

## » Applications

- Industrial UPS
- Industrial SMPS
- Solar converters
- Energy Storage
- Mid to high range switching frequency converters

## » Features

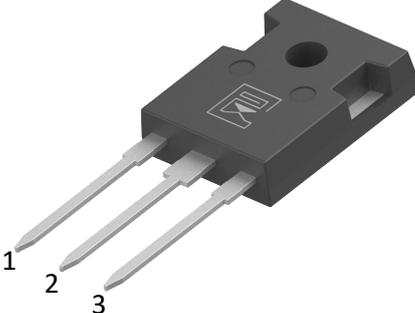
- Low switching power loss
- Low switching surge and noise
- Advanced Fieldstop technology
- Short circuit withstand time –10uS
- Maximum junction temperature 150°C
- Qualified according to JEDEC for target applications

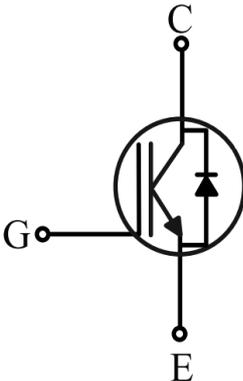
## » Product Summary

$V_{CES}$	650	V
$I_C$	75	A
$V_{CE(sat), Typ@15V}$	1.6	V



### TO-247L





Gate: 1  
Collector: 2  
Emitter: 3

## » Package Marking and Ordering Information

Ordering code	Marking	Package	Packaging	Min. package quantity
MSLB75N065T3H	MSLB75N065T3H	TO-247L	Tube	450

**» Absolute Maximum Ratings (Tc=25°C unless otherwise noted)**

Parameter	Symbol	Ratings	Unit
Collector-emitter Voltage	$V_{CES}$	650	V
DC collector current, limited by $T_{jmax}$ TC=25°C TC=100°C	$I_C$	150 75	A
Pulsed collector current, $t_p$ limited by $T_{jmax}$	$I_{C\ Pulse}$	300	A
Diode forward current, limited by $T_{jmax}$ TC=25°C TC=100°C	$I_F$	150 75	A
Diode Pulsed current, $t_p$ limited by $T_{jmax}$	$I_{F\ Pulse}$	280	A
Continuous Gate-emitter voltage	$V_{GE}$	±20	V
Short circuit withstand time $V_{GE}=15V, V_{CC} \leq 400V, T_j \leq 150^\circ C$	$t_{SC}$	10	µs
Power Dissipation (TC=25°C)	$P_D$	416	W
Junction Temperature	$T_j$	150	°C
Storage Temperature	$T_{STG}$	-55-150	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

**» Thermal Characteristics**

Parameter	Symbol	Max	Unit
IGBT Maximum Junction-to-Case	$R_{\theta JC}$	0.3	°C/W
Diode Maximum Junction-to-Case	$R_{\theta JC}$	0.4	°C/W
Maximum Junction-to-Ambient	$R_{\theta JA}$	40	°C/W

Note: This transistor is sensitive to electrostatic discharge and should be handled with care.

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Collector-emitter Breakdown Voltage	$BV_{CES}$	$V_{GE}=0V, I_C=250\mu A$	650	-	-	V
Zero gate voltage collector current	$I_{CES}$	$V_{CE}=650V, V_{GE}=0V$	-	-	100	$\mu A$
Gate-emitter leakage current	$I_{GES}$	$V_{GE}=\pm 20V, V_{CE}=0V$	-	-	$\pm 400$	nA
Gate-emitter threshold voltage	$V_{GE(TH)}$	$V_{CE}=V_{GE}, I_C=250\mu A$	4.0	5.2	6.0	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=75A$	-	1.6	1.9	V
		$T_j=125^\circ C$	-	1.9	-	V
Diode forward voltage	$V_F$	$I_F=75A$	-	2.2	2.7	V
		$T_j=150^\circ C$	-	1.8	-	V
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{ies}$	$V_{CE}=25V, V_{GE}=0V, f=1.0MHz$	-	3884	-	pF
Output Capacitance	$C_{oes}$		-	267	-	pF
Reverse Transfer Capacitance	$C_{res}$		-	67	-	pF
Integrated gate resistor	$R_{Gint}$		-	1.4	-	$\Omega$
Total Gate Charge	$Q_g$	$V_{CC}=400V, I_C=75A, V_{GE}=15V$	-	180	-	nC
Gate-to-emitter charge	$Q_{ge}$		-	41	-	nC
Gate-to-collector charge	$Q_{gc}$		-	78	-	nC
Internal emitter inductance measured 5mm (0.197 in.) from case	$L_E$		-	13	-	nH



Switching Characteristic, Inductive Load, at  $T_j=25^\circ\text{C}$

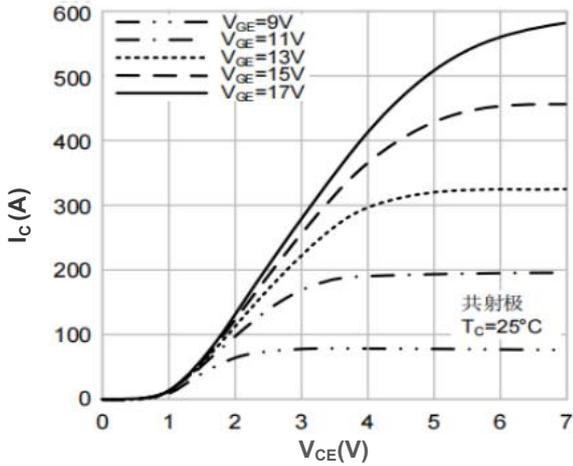
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>IGBT Switching Characteristics</b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{CC}= 400V$ $I_C= 75A$ $V_{GE}= 15V$ $R_G= 10\Omega$ Inductive load	-	55	-	ns
Turn-On Rise Time	$t_r$		-	40	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	208	-	ns
Turn-Off Fall Time	$t_f$		-	89	-	ns
Turn-on energy	$E_{on}$		-	1.05	-	mJ
Turn-off energy	$E_{off}$		-	1.72	-	mJ
<b>Diode Characteristics</b>						
Reverse Recovery Time	$t_{rr}$	$V_R=400V, I_F=30A,$ $di/dt=200A/us$	-	52	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	0.21	-	$\mu\text{C}$
Peak Reverse Recovery Current	$I_{rrm}$		-	8.2	-	A

Switching Characteristic, Inductive Load, at  $T_j=150^\circ\text{C}$

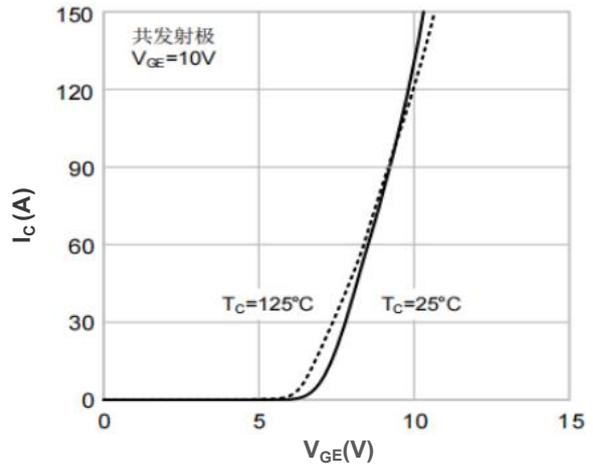
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>IGBT Switching Characteristics</b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{CC}= 400V$ $I_C= 75A$ $V_{GE}= 15V$ $R_G= 10\Omega$ Inductive load	-	50	-	ns
Turn-On Rise Time	$t_r$		-	41	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	230	-	ns
Turn-Off Fall Time	$t_f$		-	115	-	ns
Turn-on energy	$E_{on}$		-	1.3	-	mJ
Turn-off energy	$E_{off}$		-	2.5	-	mJ
<b>Diode Characteristics</b>						
Reverse Recovery Time	$t_{rr}$	$V_R=400V, I_F=30A,$ $di/dt=200A/us$	-	86	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	0.55	-	$\mu\text{C}$
Peak Reverse Recovery Current	$I_{rrm}$		-	12.8	-	A



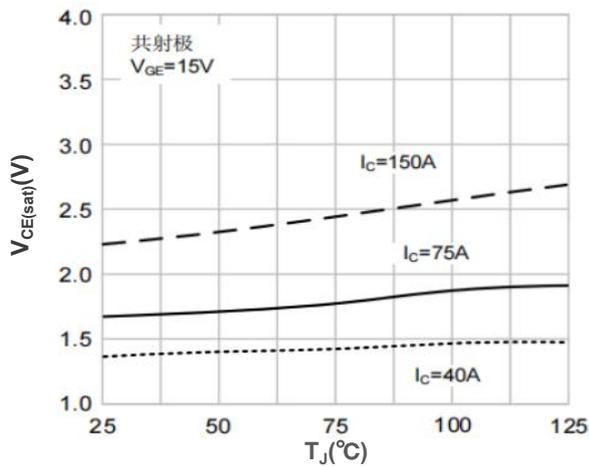
Characteristics Curves



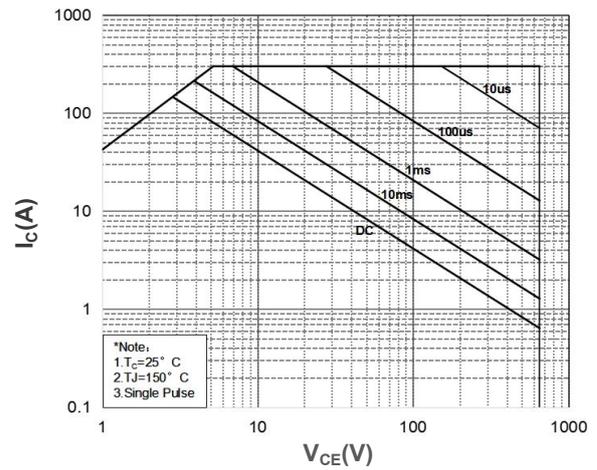
Output Characteristics



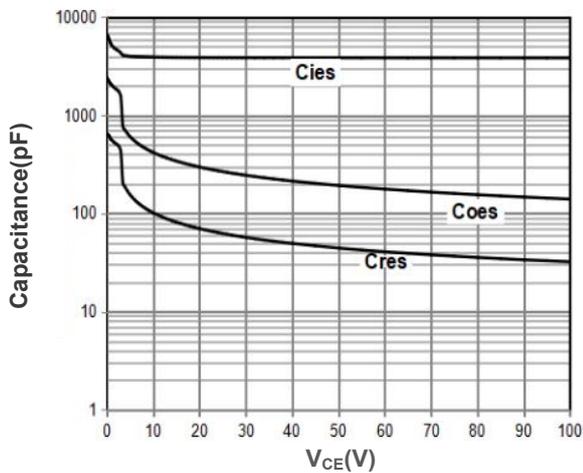
Transfer Characteristics



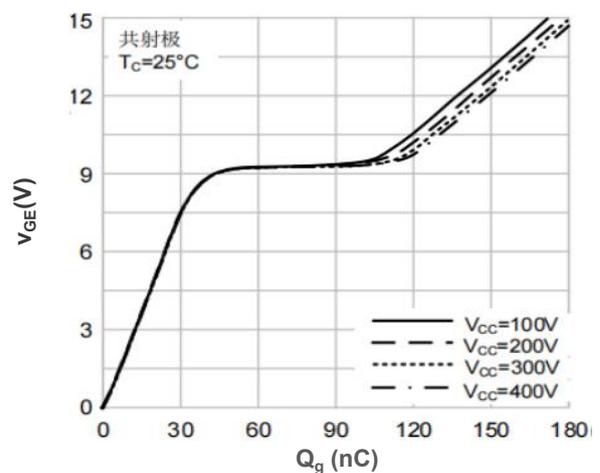
"Typical collector-emitter saturation voltage as a function of junction temperature"



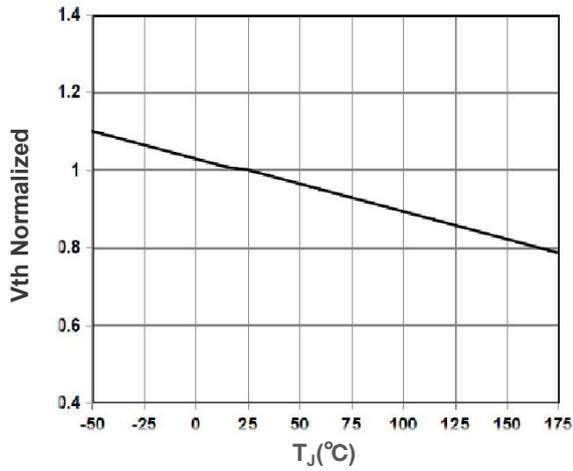
Maximum Safe Operating Area



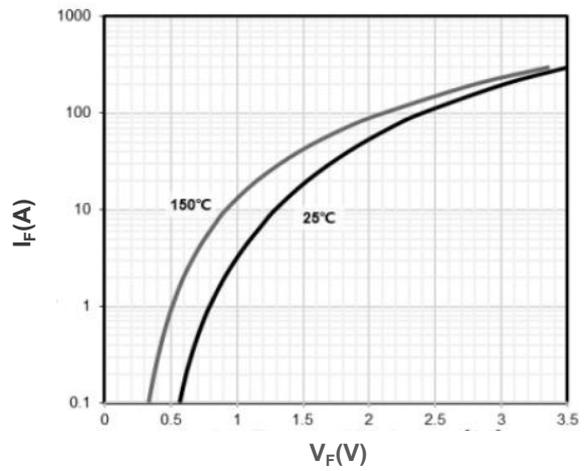
Capacitance



Typical gate charge



Gate-emitter threshold voltage as a function of junction temperature



Typ. diode forward current as a function of forward voltage

Note : The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



TO-247L Package Dimensions

Unit: mm

Symbol	Min	Nom	Max	Symbol	Min	Nom	Max
A1	2.20	2.40	2.60	E2	5.00		5.50
A2	1.85		2.15	E3	1.90		2.60
b	1.07		1.33	e		5.44	
b2	1.90		2.16	L	19.30		19.90
b4	2.90		3.20	L1	3.95	4.15	4.35
c	0.52		0.68	ΦP	3.40		3.80
D	20.70	20.80	21.30	ΦP1	7.00		7.40
D1	16.15		16.95	S	6.04	6.15	6.30
E	15.50	15.60	16.10				

