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DATA SHEET

PART NO. : LD040A120H247P3-S64

REV : A / 0

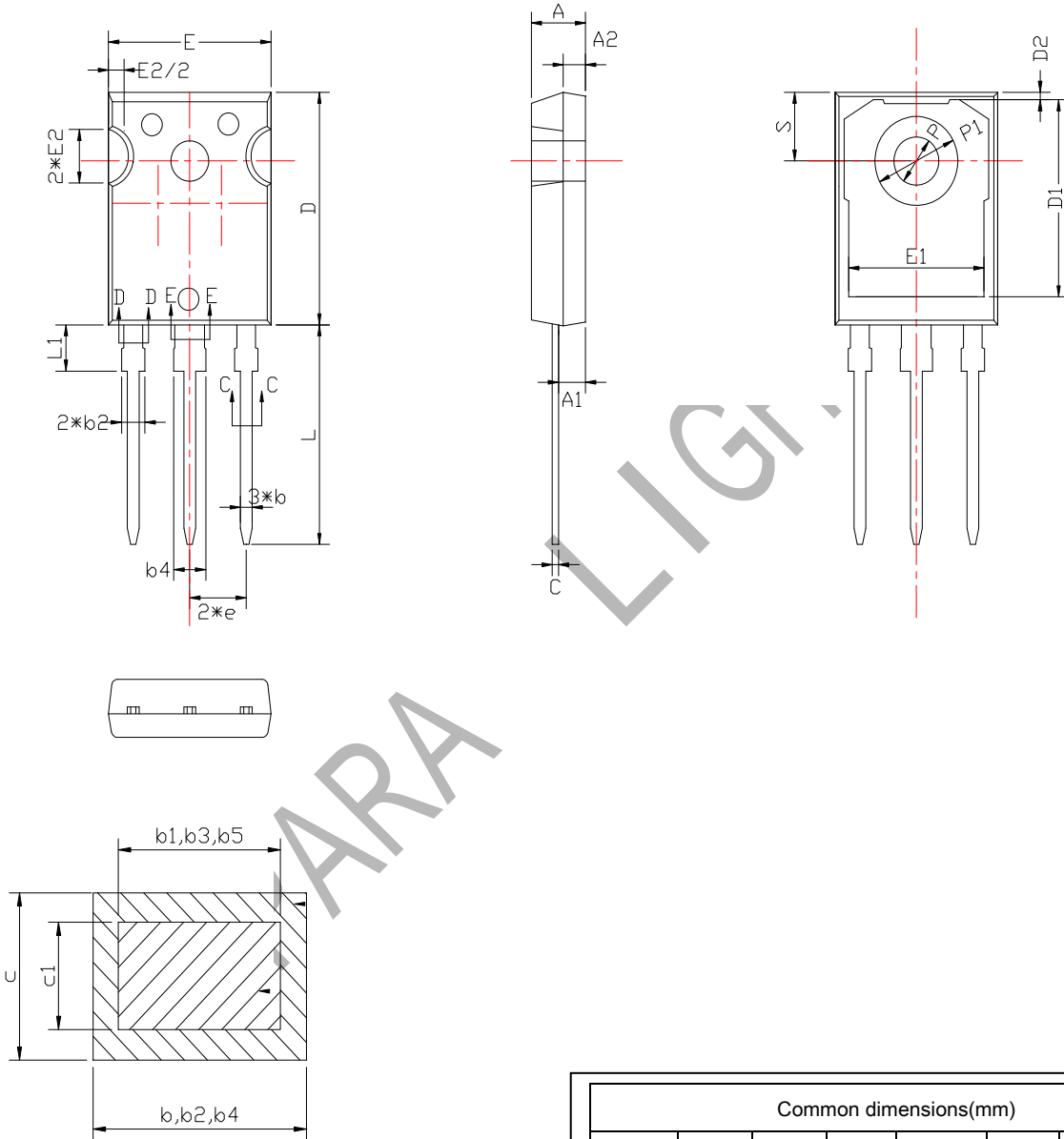
CUSTOMER'S APPROVAL : _____ DCC : _____

DRAWING NO. : DS-91P-22-0008

DATE : 2022-06-25

Page : 1

Package Dimensions



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

Common dimensions(mm)							
Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	4.9	5.0	5.1	D1	16.25	16.55	16.85
A1	2.31	2.41	2.51	D2	1.05	1.17	1.35
A2	1.9	2.0	2.1	E	15.7	15.8	15.9
b	1.16	-	1.26	E1	13.2	-	-
b1	1.15	1.2	1.22	E2	4.9	5.0	5.1
b2	1.96	-	2.06	e	5.436BSC		
b3	1.95	2.0	2.02	L	19.8	19.92	20.1
b4	2.96	-	3.06	L1	-	-	4.3
b5	2.95	3.0	3.02	P	3.5	3.6	3.7
c	0.59	-	0.66	P1	-	-	7.4
c1	0.58	0.6	0.62	S	6.05	6.15	6.25
D	20.9	21.0	21.1	t	0.00	-	0.15

Features

1200V, 40A

$V_{CE(sat)(typ.)} = 2.1V @ V_{GE} = 15V, I_C = 40A$

Maximum Junction Temperature 155°C

Applications

Solar Converters

Uninterrupted Power Supply

Welding Converters

Mid to High Range Switching Frequency Converters

Key Performance and Package Parameters

V_{CE}	I_C	$V_{CEsat}, T_{vj}=25^{\circ}C$	T_{vjmax}
1200V	40A	2.1V	155°C

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{CES}	Collector-Emitter Voltage	1200	V
V_{GES}	Gate-Emitter Voltage	± 30	V
I_C	Continuous Collector Current ($T_C = 25^{\circ}C$)	80	A
	Continuous Collector Current ($T_C = 100^{\circ}C$)	40	A
I_{CM}	Pulsed Collector Current (Note 1)	120	A
P_D	Maximum Power Dissipation ($T_C = 25^{\circ}C$)	300	W
	Maximum Power Dissipation ($T_C = 100^{\circ}C$)	110	W
T_J	Operating Junction Temperature Range	-55 to +150	°C
T_{STG}	Storage Temperature Range	-55 to +150	°C

Thermal Data

Symbol	Parameter	Max.	Units
$R_{th\ j-c}$	Thermal Resistance, Junction to case for IGBT	0.42	°C/ W
$R_{th\ j-c}$	Thermal Resistance, Junction to case for Diode	0.8	°C/ W
$R_{th\ j-a}$	Thermal Resistance, Junction to Ambient	40	°C/ W

Electrical Characteristics (Tc=25°C unless otherwise noted.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units	
BV _{CES}	Collector-Emitter Breakdown Voltage	V _{GE} = 0V, I _C = 250uA	1200	-	-	V	
I _{CES}	Collector-Emitter Leakage Current	V _{CE} = 1200V, 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	4.0	-	6.0	V	
V _{CE(sat)}	Collector-Emitter Saturation Voltage	V _{GE} =15V, I _C = 40A	-	2.1		V	
Q _g	Total Gate Charge	V _{CC} =600V V _{GE} =15V I _C =40A	-	107		nC	
Q _{ge}	Gate-Emitter Charge		-	36		nC	
Q _{gc}	Gate-Collector Charge		-	58		nC	
t _{d(on)}	Turn-on Delay Time	V _{CC} =600V V _{GE} =15V I _C =40A R _G =10 Inductive Load T _C =25 °C	-	45	-	ns	
t _r	Turn-on Rise Time		-	76	-	ns	
t _{d(off)}	Turn-off Delay Time		-	270	-	ns	
t _f	Turn-off Fall Time		-	40	-	ns	
E _{on}	Turn-on Switching Loss		-	4.5	-	mJ	
E _{off}	Turn-off Switching Loss		-	2.5	-	mJ	
E _{ts}	Total Switching Loss		-	7.0	-	mJ	
C _{ies}	Input Capacitance		V _{CE} =30V V _{GE} =0V	-	3000	-	pF
C _{oes}	Output Capacitance		f = 1MHz	-	80	-	pF
C _{res}	Reverse Transfer Capacitance		-	30	-	pF	

Diode Characteristics (TC=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_F	Diode Forward Voltage	$I_F=40A$	-	2.2	3.2	V
t_{rr}	Diode Reverse Recovery Time	$V_{CE} = 600V$ $I_F = 40A$ $dI_F/dt = 200A/us$	-	250		ns
I_{rr}	Diode peak Reverse Recovery Current		-	10		A
Q_{rr}	Diode Reverse Recovery Charge		-	1350		nC

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

Typical Characteristics

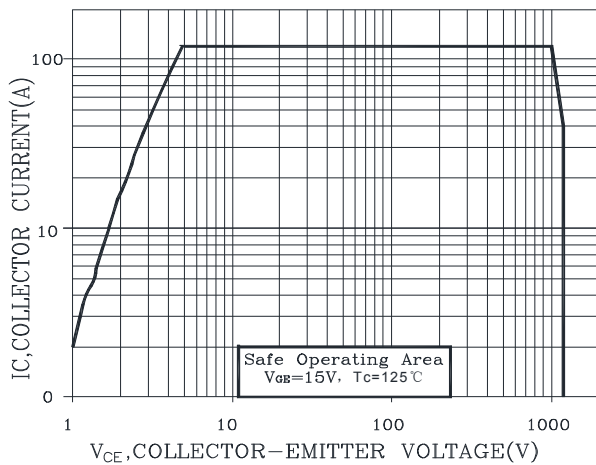


Fig. 1 Forward bias safe operating area
(Tj=125°C; VGE=15V)

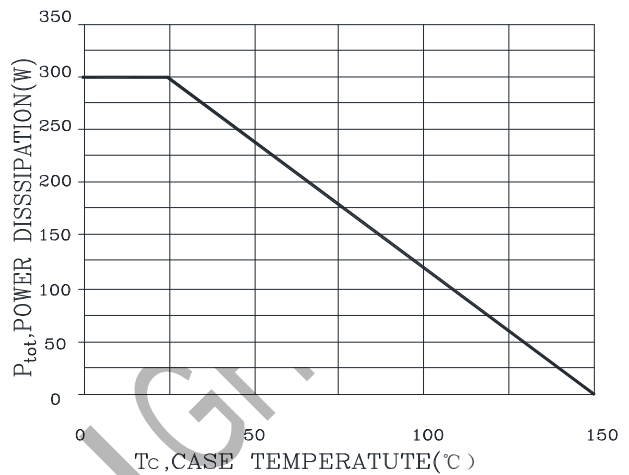


Fig. 2 Power dissipation as a function of case temperature

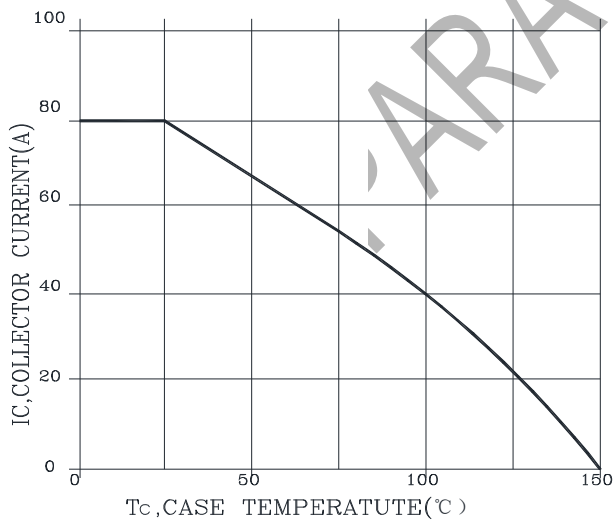


Fig. 3 Collector current as a function of case temperature

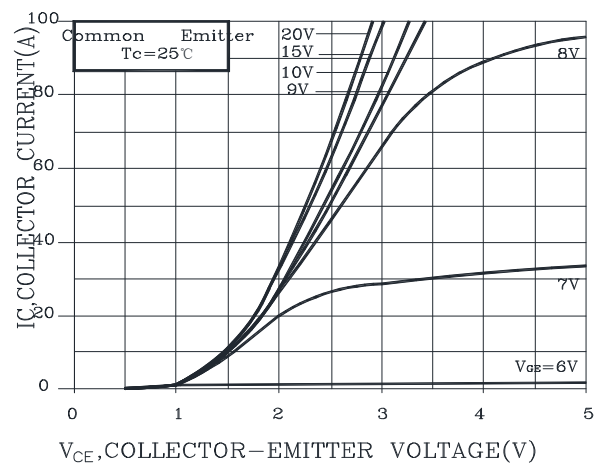


Fig. 4 Typical output characteristic
(Tj=25°C; tp=300us)

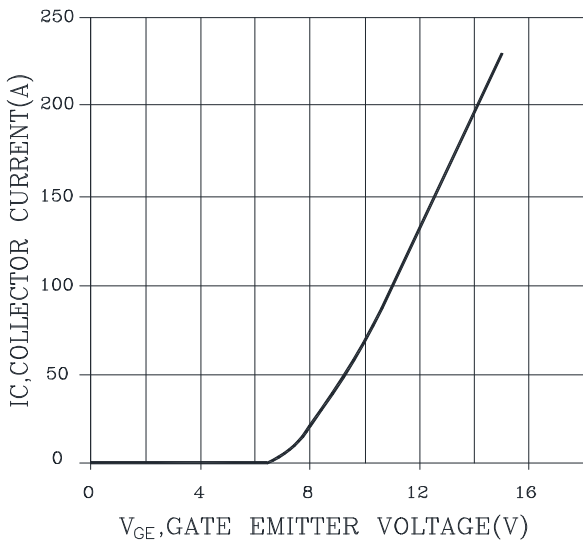


Fig. 5 Typical transfer characteristics ($V_{CE}=20V$, $t_p=20\mu s$)

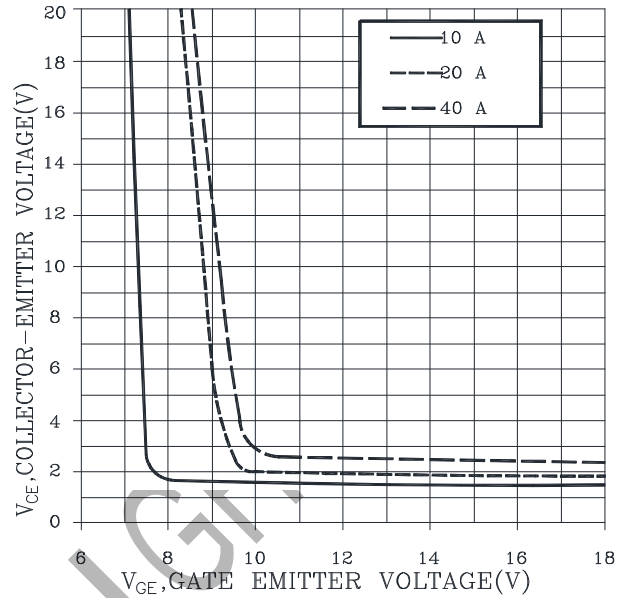


Fig. 6 Typical V_{CE} VS. V_{GE} ($T_J=25^\circ C$)

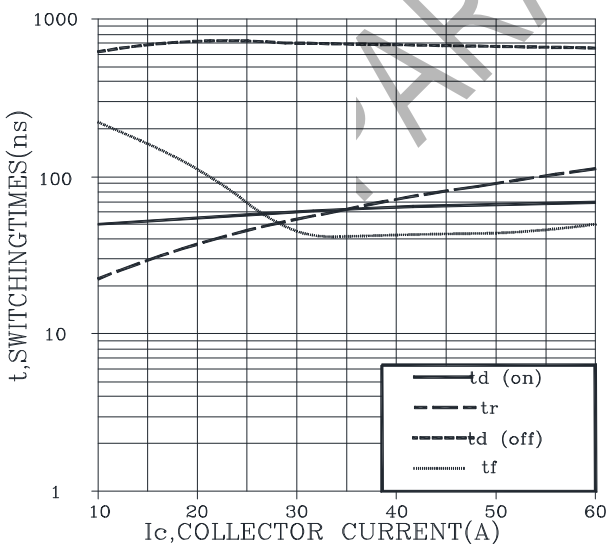


Fig. 7 Typical switching times as a function of collector current (inductive load, $T_C=25^\circ C$, $L=500\mu H$, $V_{CE}=600V$, $V_{GE}=15V$, $R_g=28\Omega$)

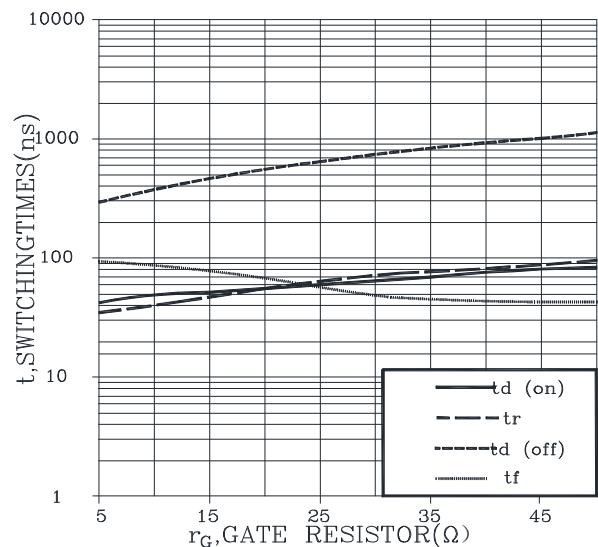


Fig. 8 Typical switching times as a function of gate resistance (inductive load, $T_C=25^\circ C$, $L=500\mu H$, $V_{CE}=600V$, $V_{GE}=15V$, $I_c=20A$)

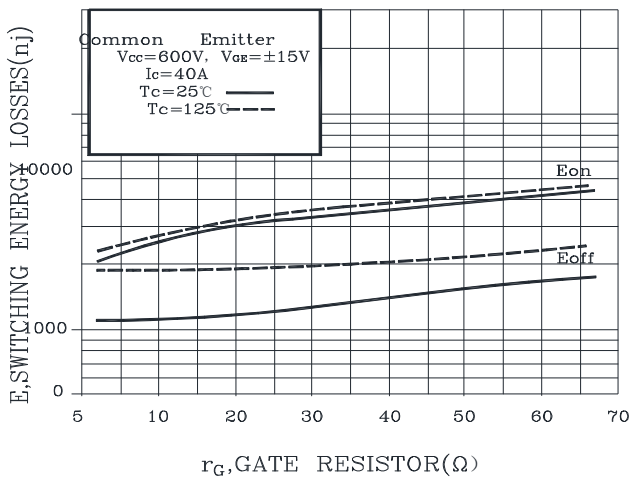


Fig. 9 Typical energy loss VS. R_g ,
 (inductive load, $T_C=25^\circ C$, $L=500\mu H$,
 $V_{CE}=600V$, $V_{GE}=15V$, $I_C=40A$)

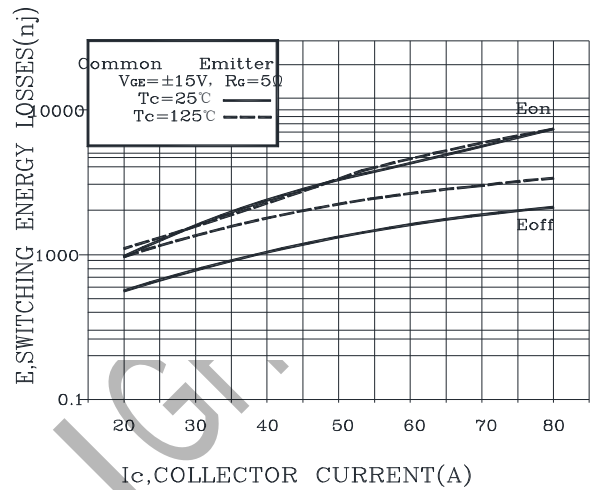


Fig. 10 Typical switching energy losses as a function of collector current (inductive load, $T_C=25^\circ C$, $L=500\mu H$, $V_{CE}=600V$, $V_{GE}=15V$, $R_g=5\Omega$)

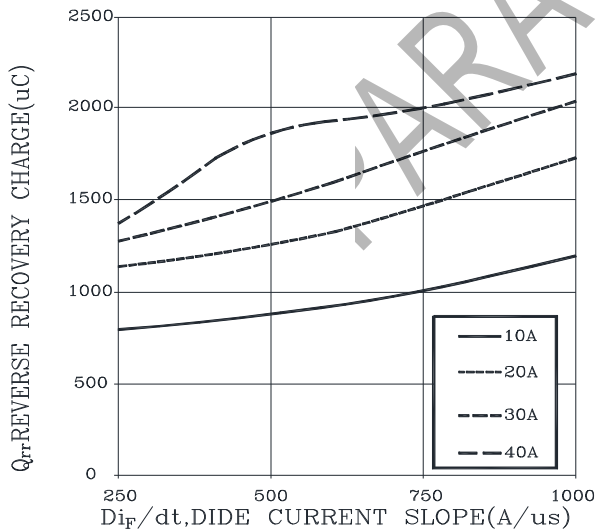


Fig. 11 Typical Diode Q_{rr} VS. dI_F/dt
 ($V_{CC}=600V$, $V_{GE}=15V$)

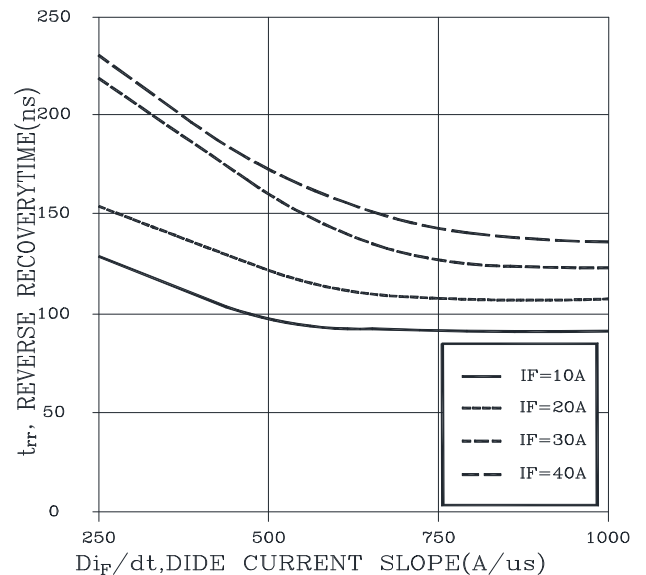


Fig. 12 Typical reverse recovery time as a function of diode current slope ($V_{CC}=600V$, $V_{GE}=15V$)

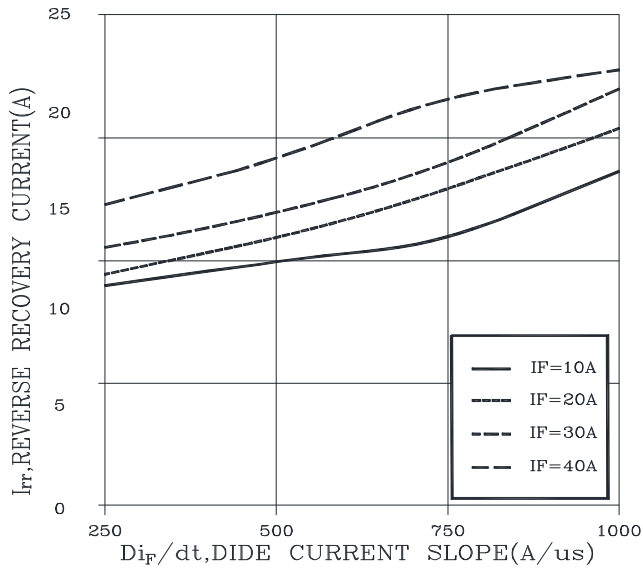


Fig. 13 Typical Diode I_{rr} VS. dI_F/dt
($V_{CC}=600V, V_{GE}=15V$)

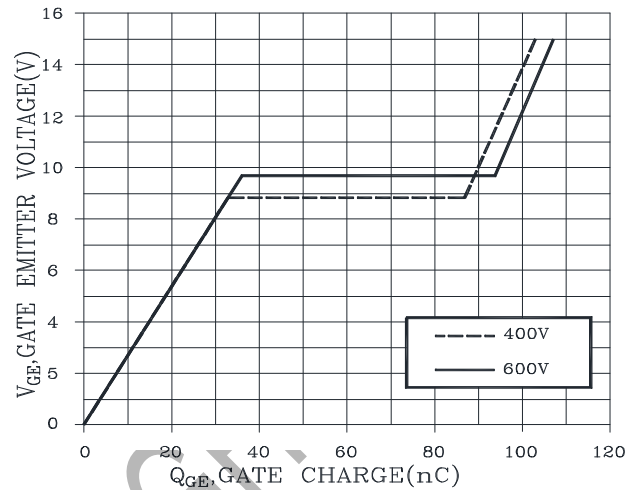


Fig. 14 Typical gate charge ($I_c=40A$)

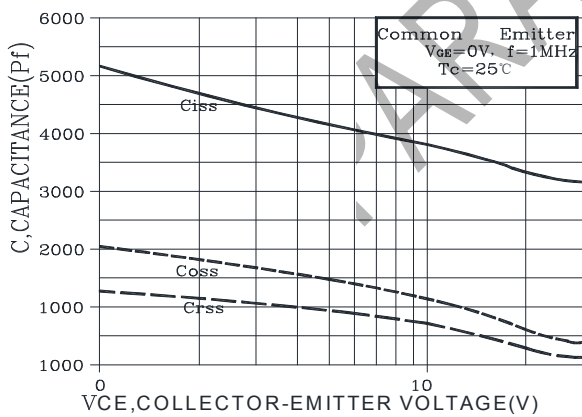


Fig. 15 Typical capacitance as a function of collector-emitter voltage ($V_{GE}=0V, f=100kHz$)

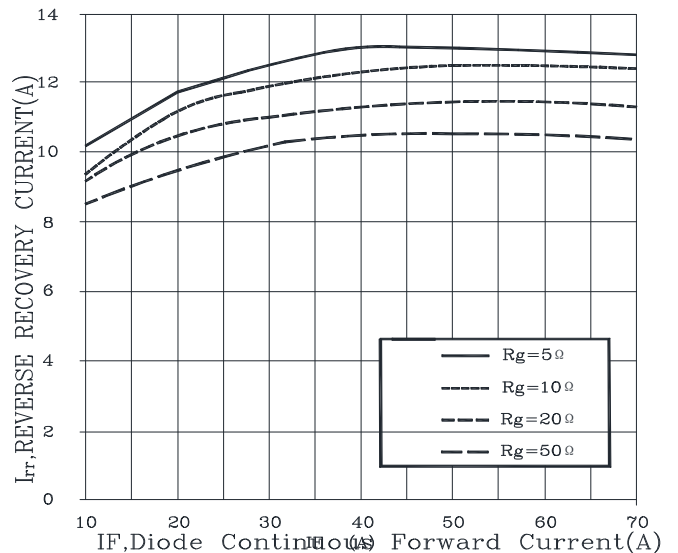
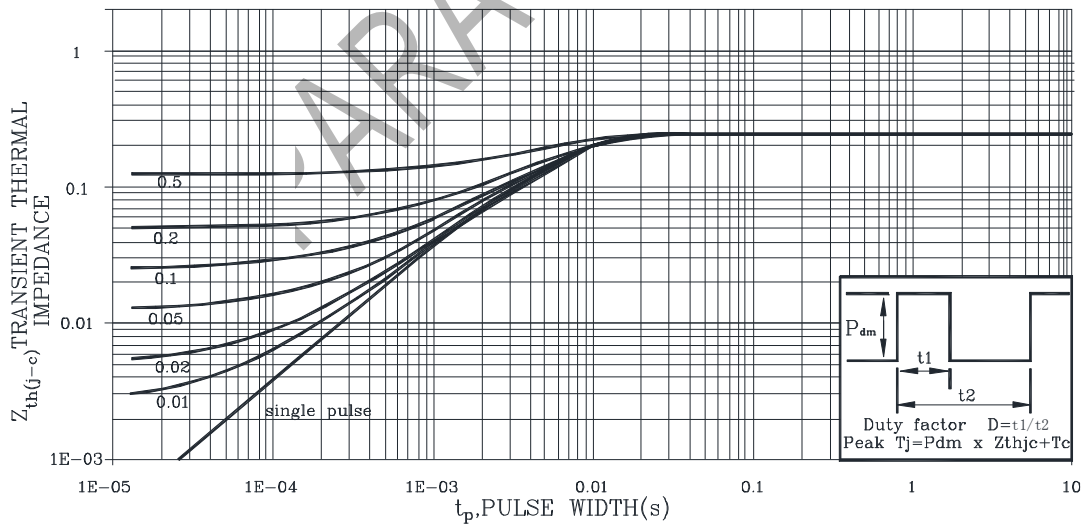
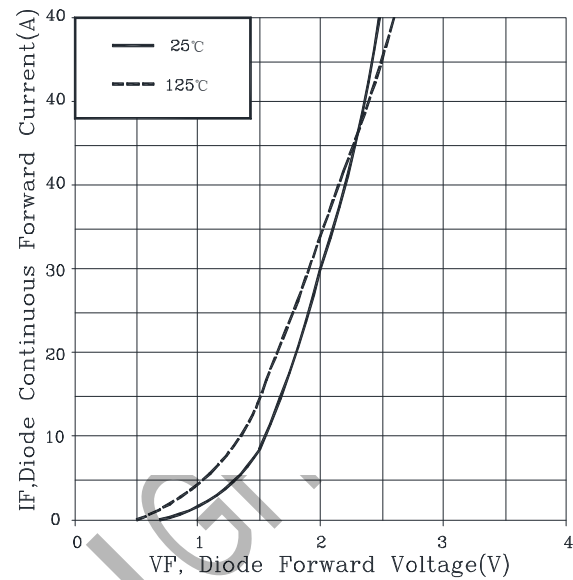
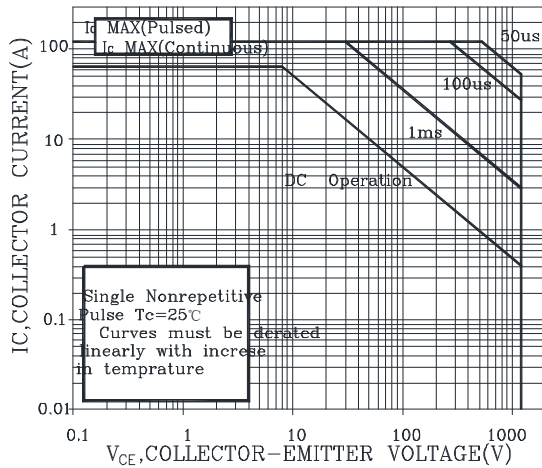


Fig. 16 Typical Diode I_{rr} VS. I_F
($T_C=25^\circ C, V_{CC}=600V, V_{GE}=15V$)





Trench Field-Stop Technology IGBT

LD040A120H247P3-S64

REV:A / 0

● PART NO. SYSTEM :

L D 015A 120 H 247 P3 -XXX

