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## DATA SHEET

PART NO. : LD075A060H247P3-S63

REV : A / 0

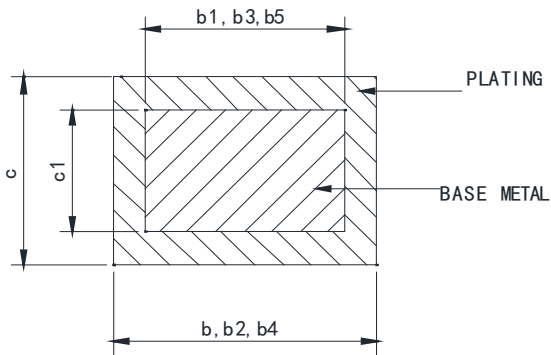
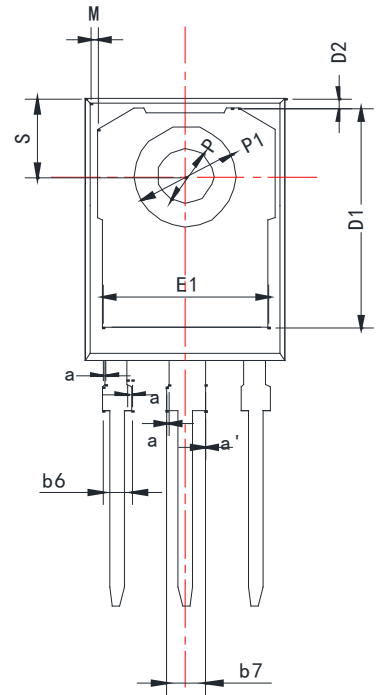
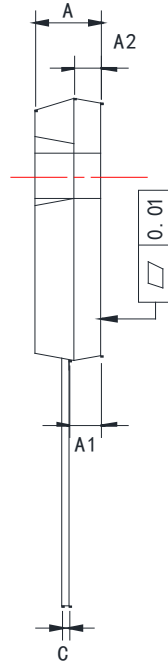
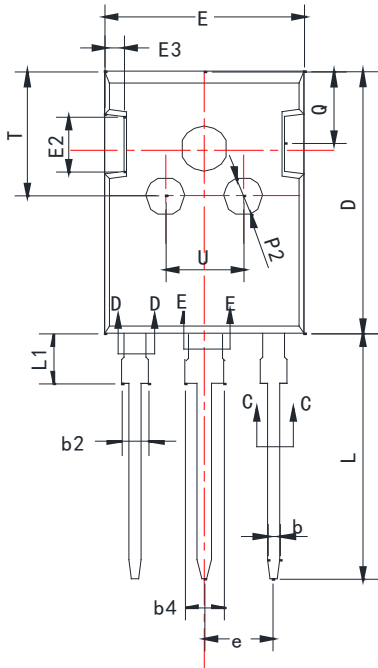
CUSTOMER'S APPROVAL : \_\_\_\_\_ DCC : \_\_\_\_\_

DRAWING NO. : DS-91P-22-0001

DATE : 2022-06-11

Page : 1

### Package Dimensions



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

Common dimensions(mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	4.85	5.0	5.1	D2	1.05	1.17	1.35
A1	2.31	2.41	2.51	E	15.7	15.8	15.9
A2	1.9	2.0	2.1	E1	13.1	13.3	13.5
a	0	-	0.15	E2	4.4	4.5	4.6
a'	0	-	0.15	E3	1.5	1.5	1.7
b	1.16	-	1.26	e	5.436		
b1	1.15	1.2	1.22	L	19.8	19.92	20.1
b2	1.96	-	2.06	L1	-	-	4.3
b3	1.95	2.0	2.02	M	0.35	-	0.95
b4	2.96	-	3.06	P	3.4	3.5	3.6
b5	2.96	3.0	3.02	P1	7.0	-	7.4
b6	-	-	2.25	P2	2.4	2.5	2.6
b7	-	-	3.25	Q	5.6	-	6.0
c	0.59	-	0.66	S	6.05	6.15	6.25
c1	0.58	0.6	0.62	T	9.8	-	10.2
D	20.9	21.0	21.1	U	6.0	-	6.4
D1	16.25	16.55	16.85				



# Trench Field-Stop Technology IGBT

LD075A060H247P3-S63

REV:A / 0

## Features

600V, 75A

$V_{CE(sat)(typ.)} = 1.80V @ V_{GE}=15V, I_C=75A$

Maximum Junction Temperature 175°C

Pb-free Lead Plating; RoHS Compliant

## Applications

Solar Converters

Uninterrupted Power Supply

Welding Converters

Mid to High Range Switching Frequency Converters

## Key Performance and Package Parameters

$V_{CE}$	$I_C$	$V_{CEsat}, T_{vj}=25^{\circ}C$	$T_{vjmax}$
600V	75A	1.80V	175°C

## Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
$V_{CES}$	Collector-Emitter Voltage	600	V
$V_{GES}$	Gate-Emitter Voltage	$\pm 20$	V
$I_C$	Continuous Collector Current ( $T_C=25^{\circ}C$ )	110	A
	Continuous Collector Current ( $T_C=100^{\circ}C$ )	75	A
$I_{CM}$	Pulsed Collector Current (Note 1)	300	A
$P_D$	Maximum Power Dissipation ( $T_C=25^{\circ}C$ )	385	W
	Maximum Power Dissipation ( $T_C=100^{\circ}C$ )	192	W
$T_J$	Operating Junction Temperature Range	-40 to 175	°C
$T_{STG}$	Storage Temperature Range	-55 to 150	°C

## Thermal Data

Symbol	Parameter	Max.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case for IGBT	0.39	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case for Diode	0.46	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	40	°C/W

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

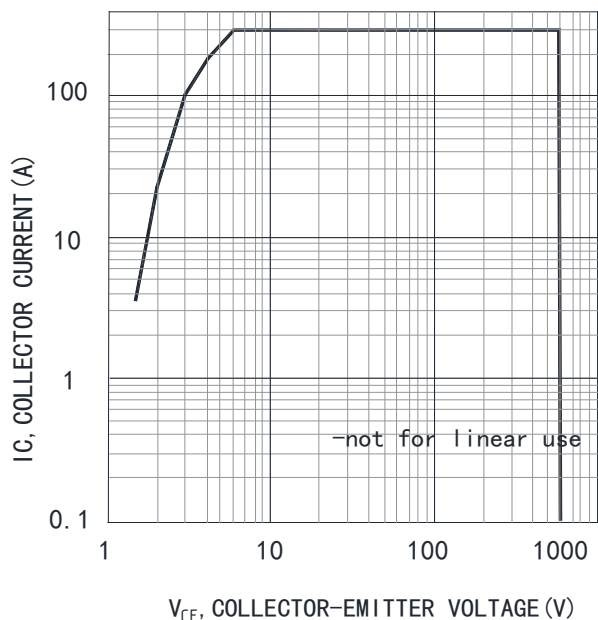
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{CES}$	Collector-Emitter Breakdown Voltage	$V_{GE}=0V, I_C=200\mu A$	600	---	---	V
$I_{CES}$	Collector-Emitter Leakage Current	$V_{CE}=600V, V_{GE}=0V$	---	---	75	$\mu A$
$I_{GES}$	Gate Leakage Current, Forward	$V_{GE}=20V, V_{CE}=0V$	---	---	100	nA
	Gate Leakage Current, Reverse	$V_{GE}=-20V, V_{CE}=0V$	---	---	100	nA
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE}=V_{CE}, I_C=750\mu A$	3.2	4	4.8	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE}=15V, I_C=75A, T_j=25^\circ C$	---	1.80	2.20	V
		$V_{GE}=15V, I_C=75A, T_j=125^\circ C$	---	2.05	---	V
$Q_G$	Total Gate Charge	$V_{CC}=520V$	---	115	---	nC
$Q_{GE}$	Gate-Emitter Charge	$V_{GE}=15V$	---	31	---	nC
$Q_{GC}$	Gate-Collector Charge	$I_C=75A$	---	28	---	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=400V$ $V_{GE}=\pm 15V$ $I_C=75A$ $R_G=8\Omega$ Inductive Load $T_C=25^\circ C$	---	27	---	ns
$t_r$	Turn-on Rise Time		---	82	---	ns
$t_{d(off)}$	Turn-off Delay Time		---	152	---	ns
$t_f$	Turn-off Fall Time		---	131	---	ns
$E_{on}$	Turn-on Switching Loss		---	1.72	---	mJ
$E_{off}$	Turn-off Switching Loss		---	2.51	---	mJ
$E_{is}$	Total Switching Loss		---	4.23	---	mJ
$C_{ies}$	Input Capacitance	$V_{CE}=25V$	---	3669	---	pF
$C_{oes}$	Output Capacitance	$V_{GE}=0V$	---	285	---	pF
$C_{res}$	Reverse Transfer Capacitance	$f=1MHz$	---	38	---	pF
SCSOA	Short Circuit Safe Operation Area	$V_{GE}=15V, V_{CC}\leq 400V,$ $T_{J,start}\leq 25^\circ C$	10	---	---	$\mu S$

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

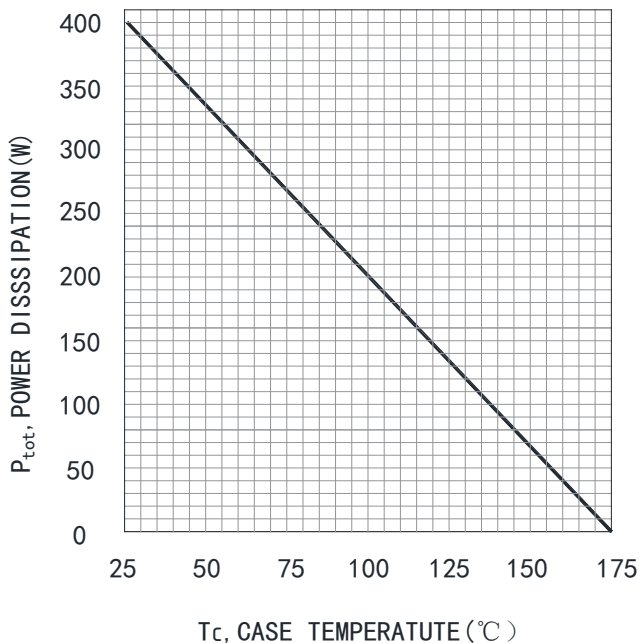
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V <sub>F</sub>	Diode Forward Voltage	I <sub>F</sub> =75A, T <sub>J</sub> =25°C	---	1.60	1.80	V
		I <sub>F</sub> =75A, T <sub>J</sub> =150°C	---	1.42	---	V
t <sub>rr</sub>	Diode Reverse Recovery Time	VR=400V	---	136	---	ns
I <sub>rr</sub>	Diode peak Reverse Recovery Current	I <sub>F</sub> =75A dI <sub>F</sub> /dt=300A/us	---	14.6	---	A
Q <sub>rr</sub>	Diode Reverse Recovery Charge	T <sub>C</sub> =25°C	---	1200	---	nC

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

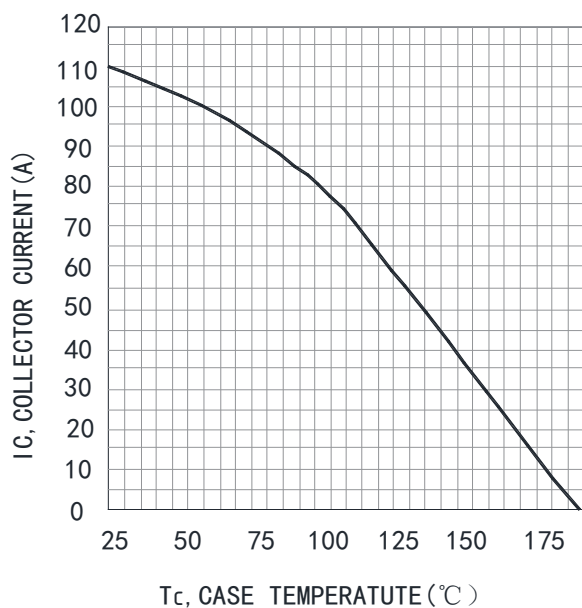
### Typical Characteristics



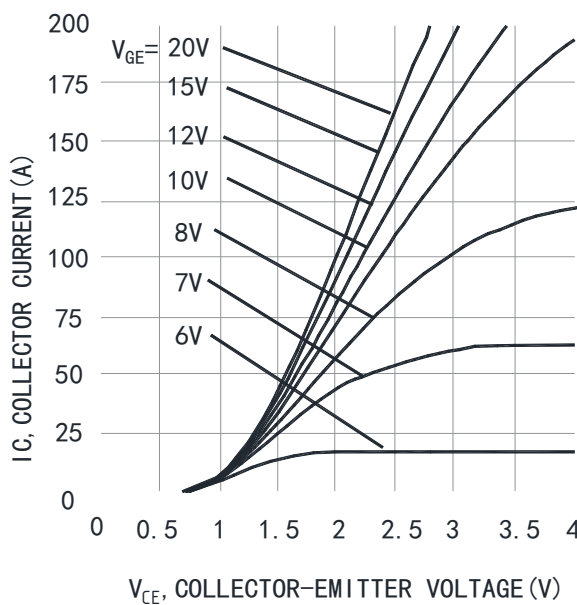
**Fig. 1 Forward bias safe operating area (D=0, T<sub>c</sub>=25°C, T<sub>vj</sub>≤175°C; V<sub>GE</sub>=15V. Recommended use at V<sub>GE</sub>≥7.5V)**



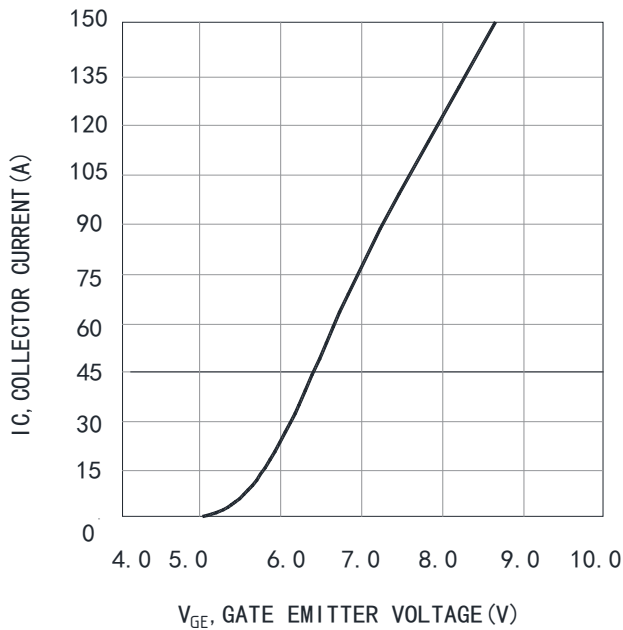
**Fig. 2 Power dissipation as a function of case temperature (T<sub>vj</sub>≤175°C)**



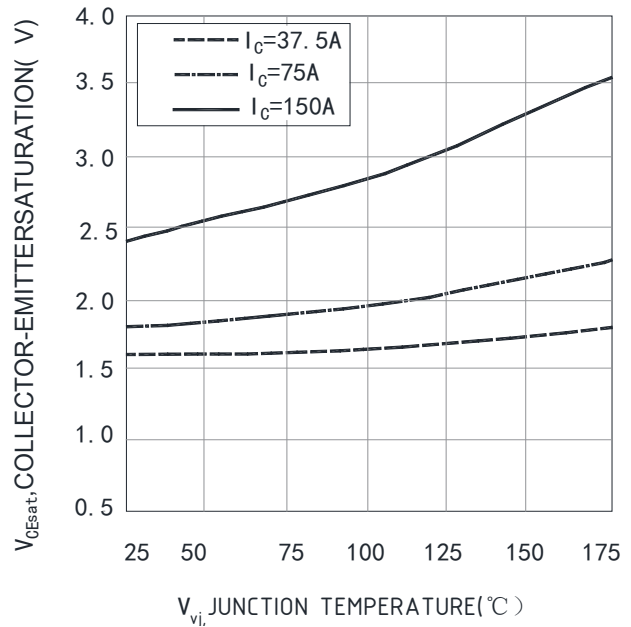
**Fig. 3 Collector current as a function of case temperature (V<sub>GE</sub>≥15V, T<sub>vj</sub>≤175°C)**



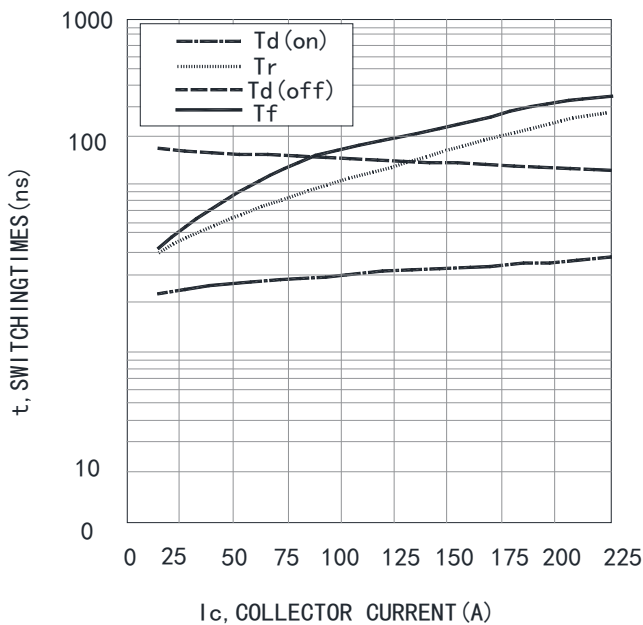
**Fig. 4 Typical output characteristic (T<sub>vj</sub>=25°C)**



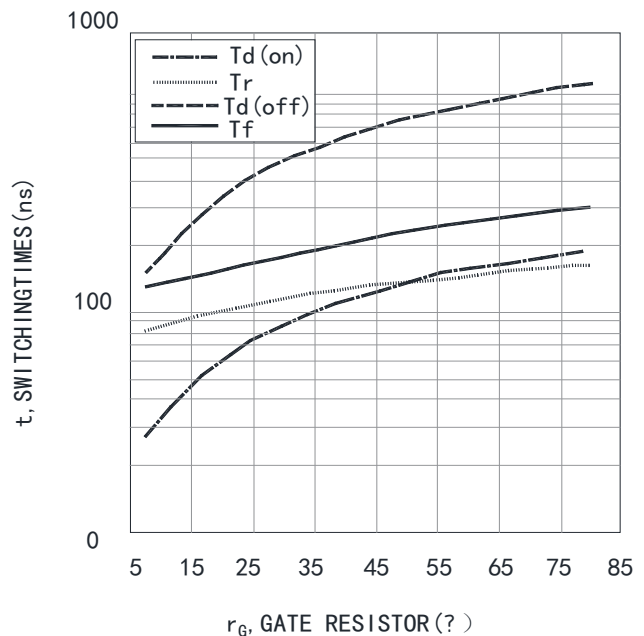
**Fig. 5 Typical transfer characteristics ( $V_{CE}=20V$ )**



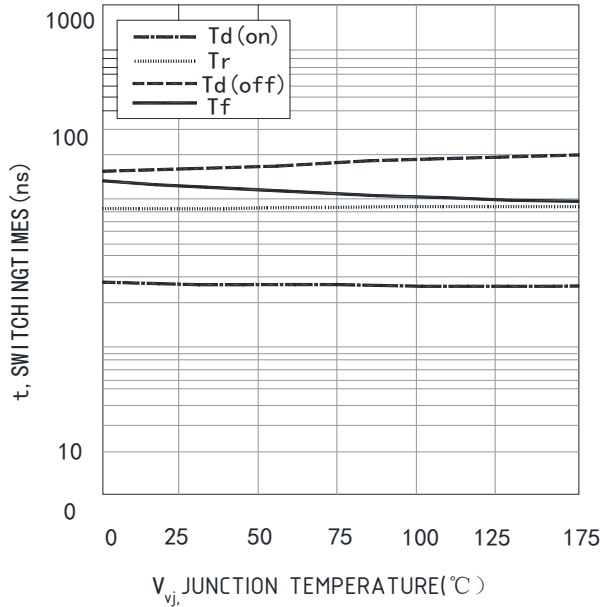
**Fig. 6 Typical collector-emitter saturation voltage as a function of junction temperature ( $V_{GE}=15V$ )**



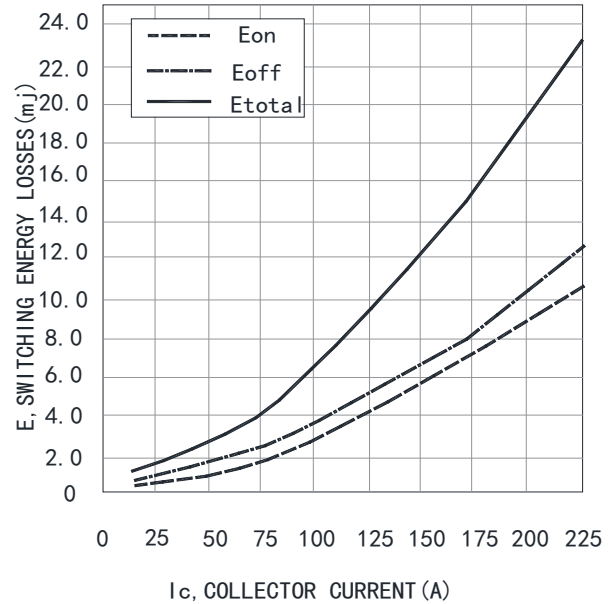
**Fig. 7 Typical switching times as a function of collector current (inductive load,  $T_{yj}=25^{\circ}C$ ,  $V_{CE}=400V$ ,  $V_{GE}=15/0V$ ,  $r_G=8\Omega$ )**



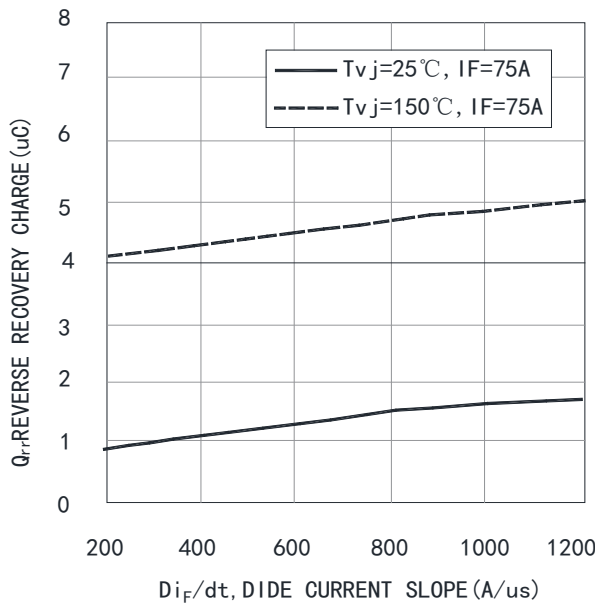
**Fig. 8 Typical switching times as a function of gate resistance (inductive load,  $T_{yj}=25^{\circ}C$ ,  $V_{CE}=400V$ ,  $V_{GE}=15/0V$ ,  $I_C=75A$ )**



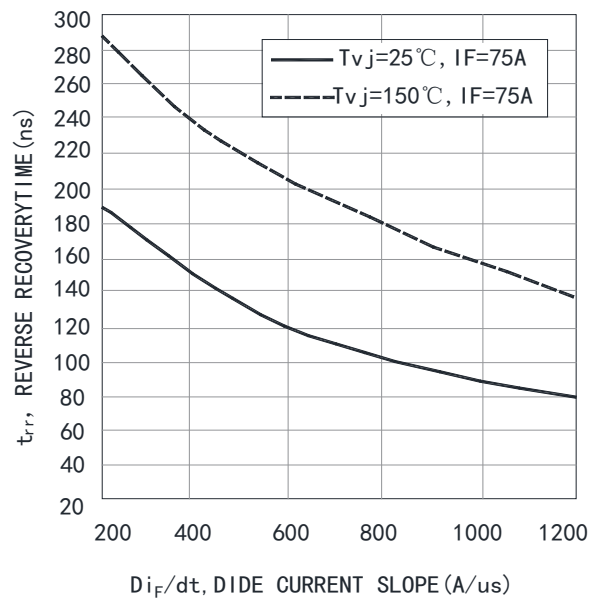
**Fig. 9 Typical switching times as a function of junction temperature (inductive load,  $V_{CE}=400V$ ,  $V_{GE}=15/0V$ ,  $I_c=75A$ ,  $r_G=8\Omega$ )**



**Fig. 10 Typical switching energy losses as a function of collector current (inductive load,  $T_{vj}=25^\circ C$ ,  $V_{CE}=400V$ ,  $V_{GE}=15/0V$ ,  $r_G=8\Omega$ )**

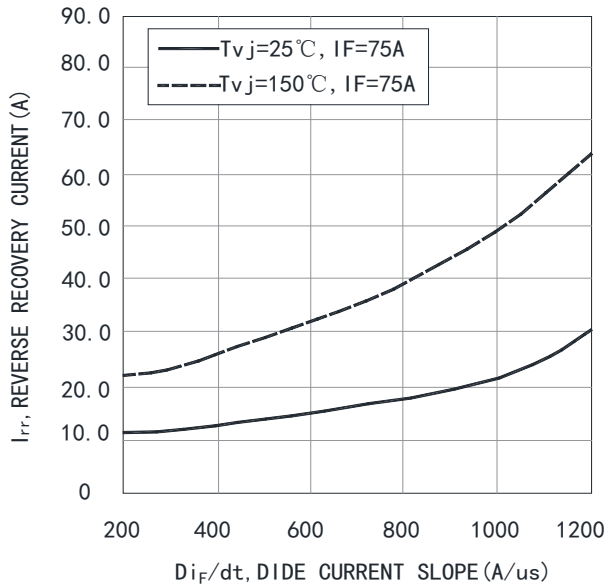


**Fig. 11 Typical reverse recovery charge as a function of diode current slope ( $V_R=400V$ )**

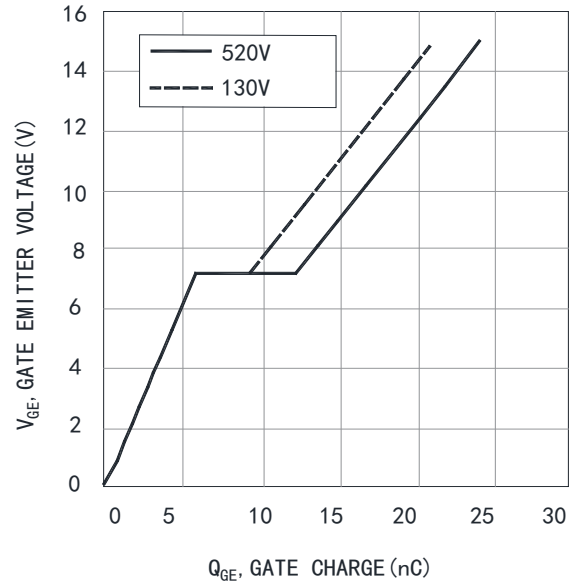


**Fig. 12 Typical reverse recovery time as a function of diode current slope ( $V_R=400V$ )**

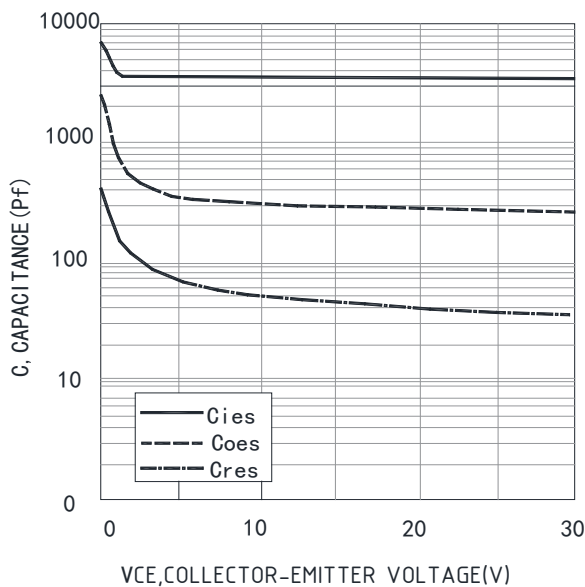




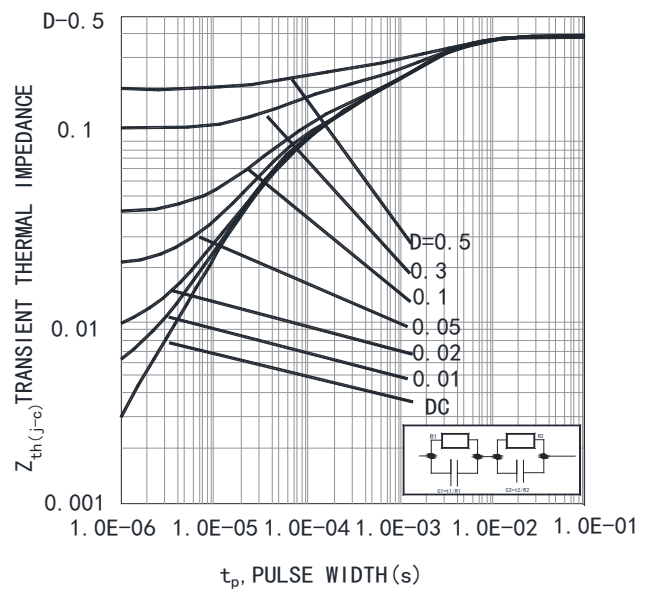
**Fig. 13 Typical reverse recovery current as a function of diode current slope ( $V_R=400V$ )**



**Fig. 14 Typical gate charge ( $I_C=75A$ )**



**Fig. 15 Typical capacitance as a function of collector-emitter voltage ( $V_{GE}=0V, f=1MHz$ )**



**Fig. 16 IGBT transient thermal impedance ( $D=t_p/T$ )**



# Trench Field-Stop Technology IGBT

LD075A060H247P3-S63

REV:A / 0

● **PART NO. SYSTEM :**

L D 015A 120 H 247 P3 -XXX

