switching Loss	E_{OFF}		--	0.85	1.28	mJ
Total Switching Loss	E_{TS}		--	5.35	8.03	mJ
Turn-On Delay Time	$t_{d(on)}$	V_{CC} = 600V, I_C = 30A R_G = 10 , V_{GE} = 15V Inductive Load, T_C = 125 °C	--	46	--	ns
Rise Time	t_r		--	48	--	ns
Turn-Off Delay Time	$t_{d(off)}$		--	256	--	ns
Fall Time	t_f		--	142	--	ns
Turn-On Switching Loss	E_{ON}		--	4.87	7.30	mJ
Turn-Off Switching Loss	E_{OFF}		--	1.82	2.73	mJ
Total Switching Loss	E_{TS}		--	6.67	10.03	mJ
Total Gate Charge	Q_g	V_{CC} = 600V, I_C = 30A V_{GE} = 15V	--	220	330	nC
Gate-Emitter Charge	Q_{ge}		--	30	45	nC
Gate-Collector Charge	Q_{gc}		--	90	135	nC

Not subject to production test verified by design/characterization

Electrical Characteristics of the DIODE T_C=25 , unless otherwise noted

Parameter	Symbol	Test condition		Min.	Typ.	Max.	Unit
Diode Forward Voltage	V_{FM}	I_F = 30A	T_C = 25 °C	--	2.25	2.75	V
			T_C = 125 °C	--	2.53	--	
Reverse Recovery Time	t_{rr}	I_F = 30A, di/dt = 200A/μs	T_C = 25 °C	--	300	450	ns
			T_C = 125 °C	--	360	--	
Reverse Recovery Current	I_{rr}		T_C = 25 °C	--	30	45	A
			T_C = 125 °C	--	34	--	
Reverse Recovery Charge	Q_{rr}		T_C = 25 °C	--	4400	--	nC
			T_C = 125 °C	--	6120	--	

IGBT Characteristics

Fig. 7 Turn-on time vs. gate resistor

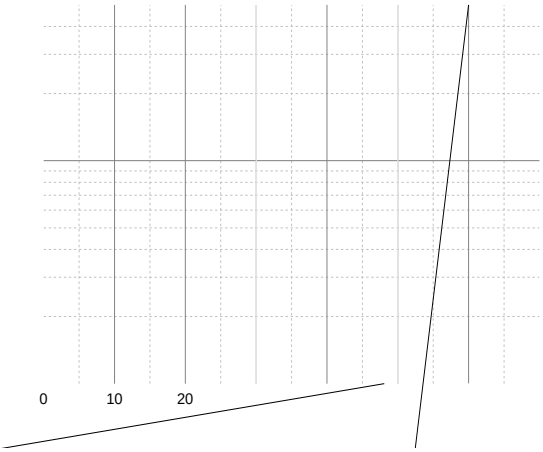


Fig. 8 Turn-off time vs. gate resistor

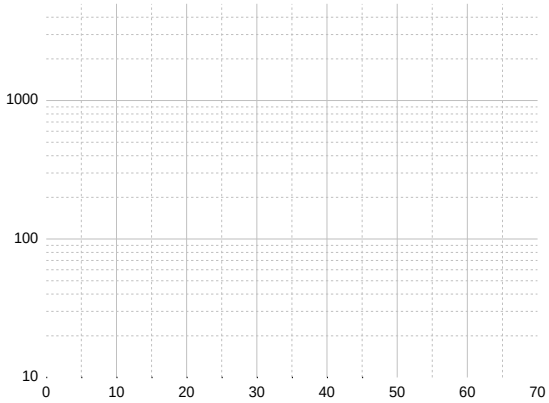


Fig. 9 Switching loss vs. gate resistor

Fig. 10 Turn-on time vs. collector current

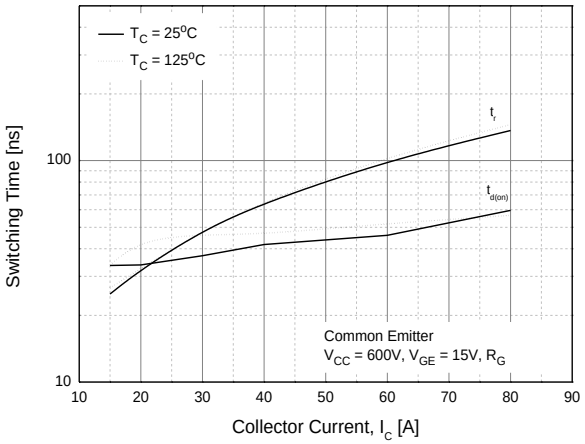


Fig. 11 Turn-off time vs. collector current

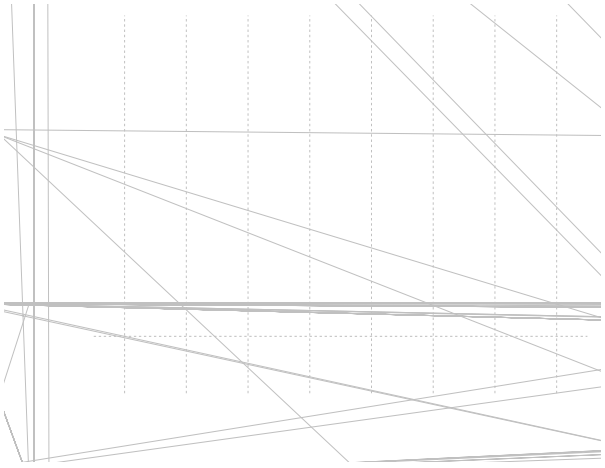
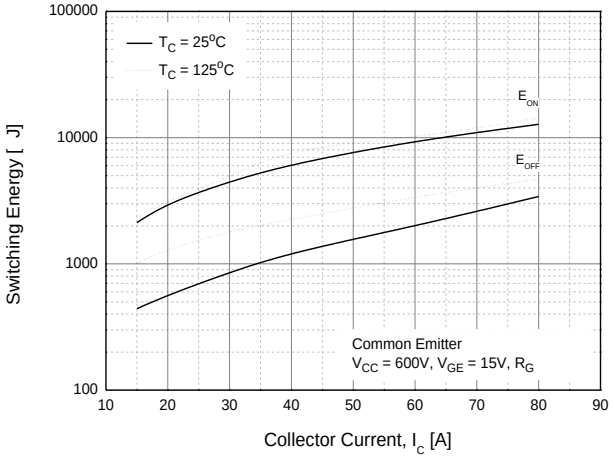


Fig. 12 Switching loss vs. collector current



IGBT Characteristics

Fig. 13 Gate charge characteristics

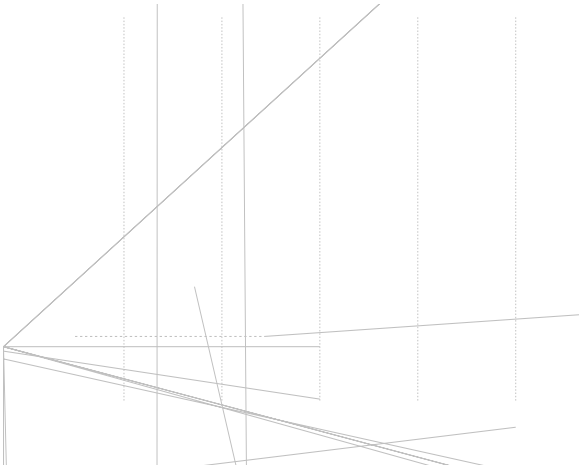


Fig. 14 SOA

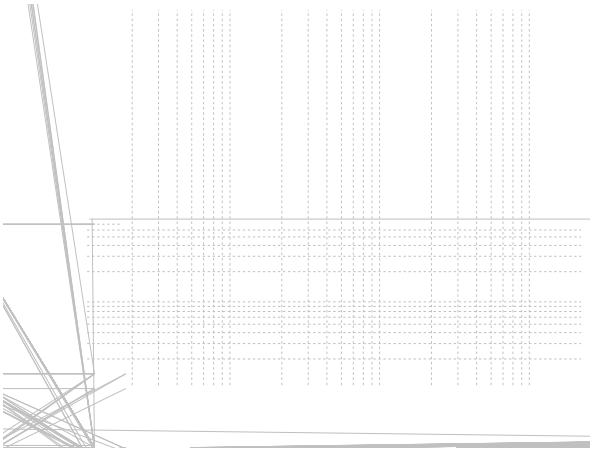


Fig. 15 RBSOA

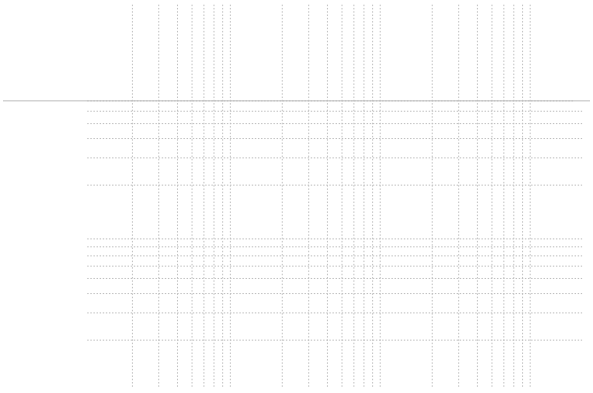


Fig. 16 Transient thermal impedance of IGBT

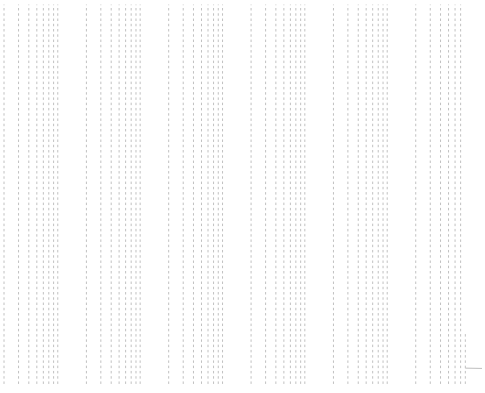
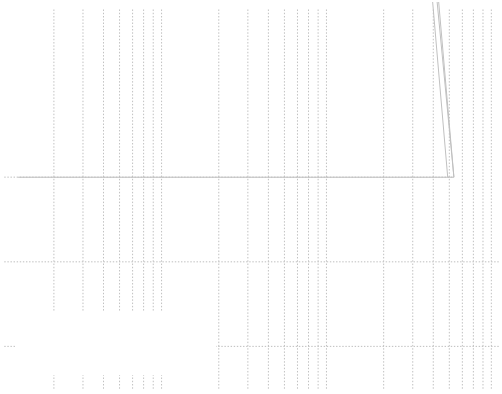


Fig. 17 Load Current vs. Frequency



Diode Characteristics

Fig. 18 Conduction characteristics

Fig. 19 Reverse recovery current vs. forward current

Fig. 20 Reverse recovery charge vs. forward current

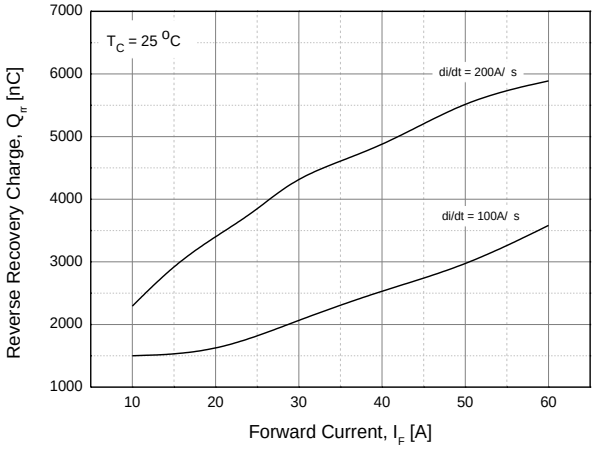
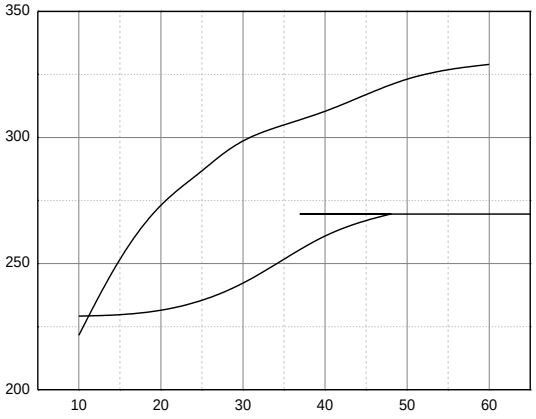
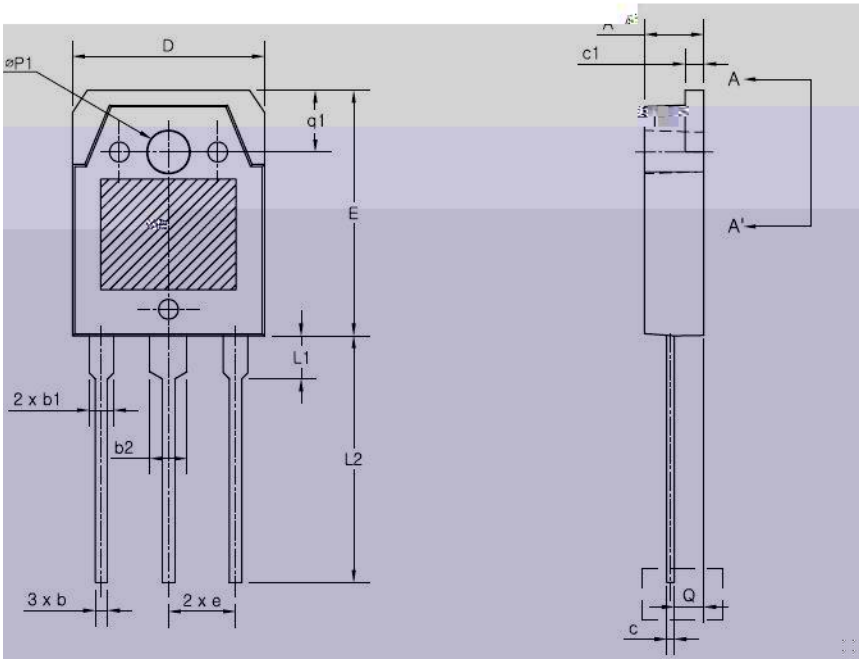
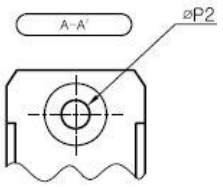


Fig. 21 Reverse recovery time vs. forward current



TO-3PN MECHANICAL DATA





SYMBOL	MIN	NOM	MAX
A	4.60	4.80	5.00
b	0.80	1.00	1.20
b1	1.80	2.00	2.20
b2	2.80	3.00	3.20
c	0.55	0.60	0.75
c1	1.45	1.50	1.65
D	15.40	15.60	15.80
E	19.70	19.90	20.10
e	5.15	5.45	5.75
L1	3.30	3.50	3.70
L2	19.80	20.00	20.20

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