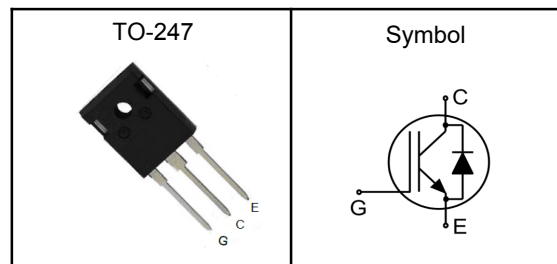


330V/80A Trench FS II Fast IGBT
Features

- Trench FS II Technology
- Very low $V_{CE(sat)}$
- High speed switching
- ROHS Compliant

Applications

- Inverter welding machine
- Motor drives
- UPS

Pin Description


V_{CES}	330	V
$V_{CE(sat)-Typ}$	1.3	V
I_C	80	A

Absolute Maximum Ratings ($T_C=25^{\circ}C$, Unless Otherwise Noted)

Parameter	Symbol	Rating	Units
Collector-Emitter Voltage	V_{CES}	330	V
Gate- Emitter Voltage	V_{GES}	± 30	V
Collector Current ¹	I_C	180	A
Collector Current ¹	I_C	80	A
Pulsed Collector Current ²	I_{CM}	450	A
Diode Continuous Forward Current	I_F	80	A
Diode Pulsed Forward Current	I_{FM}	225	A
Power Dissipation	P_D	420	W
Power Dissipation	P_D	180	W
Storage Temperature Range	T_{STG}	-55 to 150	$^{\circ}C$
Operating Junction Temperature Range	T_J	-55 to 150	$^{\circ}C$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	---	35	$^{\circ}C/W$
Thermal Resistance Junction to case for IGBT	$R_{\theta JC}$	---	0.3	$^{\circ}C/W$
Thermal Resistance Junction to case for Diode	$R_{\theta JCD}$	---	0.8	$^{\circ}C/W$

**330V/80A Trench FS II Fast IGBT****Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)**

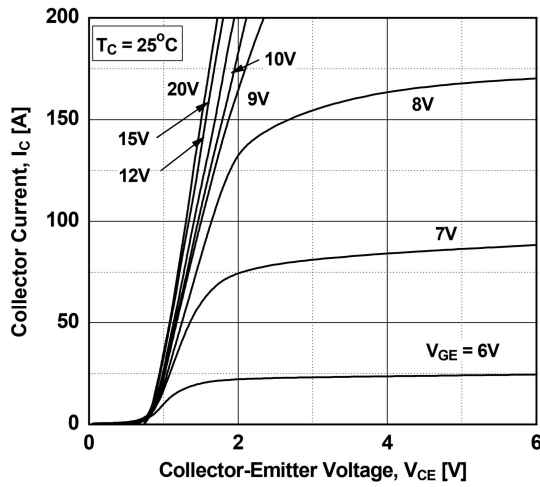
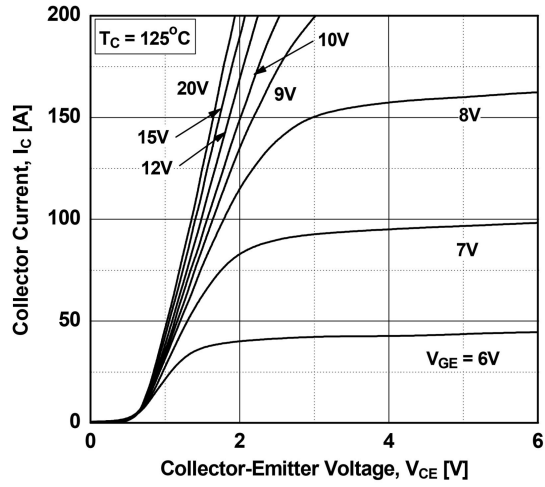
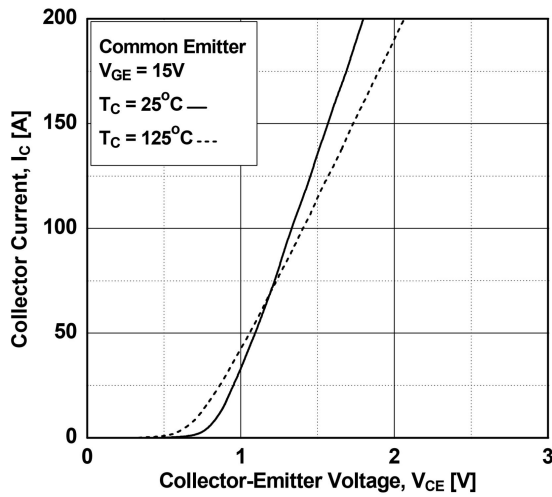
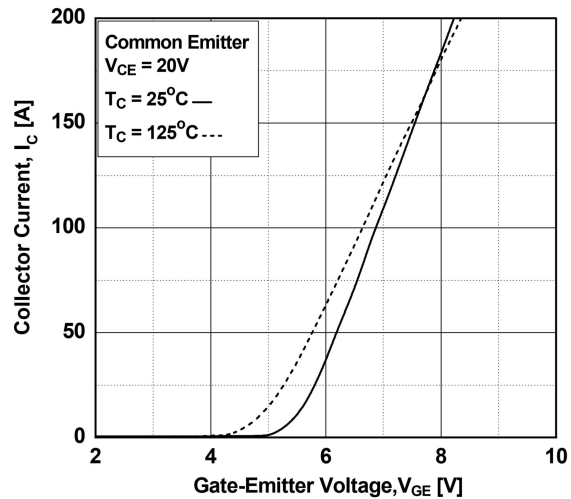
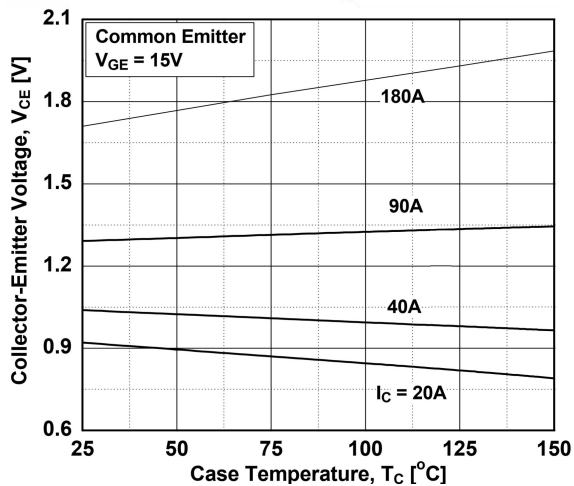
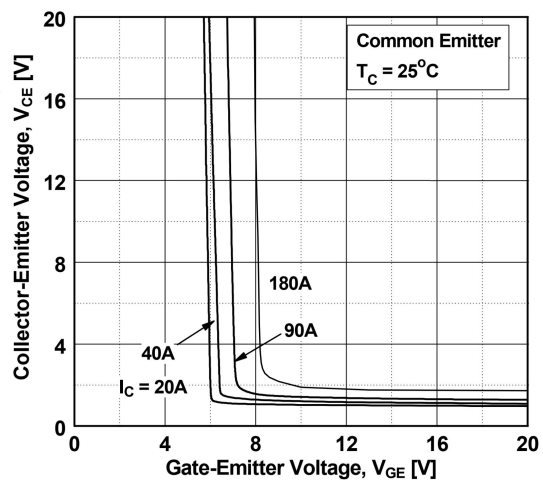
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-Emitter Breakdown Voltage	$V_{(BR)CES}$	$V_{GE}=0V, I_C=400\mu\text{A}$	330	---	---	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=50A$	---	1.3	1.6	V
Gate Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_C=250\mu\text{A}$	2.5	4.0	5.5	V
Collector-Emitter Leakage Current	I_{CES}	$V_{CE}=330V, V_{GE}=0V, T_J=25^\circ\text{C}$	---	---	400	μA
Gate to Emitter Leakage Current	I_{GES}	$V_{GE}=\pm 30V, V_{CE}=0V$	---	---	± 400	nA
Total Gate Charge	Q_g	$V_{CC}=200V, V_{GE}=15V, I_C=40A$	---	169	---	nC
Gate to Emitter Charge	Q_{ge}		---	22	---	nC
Gate to Collector Charge	Q_{gc}		---	69	---	nC
Turn-On Delay Time	$t_{d(ON)}$	$V_{CE}=200V, V_{GE}=15V, R_G=5\Omega, I_C=40A, T_J=25^\circ\text{C}$ Inductive Load	---	27	---	ns
Rise Time	t_r		---	80	---	
Turn-Off Delay Time	$t_{d(off)}$		---	108	---	
Fall Time	t_f		---	180	---	
Input Capacitance	C_{ies}	$V_{CE}=30V, V_{GE}=0V, f=1\text{MHz}$	---	3900	---	pF
Output Capacitance	C_{oes}		---	320	---	
Reverse Transfer Capacitance	C_{res}		---	200	---	

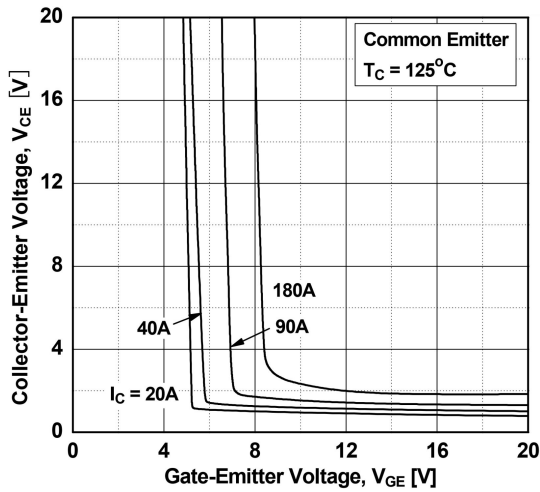
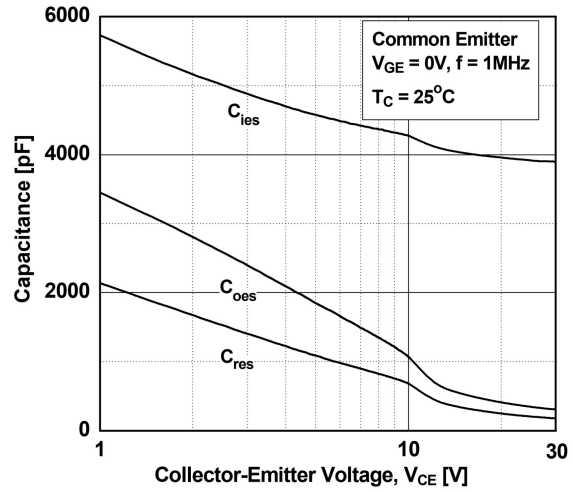
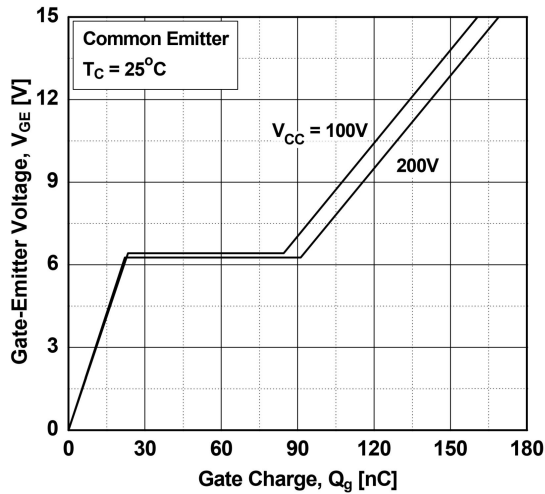
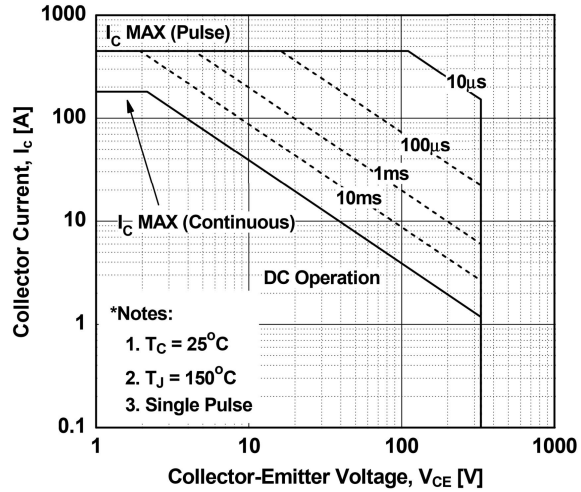
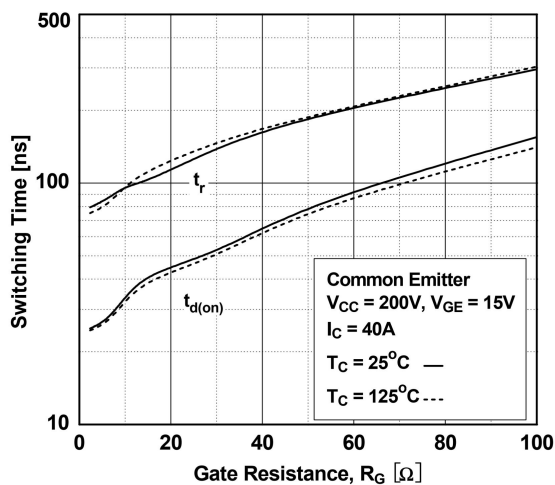
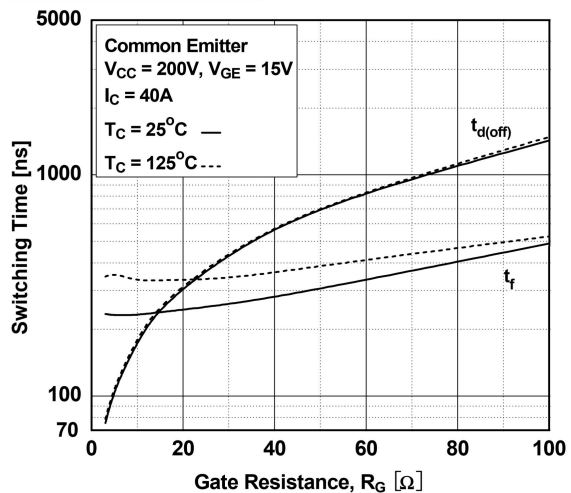
Drain-Source Diode Characteristics

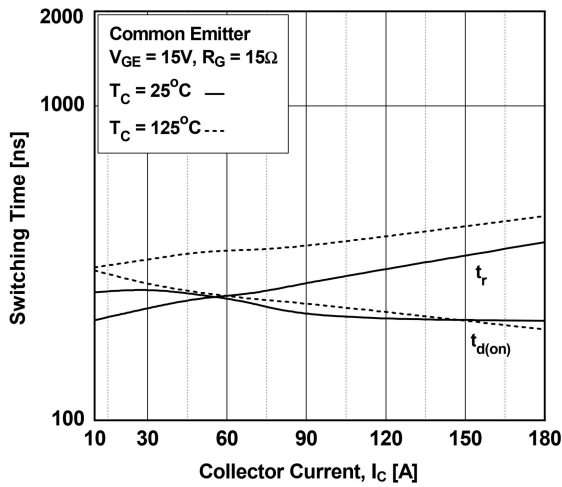
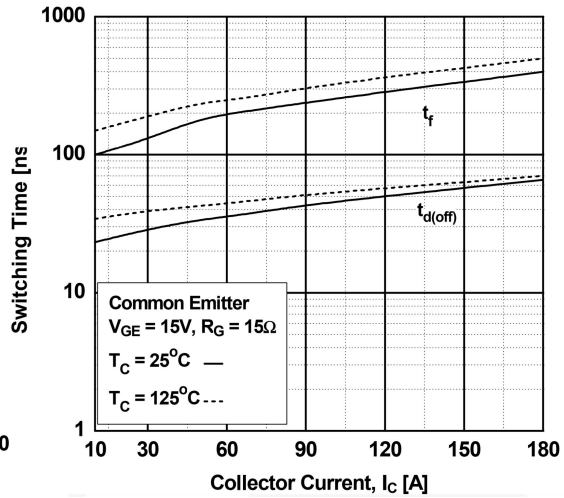
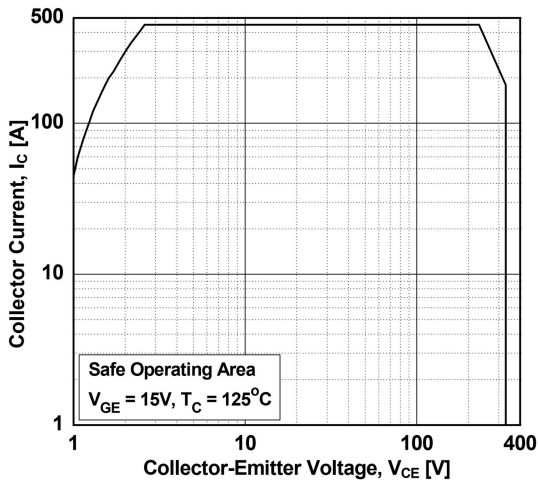
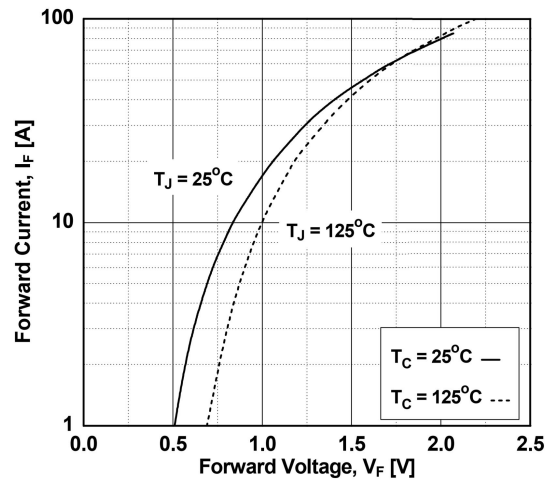
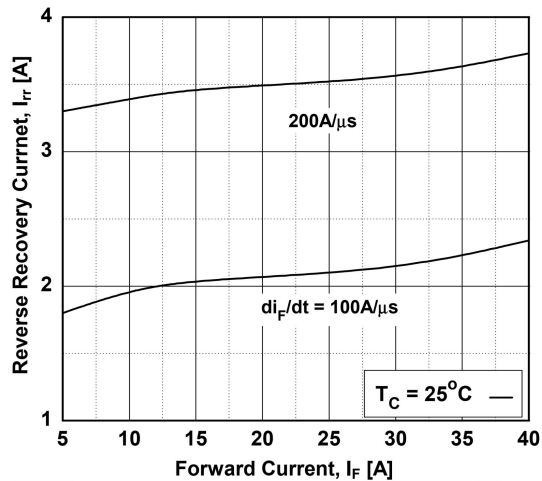
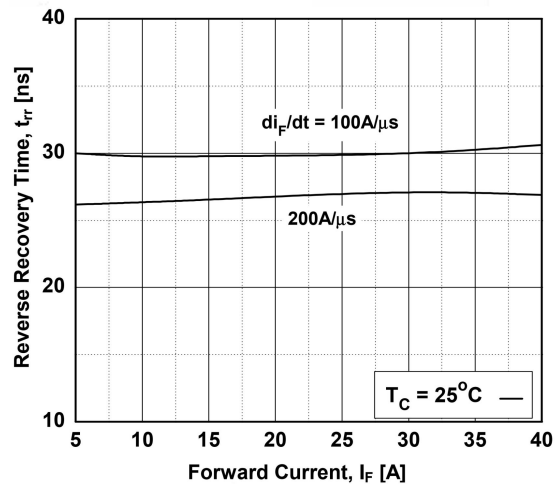
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode Forward Voltage	V_F	$I_F=50A, T_C=25^\circ\text{C}$	---	1.3	1.5	V
Reverse Recovery Time	t_{rr}	$I_F=50A, di/dt=200A/\mu\text{s}, T_J=25^\circ\text{C}$	---	33	---	nS
Reverse Recovery Charge	Q_{rr}		---	50	---	μC
Diode Peak Reverse Recovery Current	I_{rrm}		---	4	---	A

Note:

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$

330V/80A Trench FS II Fast IGBT
Typical Characteristics
Typical Output Characteristics

Typical Output Characteristics

Typical Saturation Voltage Characteristics

Transfer Characteristics

Saturation Voltage vs. Case Temperature at Variant Current Level

Saturation Voltage vs. Vge


330V/80A Trench FS II Fast IGBT
Saturation Voltage vs. V_{GE}

Capacitance Characteristics

Gate charge Characteristics

SOA Characteristics

Turn-on Characteristics vs. Gate Resistance

Turn-off Characteristics vs. Gate Resistance


330V/80A Trench FS II Fast IGBT
Turn-on Characteristics vs. Collector Current

Turn-off Characteristics v Collector Current

Turn off Switching SOA Characteristics

Forward Characteristics

Reverse Recovery Current

Reverse Recovery Time


330V/80A Trench FS II Fast IGBT

