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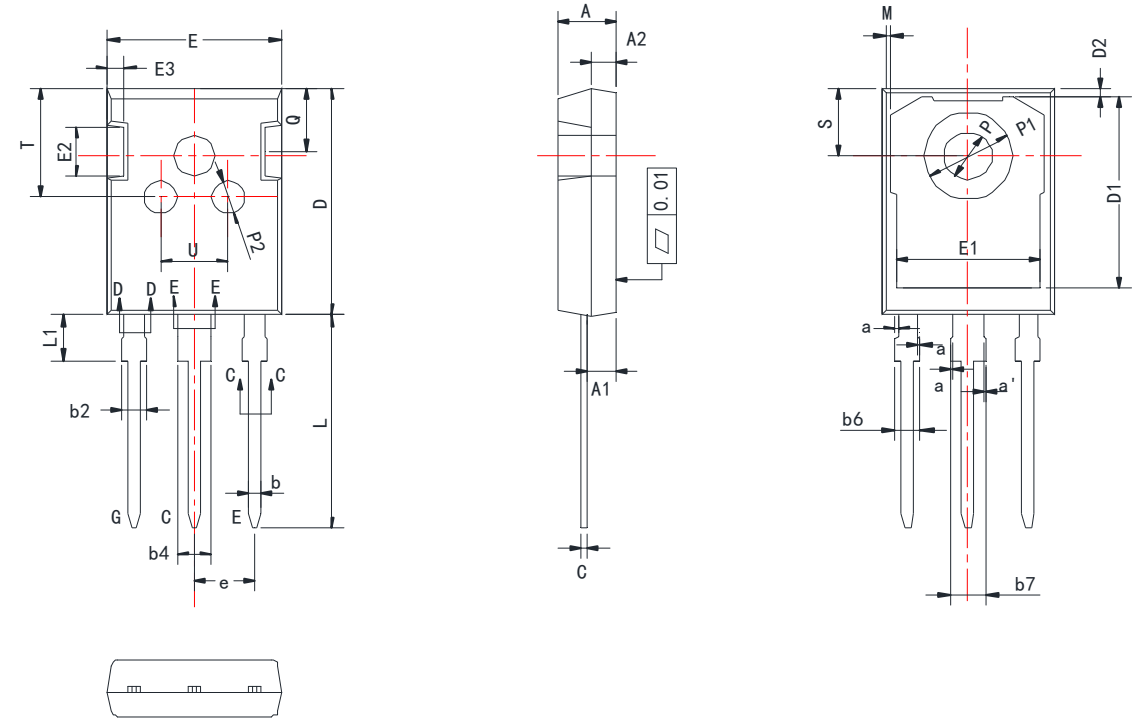
DATA SHEET

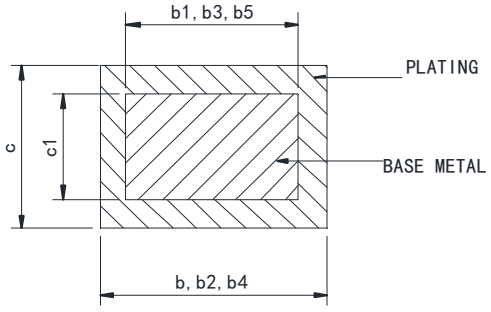
PART NO. : PC40H060AA

REV : A / 0

CUSTOMER'S APPROVAL : _____ DCC : _____

Package Dimensions





SECTION C-C, D-D&E-E

Common dimensions(mm)							
Symbol	**Min**	**Typ**	**Max**	**Symbol**	**Min**	**Typ**	**Max**
A	4.83	-	5.21	D1	16.25	-	17.65
A1	2.27	2.41	2.54	D2	0.95	1.17	1.35
A2	1.85	-	2.16	E	15.7	15.9	16.13
b	1.07	-	1.33	E1	13.1	-	14.15
b1	-	-	-	2*E2	3.68	-	5.1
b2	1.9	-	2.41	e	5.4TYP		
b3	-	-	-	L	19.8	19.92	20.3
b4	2.87	-	3.38	L1	4.1	-	4.47
b5	-	-	-	P	3.51	3.6	3.65
c	0.55	-	0.68	P1	-	-	7.4
c1	-	-	-	S	6.15 BSC		
D	20.9	21.0	21.1	Q	5.49	5.7	6.0

Trench Field-Stop Technology IGBT

PC40H060AA

REV:A / 0

Features

600V, 40A

$V_{CE(sat)(typ.)}$ =1.85V@V_{GE}=15V, I_C=40A

Maximum Junction Temperature 150℃

Applications

SMPS

General inverters

Other switching applications

Key Performance and Package Parameters

V_{CE}	I_C	V_{CEsat}, T_{vj}=25℃	T_{vjmax}
600V	40A	1.85V	150℃

Absolute Maximum Ratings（TC=25℃ unless otherwise noted）

Symbol	Parameter	Value	Units
V_{CES}	Collector-Emitter Voltage	600	V
V_{GES}	Gate-Emitter Voltage	± 20	V
I_C	Continuous Collector Current (T_C=25 ℃)	70	A
	Continuous Collector Current (T_C=100℃)	40	A
I_{CM}	Pulsed Collector Current	120	A
P_D	Maximum Power Dissipation (T_C=25 ℃)	190	W
	Maximum Power Dissipation (T_C=100℃)	75	W
T_J	Operating Junction Temperature Range	-55 to +150	℃
T_{STG}	Storage Temperature Range	-50 to +150	℃

Thermal Data

Symbol	Parameter	Max.	Units
$R_{th\ j\text{-}c}$	Thermal Resistance, Junction to case for IGBT	0.65	℃/ W
$R_{th\ j\text{-}c}$	Thermal Resistance, Junction to case for Diode	1.1	℃/ W
$R_{th\ j\text{-}a}$	Thermal Resistance, Junction to Ambient	40	℃/ W

Electrical Characteristics (Tc=25℃ unless otherwise noted.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{CES}	Collector-Emitter Breakdown Voltage	V_{GE}= 0V, I_C= 250uA	600	-	-	V
I_{CES}	Collector-Emitter Leakage Current	V_{CE}= 600V, V_{GE}= 0V	-	-	100	uA
I_{GES}	Gate Leakage Current, Forward	V_{GE}=30V, V_{CE}= 0V	-	-	100	nA
	Gate Leakage Current, Reverse	V_{GE}= -30V, V_{CE}= 0V	-	-	100	nA
$V_{GE(th)}$	Gate Threshold Voltage	V_{GE}= V_{CE}, I_C= 250uA	4.5	-	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	V_{GE}=15V, I_C= 40A	-	1.85	2.3	V
Qg	Total Gate Charge	V_{CC}=400V V_{GE}=15V I_C=40A	-	95.8		nC
Qge	Gate-Emitter Charge		-	33.3		nC
Qgc	Gate-Collector Charge		-	44.2		nC
$t_{d(on)}$	Turn-on Delay Time	V_{CC}=400V V_{GE}=15V I_C=40A R_G=28Ω Inductive Load T_C=25 ℃	-	40	-	ns
t_r	Turn-on Rise Time		-	60	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	230	-	ns
t_f	Turn-off Fall Time		-	35	-	ns
Eon	Turn-on Switching Loss		-	1.25	-	mJ
Eoff	Turn-off Switching Loss		-	0.65	-	mJ
Ets	Total Switching Loss		-	1.9	-	mJ
Cies	Input Capacitance	V_{CE}=25V V_{GE}=0V f = 1MHz	-	3.0	-	pF
Coes	Output Capacitance		-	93.0	-	pF
Cres	Reverse Transfer Capacitance		-	26.0	-	pF
SCSOA	Short Circuit Safe Operation Area	V_{GE}=15V, V_{CC}≤400V, $T_{J,start}$≤25℃	10	---	---	uS

Diode Characteristics (TC=25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_F	Diode Forward Voltage	I_F=30A Ta=25℃	-	1.35	1.6	V
t_{rr}	Diode Reverse Recovery Time	VCE = 400V IF= 30A dIF/dt = 200A/us	-	95		ns
I_{rr}	Diode peak Reverse Recovery Current		-	32		A
Q_{rr}	Diode Reverse Recovery Charge		-	1.95		uC

Note1：Repetitive rating, pulse width limited by maximum junction temperature

Typical Characteristics

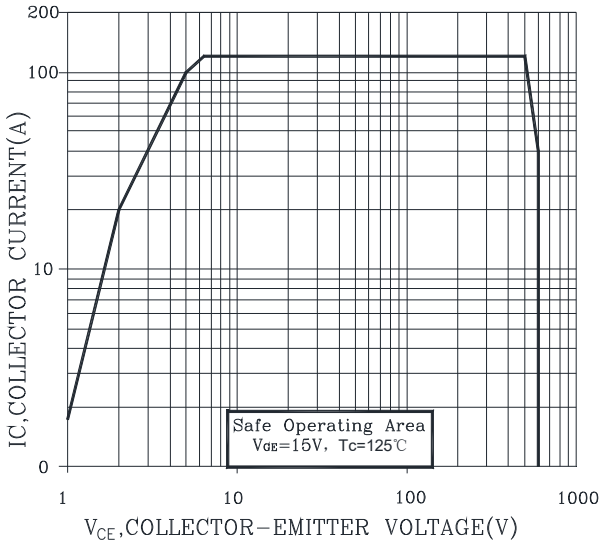


Fig. 1 Forward bias safe operating area

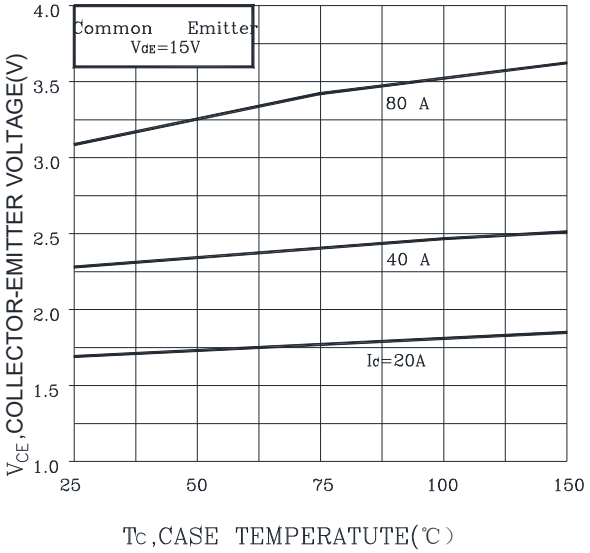


Fig. 2 Saturation Voltage vs. Case Temperature

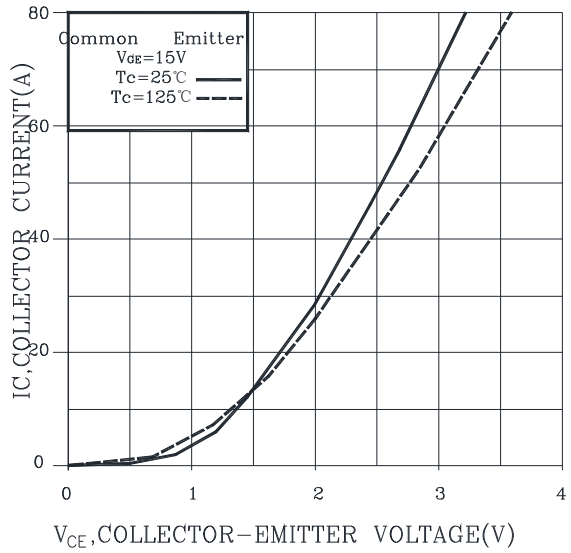


Fig. 3 Typical Saturation Voltage Characteristics

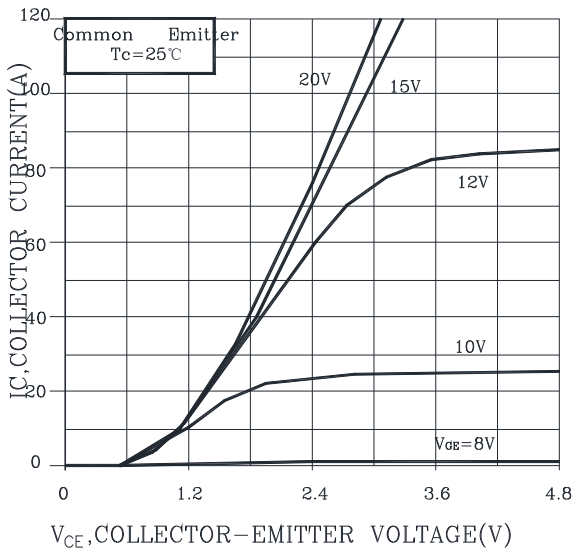


Fig. 4 Typical output characteristic

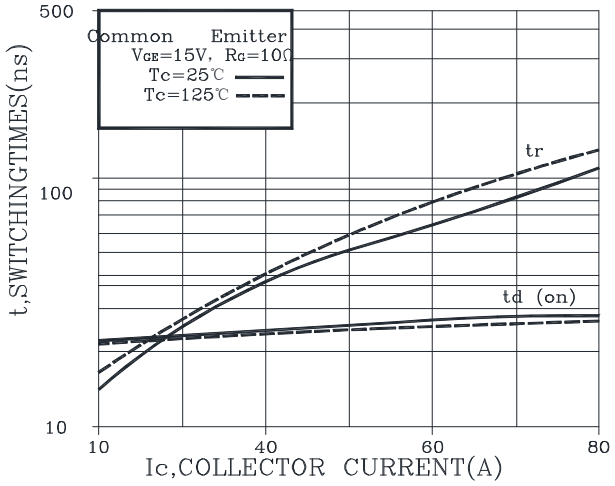


Fig. 5 Turn-On Characteristics vs.Collector Current

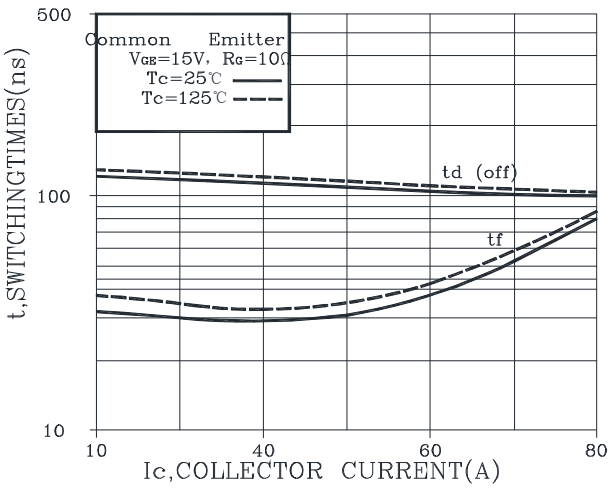


Fig. 6 Turn-Off Characteristics vs.Collector Current

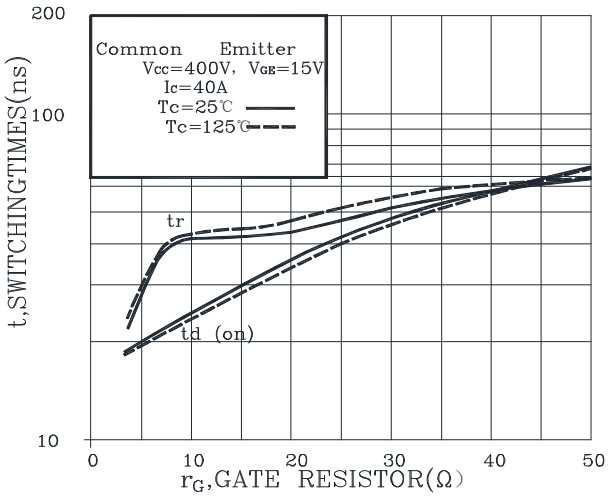


Fig. 7 Turn-On Characteristics vs. Gate Resistance

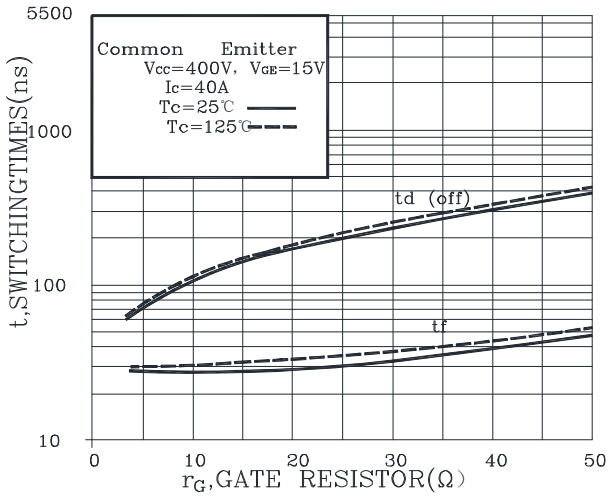


Fig. 8 Turn-Off Characteristics vs. Gate Resistance

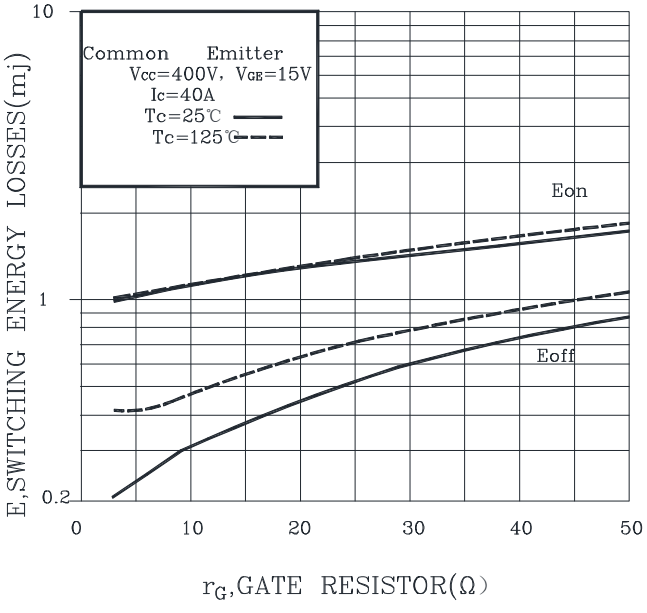


Fig. 9 Switching Loss vs. Gate Resistance

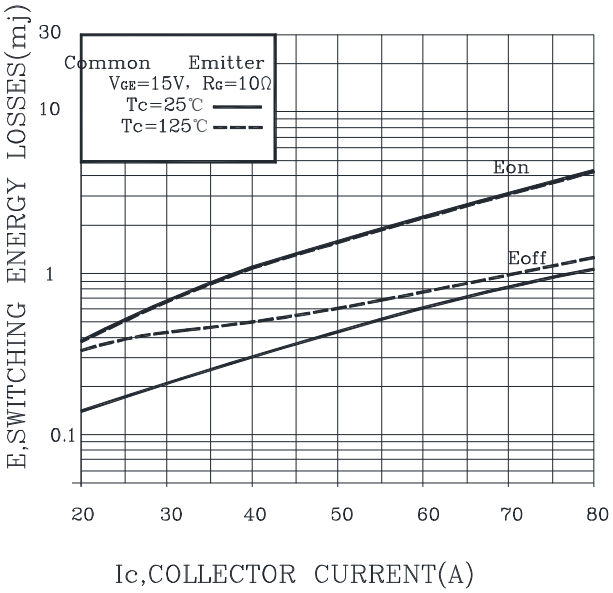


Fig. 10 Typical switching energy losses as a function of collector current

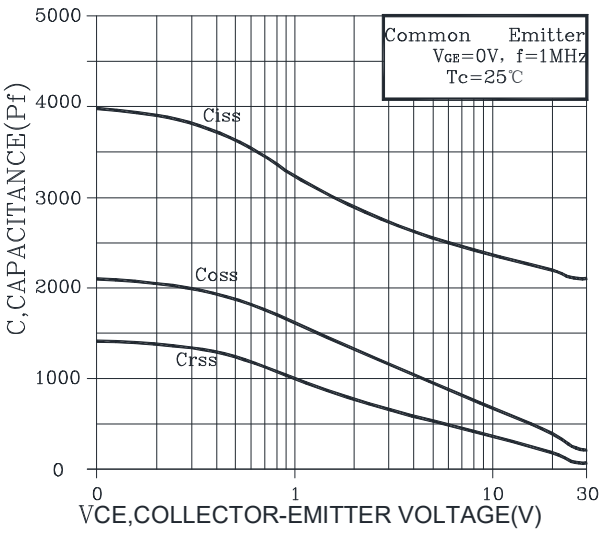


Fig. 11 Capacitance Characteristics

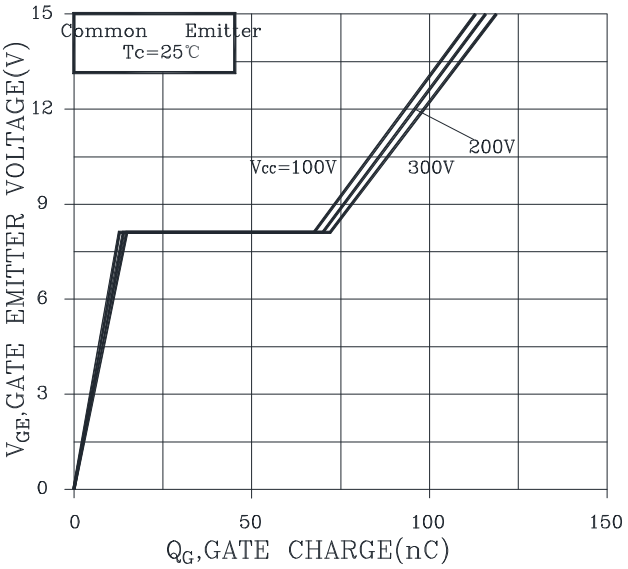


Fig. 12 Gate Charge Characteristics

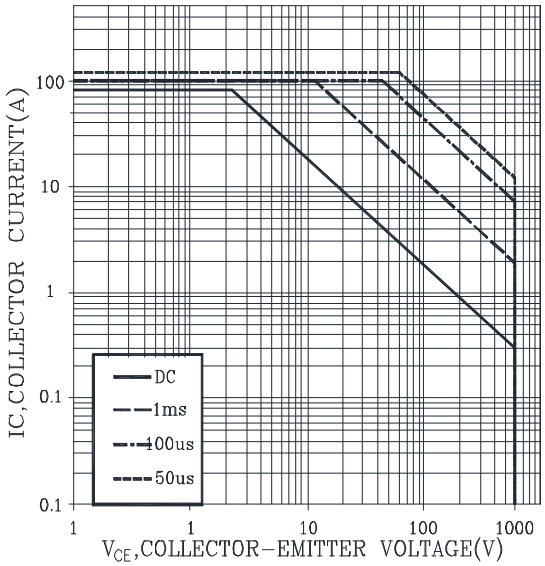


Fig. 13 Forward SOA

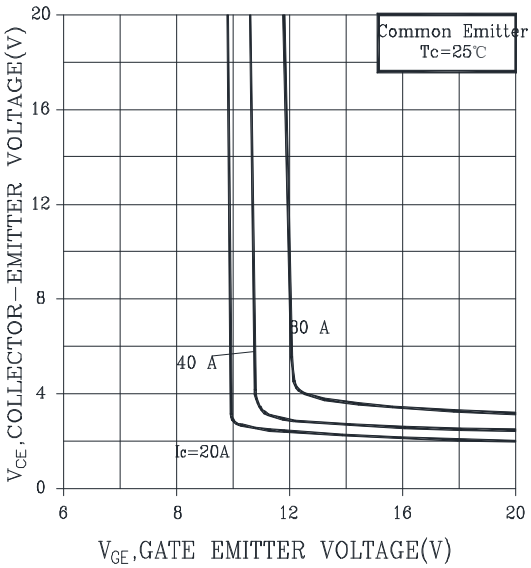


Fig. 14 Saturation Voltage vs. VGE

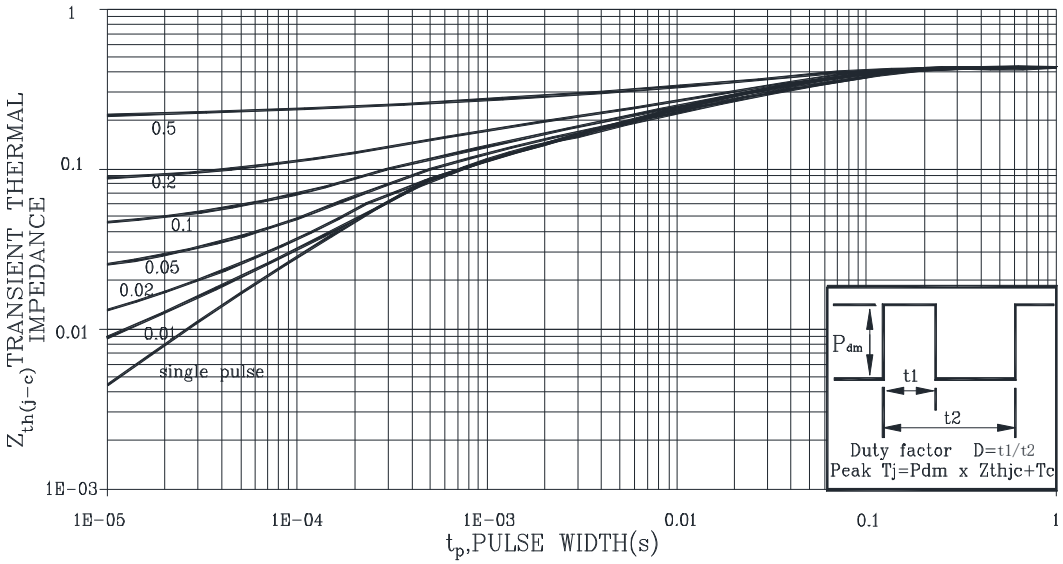


Fig. 19 Normalized Transient Thermal Impedance, Junction-To-Case

Note1.Duty factor D=t1/t2; Note2:peak TJ=PDM×Zthjc+TC

● PART NO. SYSTEM :

P C 15 H 120 A C