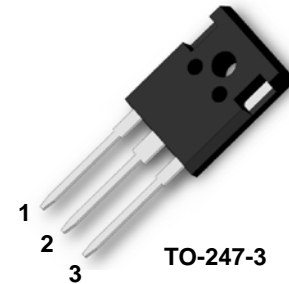


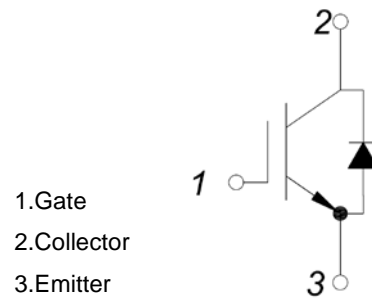
## FEATURES

- ☐ Low switching losses
- ☐ Low EMI
- ☐ Fast switching and short tail current
- ☐ Free wheeling diodes with fast and soft reverse recovery
- ☐  $V_{CE(sat)}$  with positive temperature coefficient



## APPLICATIONS

- ☐ High frequency switching application
- ☐ Medical applications
- ☐ Motion/servo control
- ☐ UPS systems



## ABSOLUTE MAXIMUM RATINGS

 $T_C=25^{\circ}\text{C}$  unless otherwise specified

Symbol	Parameter	Test Conditions	Values	Unit
<b>IGBT</b>				
$V_{CES}$	Collector - Emitter Voltage	$T_J=25^{\circ}\text{C}$	1200	V
$V_{GES}$	Gate - Emitter Voltage		$\pm 20$	V
$I_C$	DC Collector Current	$T_C=25^{\circ}\text{C}$	40	A
		$T_C=100^{\circ}\text{C}$	30	A
$I_{Cpuls}$	Pulsed collector current, tp limited by $T_{Jmax}$		80	A
$P_{tot}$	Power Dissipation		270	W
<b>Anti-Parallel Diode</b>				
$V_{RRM}$	Repetitive Reverse Voltage	$T_J=25^{\circ}\text{C}$	1200	V
$I_{F(AV)}$	Average Forward Current	$T_C=25^{\circ}\text{C}$	10	A
$I_{Fpuls}$	Diode pulsed current, tp limited by $T_{Jmax}$		20	A
$T_{Jmax}$	Max. Junction Temperature		-40 to +150	$^{\circ}\text{C}$
$T_{jop}$	Operating Temperature		-40 to +150	$^{\circ}\text{C}$
$T_{stg}$	Storage Temperature		-55 to +125	$^{\circ}\text{C}$
Torque	Module-to-Sink	Recommended (M3)	1.1	N·m
Weight			8.0	g

**ELECTRICAL AND THERMAL CHARACTERISTICS**  $T_C=25^{\circ}\text{C}$  unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>IGBT</b>						
$V_{GE(th)}$	Gate - Emitter Threshold Voltage	$V_{CE}=V_{GE}$ , $I_C=1\text{mA}$	5	5.8	6.5	V
$V_{CE(sat)}$	Collector - Emitter Saturation Voltage	$I_C=30\text{A}$ , $V_{GE}=15\text{V}$ , $T_J=25^{\circ}\text{C}$		2.3	2.7	V
		$I_C=30\text{A}$ , $V_{GE}=15\text{V}$ , $T_J=125^{\circ}\text{C}$		2.7		V
$I_{CES}$	Collector Leakage Current	$V_{CE}=1200\text{V}$ , $V_{GE}=0\text{V}$ , $T_J=25^{\circ}\text{C}$			1	mA
		$V_{CE}=1200\text{V}$ , $V_{GE}=0\text{V}$ , $T_J=125^{\circ}\text{C}$			10	mA
$I_{GES}$	Gate Leakage Current	$V_{CE}=0\text{V}$ , $V_{GE}=\pm 15\text{V}$ , $T_J=125^{\circ}\text{C}$	-200		200	nA
$Q_g$	Gate Charge	$V_{CE}=600\text{V}$ , $I_C=30\text{A}$ , $V_{GE}=15\text{V}$		0.18		$\mu\text{C}$
$C_{ies}$	Input Capacitance	$V_{CE}=25\text{V}$ , $V_{GE}=0\text{V}$ , $f=1\text{MHz}$		2.27		nF
$C_{res}$	Reverse Transfer Capacitance			0.15		nF
$t_{d(on)}$	Turn - on Delay Time	$V_{CC}=600\text{V}$ , $I_C=30\text{A}$ , $T_J=25^{\circ}\text{C}$		40		ns
		$R_G=15\Omega$ , $T_J=125^{\circ}\text{C}$		50		ns
$t_r$	Rise Time	$V_{GE}=15\text{V}$ , $T_J=25^{\circ}\text{C}$		35		ns
		Inductive Load $T_J=125^{\circ}\text{C}$		40		ns
$t_{d(off)}$	Turn - off Delay Time	$V_{CC}=600\text{V}$ , $I_C=30\text{A}$ , $T_J=25^{\circ}\text{C}$		220		ns
		$R_G=15\Omega$ , $T_J=125^{\circ}\text{C}$		260		ns
$t_f$	Fall Time	$V_{GE}=15\text{V}$ , $T_J=25^{\circ}\text{C}$		100		ns
		Inductive Load $T_J=125^{\circ}\text{C}$		200		ns
$E_{on}$	Turn - on Energy	$V_{CC}=600\text{V}$ , $I_C=30\text{A}$ , $T_J=25^{\circ}\text{C}$		2.0		mJ
		$R_G=15\Omega$ , $T_J=125^{\circ}\text{C}$		2.5		mJ
$E_{off}$	Turn - off Energy	$V_{GE}=15\text{V}$ , $T_J=25^{\circ}\text{C}$		1.9		mJ
		Inductive Load $T_J=125^{\circ}\text{C}$		2.4		mJ
$I_{sc}$	Short Circuit Current	$t_{psc}\leq 10\mu\text{s}$ , $V_{GE}=15\text{V}$ $T_J=125^{\circ}\text{C}$ , $V_{CC}=600\text{V}$		150		A
$R_{thJC}$	Junction-to-Case Thermal Resistance				0.45	K/W
<b>Anti-Parallel Diode</b>						
$V_F$	Forward Voltage	$I_F=10\text{A}$ , $V_{GE}=0\text{V}$ , $T_{vj}=25^{\circ}\text{C}$		1.6	2.0	V
		$I_F=10\text{A}$ , $V_{GE}=0\text{V}$ , $T_{vj}=125^{\circ}\text{C}$		1.6		V
$I_{RRM}$	Max. Reverse Recovery Current	$I_F=10\text{A}$ , $V_R=600\text{V}$		15		A
$Q_{rr}$	Reverse Recovery Charge	$di_F/dt=-700\text{A}/\mu\text{s}$		1.8		$\mu\text{C}$
$E_{rec}$	Reverse Recovery Energy	$T_{vj}=125^{\circ}\text{C}$		0.9		mJ
$R_{thJCD}$	Junction-to-Case Thermal Resistance				2.1	K/W

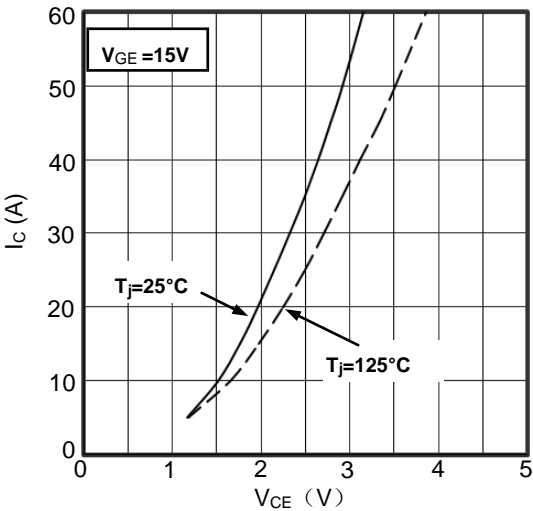


Figure1. Typical Output characteristics

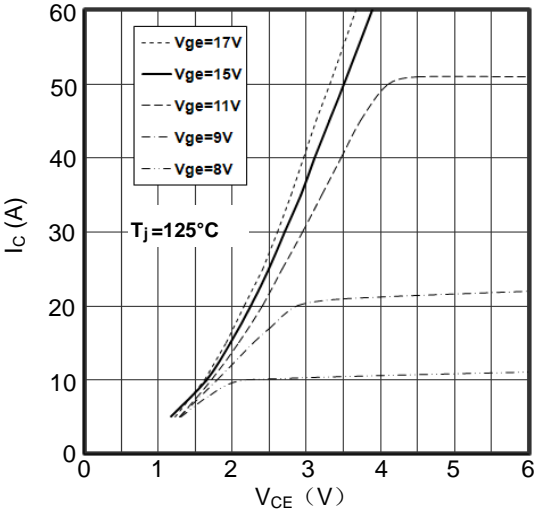


Figure2. Typical Output characteristics

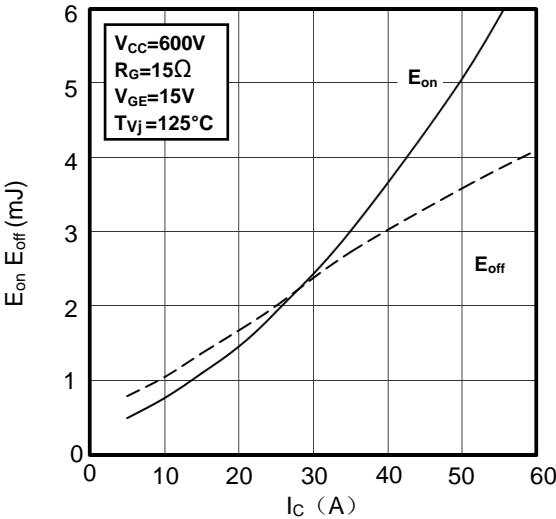


Figure3.Switching Energy vs. Collector Current

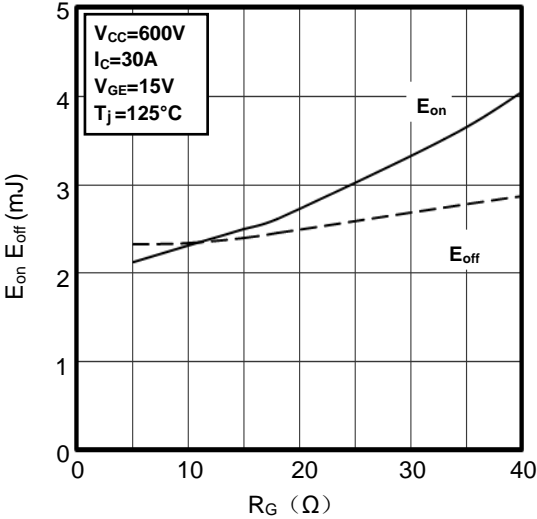


Figure4. Switching Energy vs. Gate Resistor

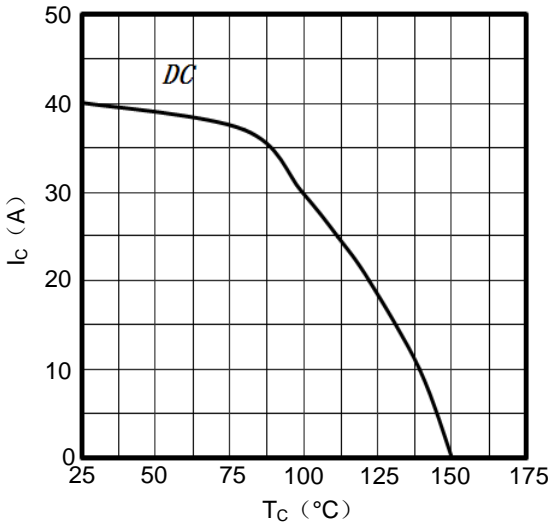


Figure5. IGBT  $T_C$  vs. Collector Current

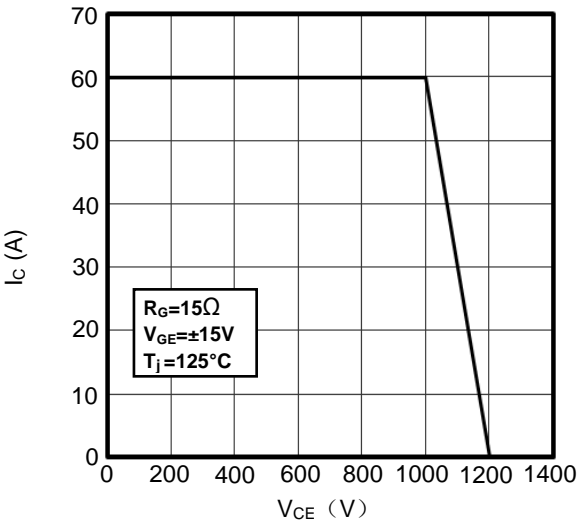


Figure6. Reverse Biased Safe Operating Area

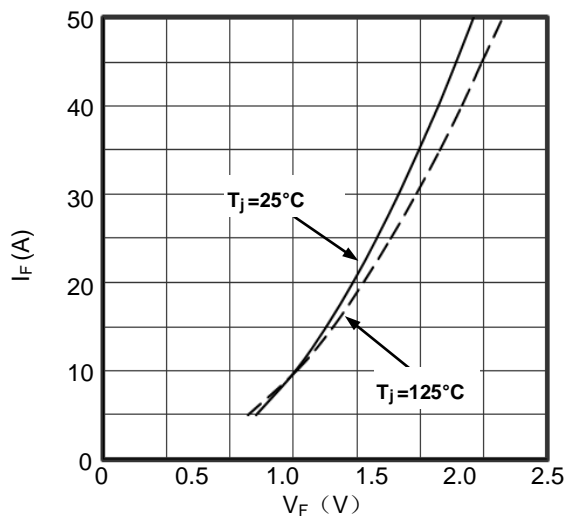


Figure7. Diode Forward Characteristics

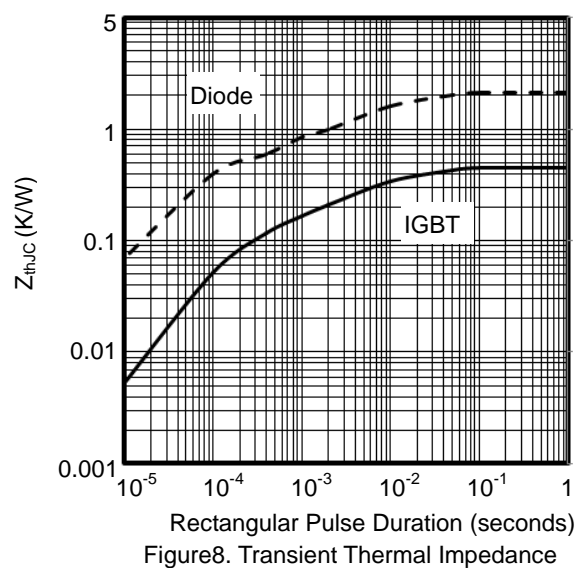
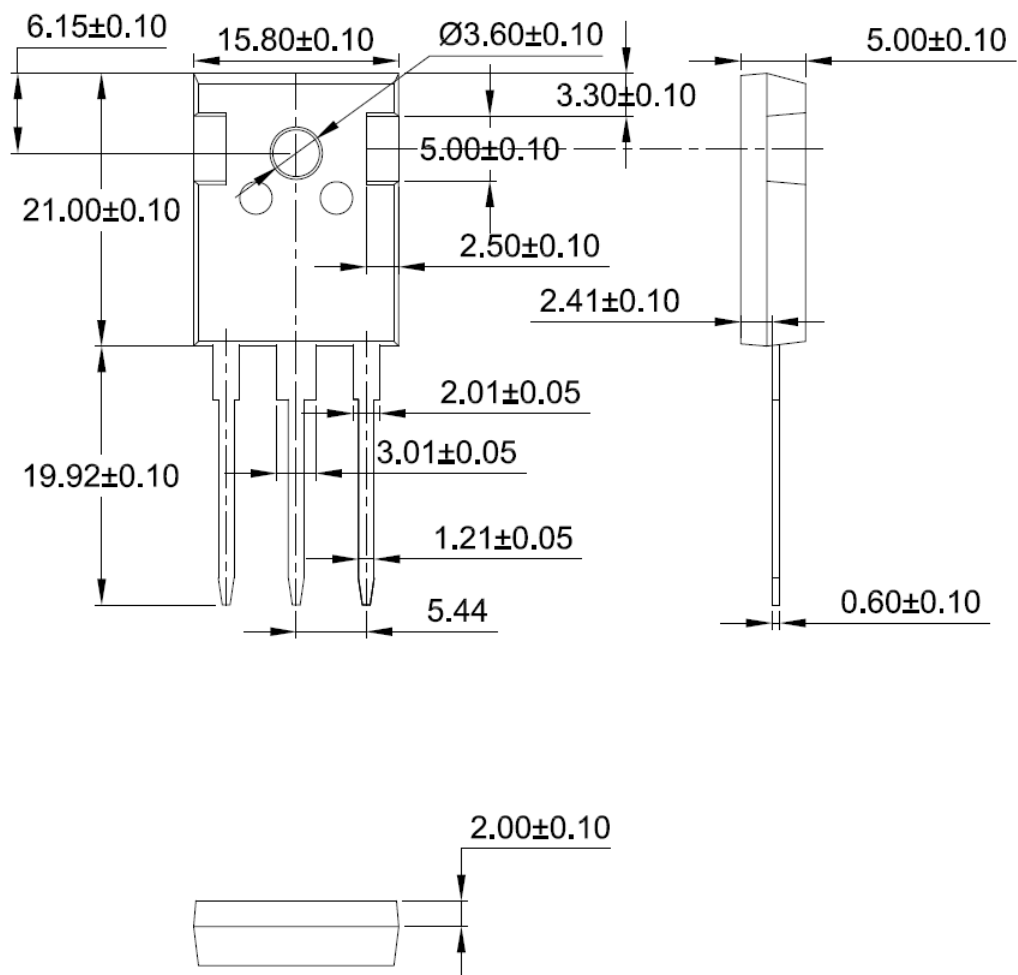


Figure8. Transient Thermal Impedance



Dimensions in Millimeters  
Figure 9. Package Outline