AMERICAN MICROSEMICONDUCTOR

AMS400GAS12

Features

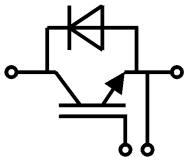
- V-IGBT = 6. Generation Trench V-IGBT
- Increased power cycling capability
- With integrated gate resistor
- Low switching losses at high di/dt

Typical Applications

- AC inverter drives
- UPS
- Electronic welders
- Switched reluctance motor

Remarks

- Case temperature limited to T_c = 125°C max, recomm. T_{op} = -40 ... +150°C, product rel. results valid for T_j = 150°



Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
IGBT				
V_{CES}	T_j = 25 °C		1200	V
I_C	T_j = 175 °C	T_c = 25 °C	612	A
		T_c = 80 °C	467	A
I_{Cnom}			400	A
I_{CRM}	I_{CRM} = 3xI_{Cnom}		1200	A
V_{GES}			-20 ... 20	V
t_{psc}	V_{CC} = 720 V V_{GE} ≤ 15 V V_{CES} ≤ 1200 V	T_j = 125 °C	10	µs
T_j			-40 ... 175	°C
Inverse diode				
I_F	T_j = 175 °C	T_c = 25 °C	440	A
		T_c = 80 °C	329	A
I_{Fnom}			400	A
I_{FRM}	I_{FRM} = 3xI_{Fnom}		1200	A
I_{FSM}	t_p = 10 ms, sin 180°, T_j = 25 °C		1980	A
T_j			-40 ... 175	°C
Module				
$I_{t(RMS)}$	$T_{terminal}$ = 80 °C		500	A
T_{stg}			-40 ... 125	°C
V_{isol}	AC sinus 50 Hz, t = 1 min		4000	V

Characteristics

Symbol	Conditions		min.	typ.	max.	Unit
IGBT						
$V_{CE(sat)}$	I_C = 400 A V_{GE} = 15 V chiplevel	T_j = 25 °C		1.75	2.20	V
		T_j = 150 °C		2.20	2.50	V
V_{CE0}	chiplevel	T_j = 25 °C		0.94	1.04	V
		T_j = 150 °C		0.88	0.98	V
r_{CE}	V_{GE} = 15 V chiplevel	T_j = 25 °C		2.02	2.90	m
		T_j = 150 °C		3.30	3.80	m
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 16 mA		5.5	6	6.5	V
I_{CES}	V_{GE} = 0 V V_{CE} = 1200 V	T_j = 25 °C		0.1	0.3	mA
		T_j = 150 °C				mA
C_{ies}	V_{CE} = 25 V V_{GE} = 0 V	f = 1 MHz		24.04		nF
C_{oes}		f = 1 MHz		2.36		nF
C_{res}		f = 1 MHz		2.356		nF
Q_G	V_{GE} = - 8 V...+ 15 V			4420		nC
R_{Gint}				1.88		
$t_{d(on)}$	V_{CC} = 600 V I_C = 400 A V_{GE} = ±15 V $R_{G\,on}$ = 3 $R_{G\,off}$ = 3 di/dt_{on} = 9800 A/µs di/dt_{off} = 5000 A/µs du/dt_{off} = 7600 V/µs	T_j = 150 °C		350		ns
t_r		T_j = 150 °C		60		ns
E_{on}		T_j = 150 °C		39		mJ
$t_{d(off)}$		T_j = 150 °C		700		ns
t_f		T_j = 150 °C		65		ns
E_{off}		T_j = 150 °C		42		mJ
$R_{th(j-c)}$	per IGBT				0.072	K/W

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- Isolated copper baseplate using DBC technology (Direct Copper Bonding)
- Increased power cycling capability
- With integrated gate resistor
- Low switching losses at high di/dt

Typical Applications

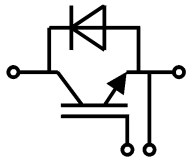
- AC inverter drives
- UPS
- Electronic welders
- Switched reluctance motor

Remarks

- Case temperature limited to T_c = 125°C max, recomm. T_{op} = -40 ... +150°C, product rel. results valid for T_j = 150°

Characteristics

Symbol	Conditions		min.	typ.	max.	Unit
Inverse diode						
$V_F = V_{EC}$	I_F = 400 A V_{GE} = 0 V chiplevel	T_j = 25 °C		2.20	2.52	V
		T_j = 150 °C		2.15	2.47	V
V_{F0}	chiplevel	T_j = 25 °C		1.3	1.5	V
		T_j = 150 °C		0.9	1.1	V
r_F	chiplevel	T_j = 25 °C		2.3	2.5	m
		T_j = 150 °C		3.1	3.4	m
I_{RRM}	I_F = 400 A di/dt_{off} = 9500 A/µs V_{GE} = ±15 V V_{CC} = 600 V	T_j = 150 °C		450		A
Q_{rr}		T_j = 150 °C		58		µC
E_{rr}		T_j = 150 °C		26		mJ
$R_{th(j-c)}$	per diode				0.14	K/W
Module						
L_{CE}				15	20	nH
$R_{CC'+EE'}$	terminal-chip	T_C = 25 °C		0.18		m
		T_C = 125 °C		0.22		m
$R_{th(c-s)}$	per module			0.02	0.038	K/W
M_s	to heat sink M6		3		5	Nm
M_t	to terminals	M6	2.5		5	Nm
		M4	1.1		2	Nm
w					330	g



GAS CONFIGURATION