

## Econo Dual module with trench FS IGBT

### FEATURES

- High efficiency
- Low stray inductance design
- Optimized for fast switching
- Maximum junction temperature 175°C
- RoHS compliant

AS-Econo

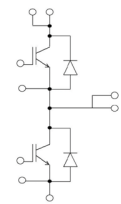


RoHS  
COMPLIANT

HALOGEN  
FREE  
AVAILABLE

### MECHANICAL DATA

- Case: AS-Econo
- Case material: UL flammability classification rating 94V-0



### MAXIMUM RATINGS, IGBT

$T_{vj}=25^{\circ}\text{C}$  unless otherwise noted

Parameter	Symbol	Value	Unit
Collector-emitter Voltage@ $T_{vj} = 25^{\circ}\text{C}$	$V_{CES}$	1700	V
Continuous Collector Current @ $T_C=100^{\circ}\text{C}, T_{vj\text{ max}} = 175^{\circ}\text{C}$	$I_C$	300	A
Pulsed Collector Current, $t_p = 1\text{ms}$	$I_{CRM}$	600	A
Power Dissipation @ $T_C=25^{\circ}\text{C}, T_{vj\text{ max}} = 175^{\circ}\text{C}$	$P_{tot}$	2205	W
Gate-emitter Peak Voltage	$V_{GES}$	$\pm 20$	V
Temperature Under Switching Conditions	$T_{vjop}$	-40 to +150	$^{\circ}\text{C}$

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**CHARACTERISTICS, IGBT**
 $T_{vj}=25^{\circ}\text{C}$  unless otherwise noted

Parameter	Test Conditions	Symbol	Value			Unit
			Min.	Nom.	Max.	
Collector-emitter Saturation Voltage	$V_{GE}=15\text{V}$ , $I_C=300\text{A}$ , $T_{vj}=25^{\circ}\text{C}$	$V_{CE(sat)}$	-	2.2	-	V
	$V_{GE}=15\text{V}$ , $I_C=300\text{A}$ , $T_{vj}=150^{\circ}\text{C}$		-	2.7	-	
Gate Threshold Voltage	$V_{GE}=V_{CE}$ , $I_C=12\text{mA}$ ,	$V_{GE(th)}$	4.6	5.6	6.6	V
Collector-emitter Leakage Current	$V_{CE}=1700\text{V}$ , $V_{GE}=0\text{V}$	$I_{CES}$	-	-	1.0	mA
Gate Leakage Current	$V_{GE}=\pm 20\text{V}$ , $V_{CE}=0\text{V}$	$I_{GES}$	-	-	$\pm 400$	nA
Input Capacitance	$V_{CE}=25\text{V}$ , $V_{GE}=0\text{V}$ $f=1\text{MHz}$	$C_{ies}$	-	28.5	-	nF
Reverse Transfer Capacitance		$C_{res}$	-	0.76	-	
Internal Gate Resistor		$R_{Gint}$	-	3.0	-	$\Omega$
Turn-on Delay Time	$V_{CC}=900\text{V}$ , $V_{GE}=-15/15\text{V}$ , $I_C=300\text{A}$ , $R_G=3.3\Omega$ , Inductive load $T_{vj}=25^{\circ}\text{C}$	$t_{d(on)}$	-	208	-	ns
Rise Time		$t_r$	-	108	-	
Turn-off Delay Time		$t_{d(off)}$	-	632	-	
Fall Time		$t_f$	-	240	-	
Turn-on Energy		$E_{on}$	-	69.2	-	mJ
Turn-off Energy		$E_{off}$	-	48.5	-	
Turn-on Delay Time	$V_{CC}=900\text{V}$ , $V_{GE}=-15/15\text{V}$ , $I_C=300\text{A}$ , $R_G=3.3\Omega$ , Inductive load $T_{vj}=150^{\circ}\text{C}$	$t_{d(on)}$	-	215	-	ns
Rise Time		$t_r$	-	131	-	
Turn-off Delay Time		$t_{d(off)}$	-	710	-	
Fall Time		$t_f$	-	450	-	
Turn-on Energy		$E_{on}$	-	111	-	mJ
Turn-off Energy		$E_{off}$	-	73.8	-	
Short Circuit Withstand Time	$V_{CC}=900\text{V}$ , $V_{GE}\leq 15\text{V}$	$t_{sc}$	-	10	-	$\mu\text{s}$
Thermal Resistance, junction to case		$R_{th(j-c)}$	-	0.068	-	K/W

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**MAXIMUM RATINGS, Diode**
 $T_{vj}=25^{\circ}\text{C}$  unless otherwise noted

Parameter	Test Conditions	Symbol	Value	Unit
Repetitive Peak Reverse Voltage	$T_{vj}=25^{\circ}\text{C}$	$V_{RRM}$	1700	V
Continuous DC Forward Current	$T_C=100^{\circ}\text{C}$	$I_F$	300	A
Repetitive Peak Forward Current	$t_p=1\text{ ms}$	$I_{FRM}$	600	A

**CHARACTERISTICS, Diode**
 $T_{vj}=25^{\circ}\text{C}$  unless otherwise noted

Parameter	Test Condition	Symbol	Value			Unit
			Min.	Nom.	Max.	
Diode Forward Voltage	$I_F=300\text{A}, V_{GE}=0\text{ V}, T_{vj}=25^{\circ}\text{C}$	$V_F$	-	1.8	-	V
	$I_F=300\text{A}, V_{GE}=0\text{ V}, T_{vj}=150^{\circ}\text{C}$		-	1.9	-	
Peak Reverse Recovery Current	$I_F=300\text{A}, V_R=900\text{V}, V_{GE}=-15\text{V}, T_{vj}=25^{\circ}\text{C}$	$I_{RR}$	-	345	-	A
Recovered Charge		$Q_{RR}$	-	50.4	-	$\mu\text{C}$
Reverse Recovery Energy		$E_{rec}$	-	31.6	-	mJ
Peak Reverse Recovery Current	$I_F=300\text{A}, V_R=900\text{V}, V_{GE}=-15\text{V}, T_{vj}=150^{\circ}\text{C}$	$I_{RR}$	-	288	-	A
Recovered Charge		$Q_{RR}$	-	95.8	-	$\mu\text{C}$
Reverse Recovery Energy		$E_{rec}$	-	56.2	-	mJ
Thermal Resistance, junction to case		$R_{th(j-c)}$	-	0.14	-	K/ W

**CHARACTERISTICS, Module**
 $T_{vj}=25^{\circ}\text{C}$  unless otherwise noted

Parameter	Test Condition	Symbol	Value			Unit
			Min.	Nom.	Max.	
Isolation Test Voltage	RMS, $f=50\text{Hz}, t=1\text{ min.}$	$V_{ISOL}$	4	-	-	kW
Mounting Torque	Mounting Screw:M6	M	-	4.0	6.0	K/ W
Weight		G	-	350	-	g
Storage Temperature Range		$T_{stg}$	-40 to +150			K/ W
Temperature Under Switching Conditions		$T_{vjop}$	-40 to +150			K/ W

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### RATINGS AND CHARACTERISTIC CURVES

$$I_C = f(V_{CE})$$

$$V_{GE} = 15V$$

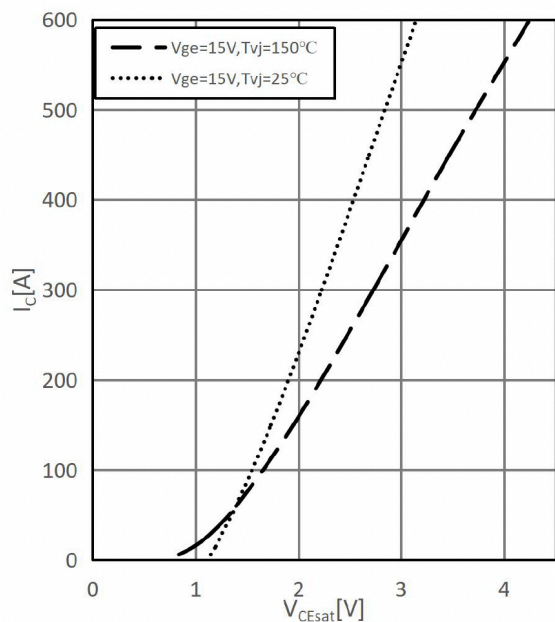


Fig 1. Output characteristic, IGBT

$$I_C = f(V_{CE})$$

$$T_{vj} = 150^\circ C$$

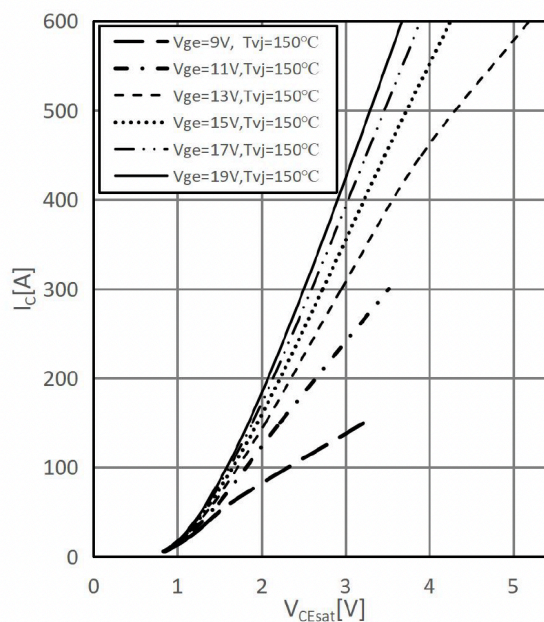


Fig 2. Output characteristic, IGBT

$$I_C = f(V_{CE})$$

$$V_{CE} = 20V$$

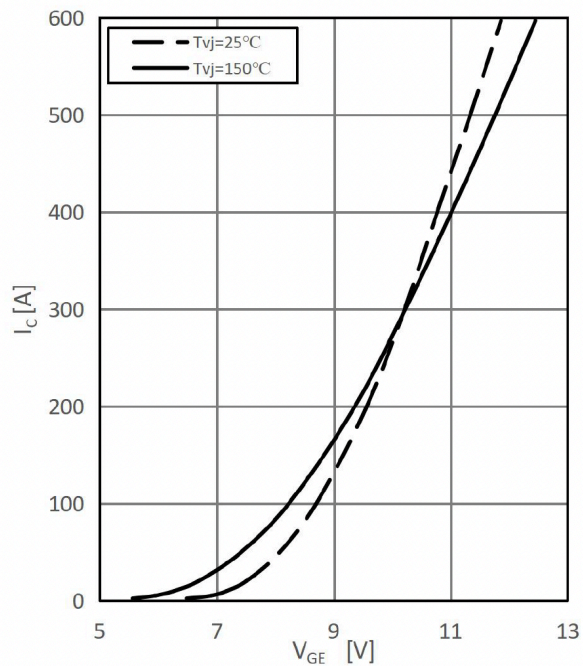


Fig 3. Transfer characteristic, IGBT

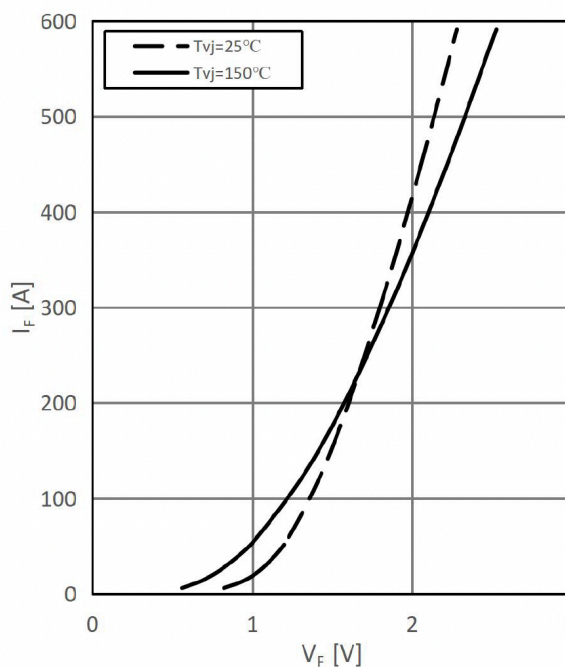


Fig 4. Forward characteristic, Diode

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### RATINGS AND CHARACTERISTIC CURVES

$$E_{on}=f(R_G), E_{off}=f(R_G), E_{rec}=f(R_G)$$

$V_{GE}=\pm 15V, I_C=300A, V_{CE}=900V, T_{vj}=150^\circ C$

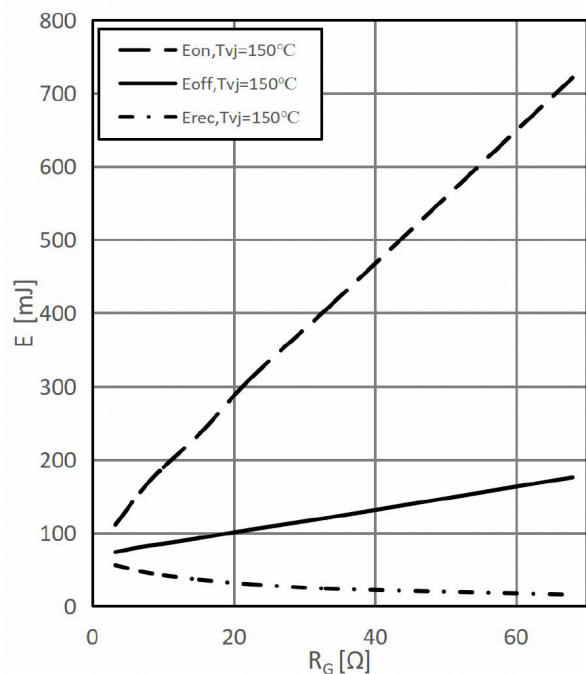


Fig 5. Switching losses

$$E_{on}=f(I_C), E_{off}=f(I_C), E_{rec}=f(I_C)$$

$V_{GE}=\pm 15V, R_G=3.3\Omega, V_{CE}=900V, T_{vj}=150^\circ C$

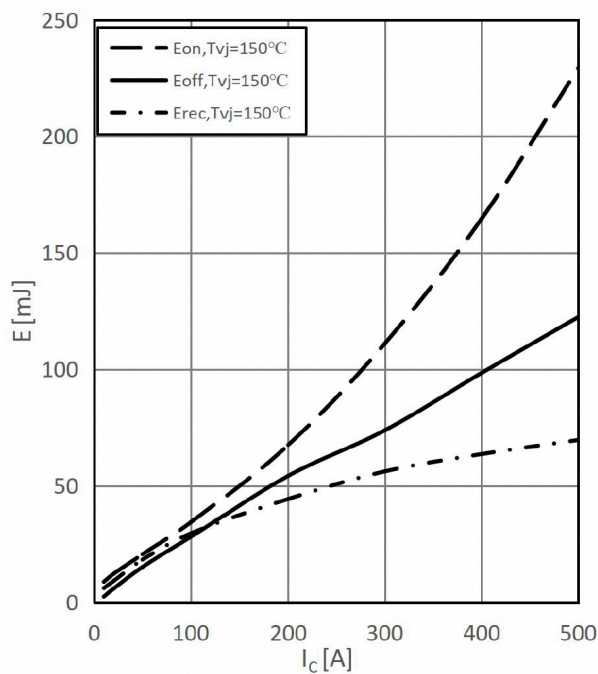


Fig 6. Switching losses

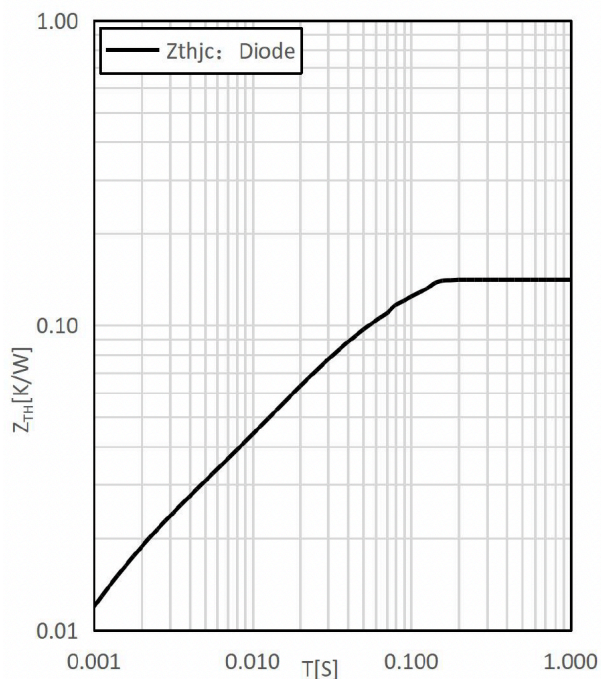


Fig 7. Transient thermal impedance, IGBT

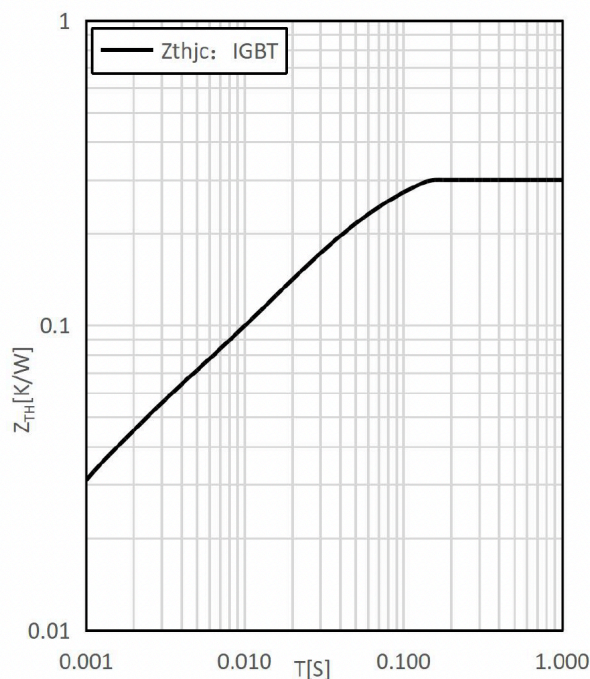
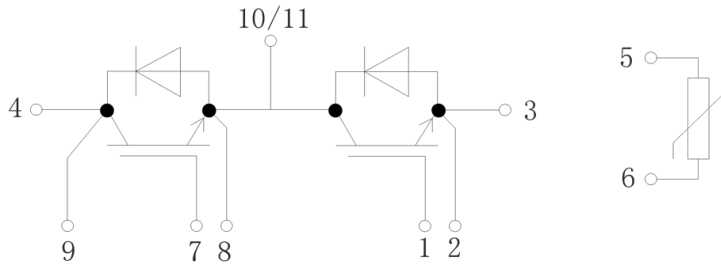


Fig 8. Transient thermal impedance, Diode

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### PACKAGE OUTLINE DIMENSIONS



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