

MSAHX75L60C

600 Volts
75 Amps
2.7 Volts vce(sat)

N-CHANNEL
INSULATED GATE
BIPOLAR TRANSISTOR

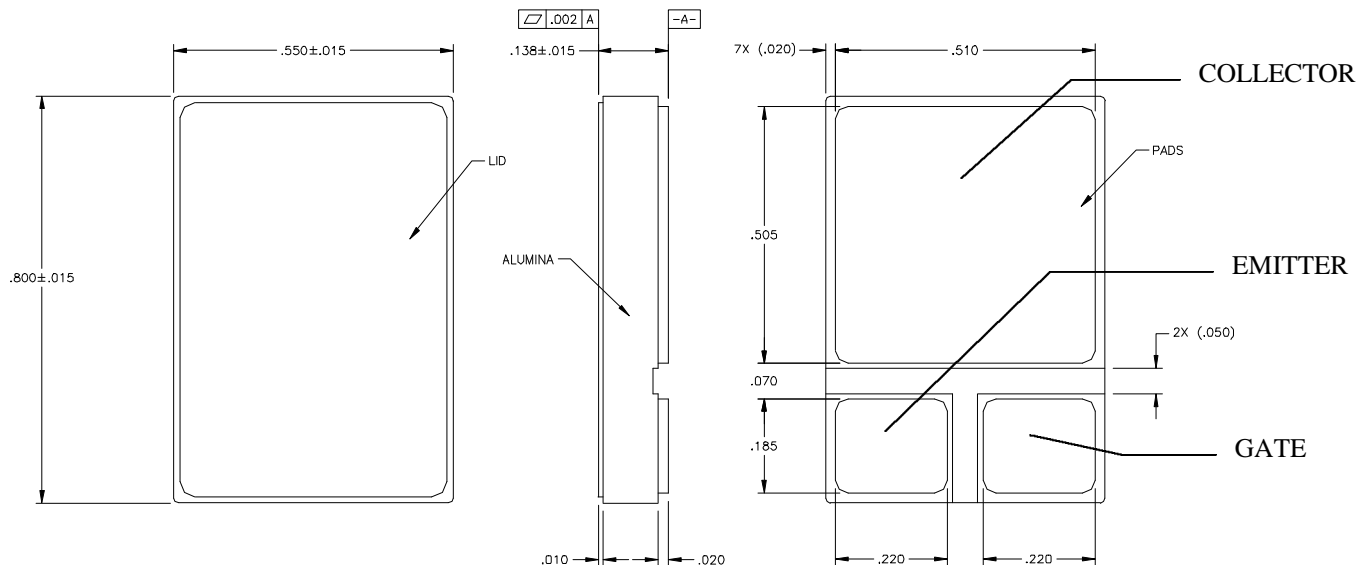
Features

- Rugged polysilicon gate cell structure
- high current handling capability, latch-proof
- Hermetically sealed, surface mount power package
- Low package inductance
- Very low thermal resistance
- Reverse polarity available upon request: MSAHX75L60D
- low VCE(sat) IGBT, low conduction losses

Maximum Ratings @ 25°C (unless otherwise specified)

DESCRIPTION	SYMBOL	MAX.	UNIT
Collector-to-Emitter Breakdown Voltage (Gate Shorted to Emitter) @ T _J ≥ 25°C	BV _{CES}	600	Volts
Collector-to-Gate Breakdown Voltage @ T _J ≥ 25°C, R _{GS} = 1 MΩ	BV _{CGR}	600	Volts
Continuous Gate-to-Emitter Voltage	V _{GES}	+/-20	Volts
Transient Gate-to-Emitter Voltage	V _{GEM}	+/-30	Volts
Continuous Collector Current T _J = 25°C T _J = 90°C	I _{C25} I _{C90}	75 60	Amps
Peak Collector Current, pulse width limited by T _{Jmax}	I _{CM}	200	Amps
Safe Operating Area (RBSOA) @ V _{GE} = 15V, L= 30μH (clamped inductive load), R _G = 2.7Ω, T _J = 125°C, V _{CE} = 0.8 x V _{CES}	I _{max}	100	Amps
Power Dissipation	P _D	300	Watts
Junction Temperature Range	T _J	-55 to +150	°C
Storage Temperature Range	T _{stg}	-55 to +150	°C
Thermal Resistance, Junction to Case	θ _{JC}	0.25	°C/W

Mechanical Outline



MSAHX75L60C

Electrical Parameters @ 25°C (unless otherwise specified)

DESCRIPTION	SYMBOL	CONDITIONS	MIN	TYP.	MAX	UNIT
Collector-to-Emitter Breakdown Voltage (Gate Shorted to Emitter)	BV_{CES}	$V_{GS} = 0\text{ V}, I_C = 250\ \mu\text{A}$	600			V
Gate Threshold Voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}, I_C = 250\ \mu\text{A}$	2.5		5.0	V
Gate-to-Emitter Leakage Current	I_{GES}	$V_{GE} = \pm 20V_{DC}, V_{CE} = 0$ $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$			± 100 ± 200	nA
Collector-to-Emitter Leakage Current (Zero Gate Voltage Collector Current)	I_{CES}	$V_{CE} = 0.8 \cdot BV_{CES}$ $V_{GE} = 0\text{ V}$ $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$			200 1000	μA
Collector-to-Emitter Saturation Voltage (1)	$V_{CE(sat)}$	$V_{GE} = 15\text{ V}, I_C = 60\text{ A}$ $I_C = 60\text{ A}$ $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$		1.8	1.8	V
Forward Transconductance (1)	g_{fs}	$V_{CE} \geq 10\text{ V}; I_C = 60\text{ A}$	30	40		S
Input Capacitance	C_{ies}	$V_{GE} = 0\text{ V}, V_{CE} = 25\text{ V}, f = 1\text{ MHz}$		4000		pF
Output Capacitance	C_{oes}			340		
Reverse Transfer Capacitance	C_{res}			100		
INDUCTIVE LOAD, $T_J = 25^\circ\text{C}$		$V_{GE} = 15\text{ V}, V_{CE} = 480\text{ V},$ $I_C = 60\text{ A}, R_G = 2.7\ \Omega,$ $L = 100\ \mu\text{H}$ note 2, 3				
Turn-on Delay Time	$t_{d(on)}$			50		ns
Rise Time	t_{ri}			210		ns
Turn-off Delay Time	$t_{d(off)}$			600	800	ns
Fall Time	t_{fi}			500	700	ns
Off Energy	E_{off}			16		mJ
INDUCTIVE LOAD, $T_J = 125^\circ\text{C}$		$V_{GE} = 15\text{ V}, V_{CE} = 480\text{ V},$ $I_C = 60\text{ A}, R_G = 2.7\ \Omega,$ $L = 100\ \mu\text{H}$ note 2, 3				
Turn-on Delay Time	$t_{d(on)}$			50		ns
Rise Time	t_{ri}			240		ns
On Energy	E_{on}			3		mJ
Turn-off Delay Time	$t_{d(off)}$			1000		ns
Fall Time	t_{fi}			1000		ns
Off Energy	E_{off}		26		mJ	
Total Gate Charge	Q_g	$V_{GE} = 15\text{ V}, V_{CE} = 300\text{ V}, I_C = 50\text{ A}$		200	250	nC
Gate-to-Emitter Charge	Q_{ge}			35	50	
Gate-to-Collector (Miller) Charge	Q_{gc}			80	100	

Notes

- (1) Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\delta \leq 2\%$
- (2) switching times and losses may increase for larger V_{CE} and/or R_G values or higher junction temperatures.
- (3) switching losses include "tail" losses
- (4) Microsemi Corp. does not manufacture the igbt die; contact company for details.