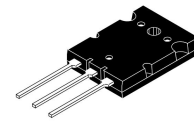


Features

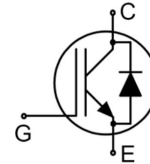
- Extremely Efficient Trench with Field Stop Technology
- $T_{Jmax} = 175^{\circ}C$
- Soft Fast Reverse Recovery Diode
- Optimized for High Speed Switching
- 10 μs Short Circuit Capability



TO-264

Applications

- Solar Inverter
- UPS



Absolute Ratings ($T_c=25^{\circ}C$)

Parameter	Symbol	Value	Unit
Collector-Emmitter Voltage	V_{CES}	1200	V
Collector Current-continuous	I_C $T=25^{\circ}C$ $T=100^{\circ}C$	100	A
		50	A
Collector Current-pulse(note 1)	I_{CM}	200	A
Diode Continuous forward current	I_F $T=100^{\circ}C$	50	A
Diode Maximum Forward Current (Note 1)	I_{FM}	200	A
Gate-Emmitter Voltage	V_{GES}	± 20	V
Short Circuit Withstand Time	t_{sc}	10	μs
Power Dissipation($T_c=25^{\circ}C$)	P_D $T_c=25^{\circ}C$ $T_c=100^{\circ}C$	535	W
Power Dissipation($T_c=100^{\circ}C$)		267	W
Operating Temperature Range	T_J	$-55 \sim +175$	$^{\circ}C$
Storage Temperature Range	T_{STG}	$-55 \sim +175$	$^{\circ}C$
Maximum Lead Temperature for Soldering Purposes	T_L	260	$^{\circ}C$

Electrical Characteristic($T_c=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off-Characteristics						
Collector-Emmitter Voltage	BV_{CES}	$I_C=500\mu A, V_{GE}=0V$	1200	-	-	V

Zero Gate Voltage Collector Current	I _{CES}	V _{CE} =1200V,V _{GE} =0V	-	-	0.1	mA
		T _C =175°C			2.0	mA
Gate-body leakage current	I _{GES}	V _{CE} =0V,V _{GE} =±20V	-	-	±200	nA
On-Characteristics						
Gate-Emmitter Threshold Voltage	V _{GE(th)}	V _{CE} =V _{GE} , I _c =250uA	4.5	5.5	6.5	V
Collector-Emmitter saturation Voltage	V _{CESAT}	V _{GE} =15V,I _c =50A, V _{GE} =15 V, I _c =50 A, T _J =175°C	-	2.20	2.40	V
				2.60		
Dynamic Characteristics						
Input capacitance	C _{ies}	V _{CE} =20V, V _{GE} =0V, f=1.0MHZ, T _C =25°C	-	7383	-	pF
Output capacitance	C _{oes}		-	233	-	pF
Reverse transfer capacitance	C _{res}		-	139	-	pF
Total Gate Charge	Q _g	V _{CE} =600V,I _c =50A, V _{GE} =15V,T _C =25°C	-	311	-	nC
Gate to emitter charge	Q _{ge}		-	64	-	
Gate to collector charge	Q _{gc}		-	155	-	
Switching Characteristics						
Turn-On delay time	t _{d(on)}	V _{CC} =600V,I _c =50A, R _G =10Ω,V _{GE} =15V Inductive load T _C =25°C	-	118	-	ns
Turn-On rise time	t _r		-	48	-	ns
Turn-off delay time	t _{d(off)}		-	282	-	ns
Turn-off Fall time	t _f		-	113	-	ns
Turn-on switching loss	E _{on}		-	4.40	-	mJ
Turn-off switching loss	E _{off}		-	1.40	-	mJ
Total switching loss	E _{ts}		-	5.80	-	mJ
Turn-On delay time	t _{d(on)}	V _{CC} =600V,I _c =50A, R _G =10Ω,V _{GE} =15V Inductive load T _C =175°C	-	114	-	ns
Turn-On rise time	t _r		-	49	-	ns
Turn-off delay time	t _{d(off)}		-	298	-	ns
Turn-off Fall time	t _f		-	243	-	ns
Turn-on switching loss	E _{on}		-	5.65	-	mJ
Turn-off switching loss	E _{off}		-	3.26	-	mJ
Total switching loss	E _{ts}		-	8.91	-	mJ
Anti-Paraller Diode Characteristics and Maximum Ratings						
Diode Forward Voltage	V _F	V _{GE} =0V,I _F =50A.	-	2.00	2.60	V
		T _J =175°C		2.55		

Diode Reverse recovery time	t_{rr}	$V_R=400V, I_F=50A$ $di_F/dt=200A/\mu s$ $T_J=25^\circ C$	-	256	-	ns
Reverse recovery charge	Q_{rr}		-	2.7	-	μC
Diode Reverse recovery Current	I_{rrm}		-	19	-	A
Diode Reverse recovery time	t_{rr}	$V_R=400V, I_F=50A$ $di_F/dt=200A/\mu s$ $T_J=175^\circ C$	-	400	-	ns
Reverse recovery charge	Q_{rr}		-	5.75	-	μC
Diode Reverse recovery Current	I_{rrm}		-	27	-	A

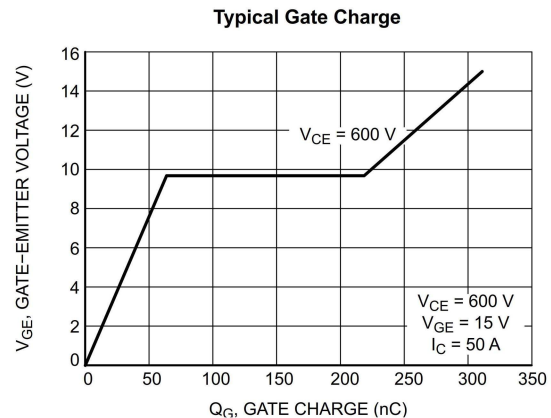
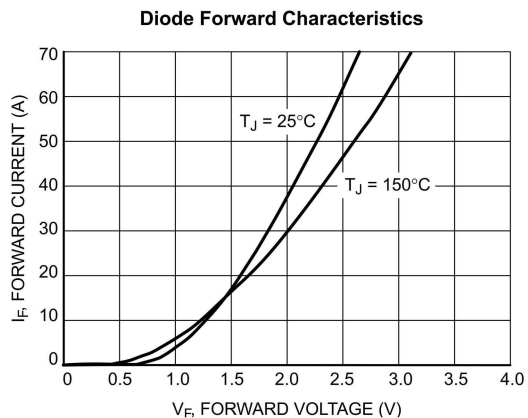
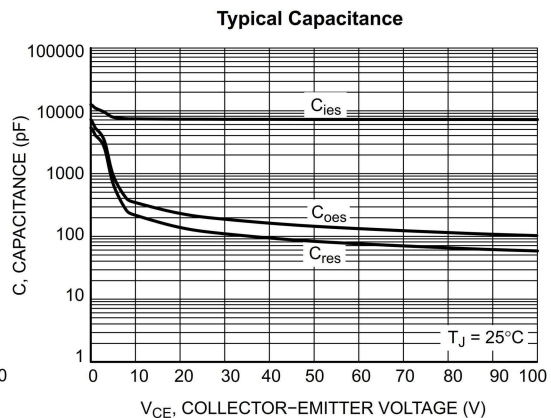
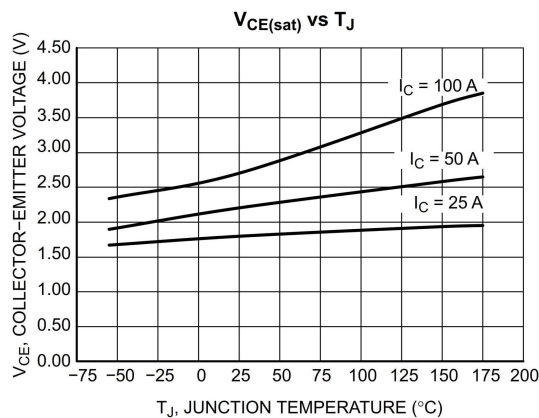
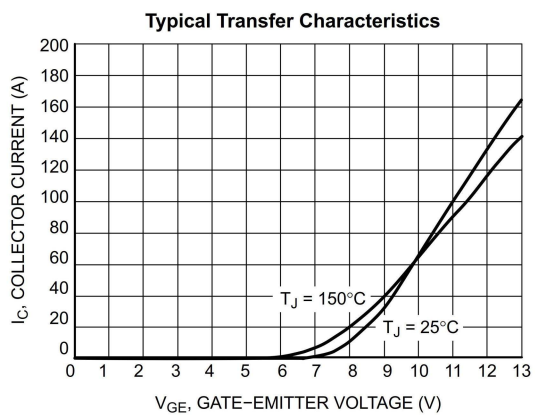
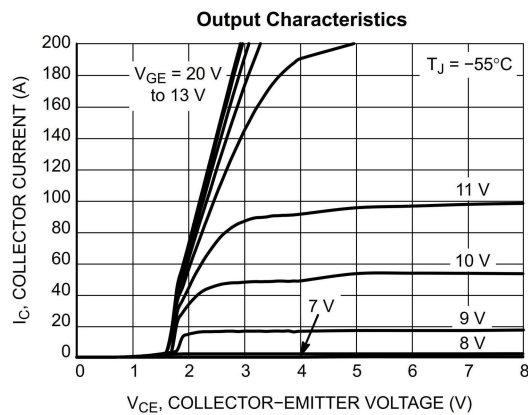
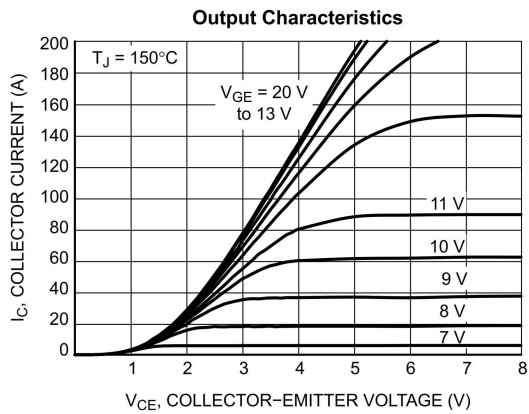
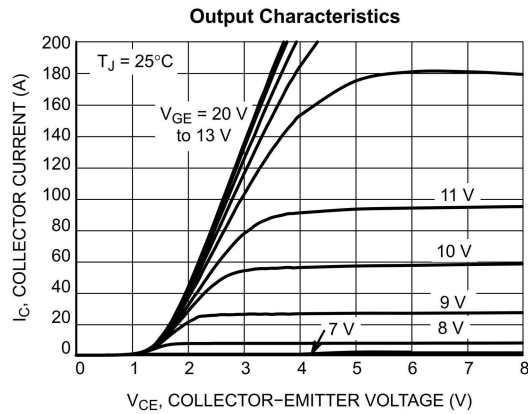
Thermal Characteristics

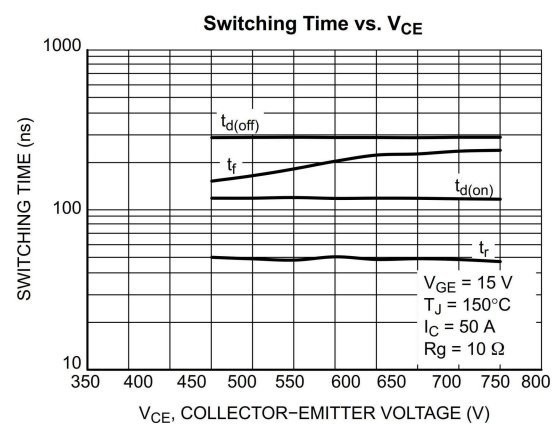
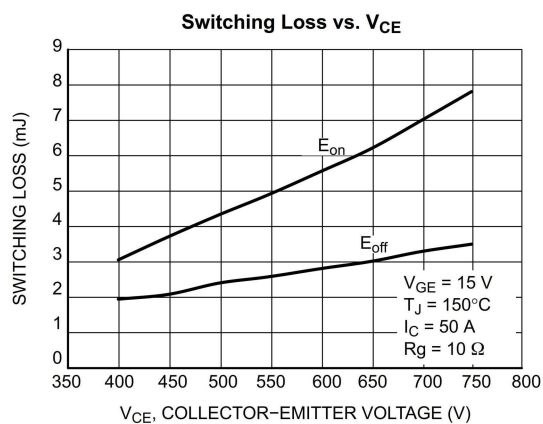
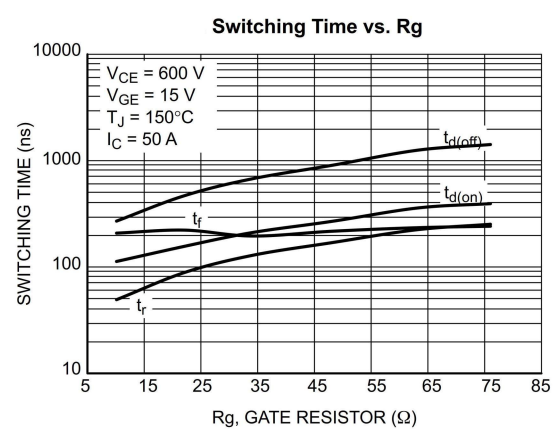
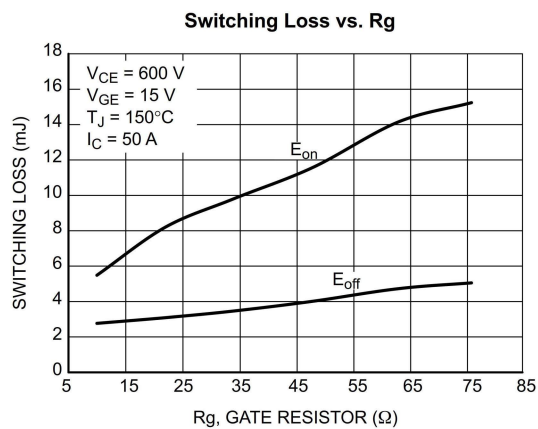
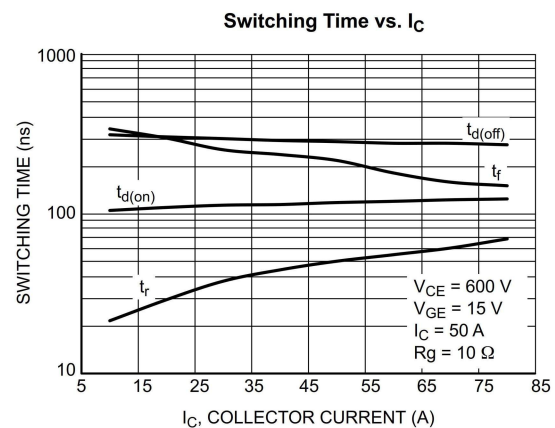
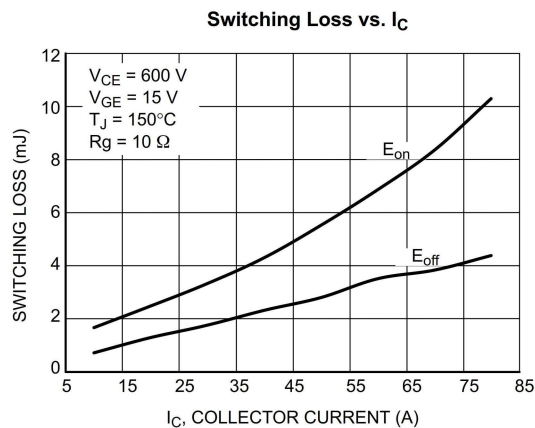
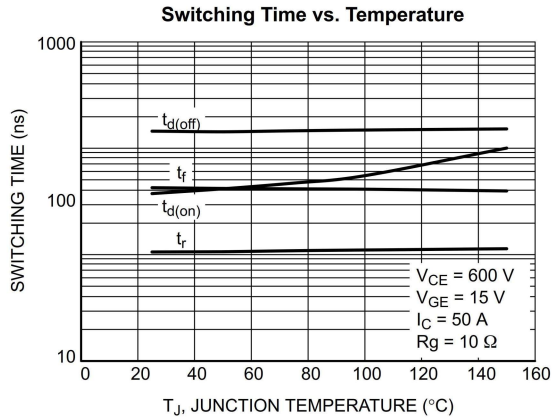
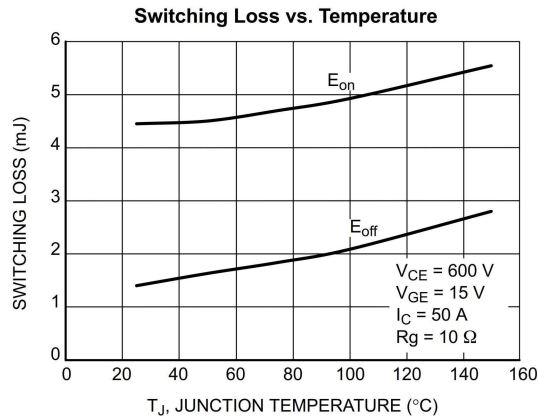
Symbol	Parameter	Max	Units
$R_{th\ j-c}$	Thermal Resistance, Junction to case for IGBT	0.28	$^\circ C/W$
$R_{th\ j-c}$	Thermal Resistance, Junction to case for Diode	0.5	$^\circ C/W$
$R_{th\ j-a}$	Thermal Resistance, Junction to Ambient	40	$^\circ C/W$

Notes:

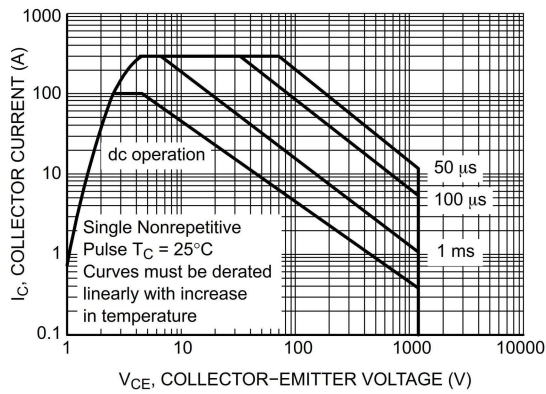
1: . Repetitive Rating: Pulse width limited by maximum junction temperature

Electrical Characteristics (curves)

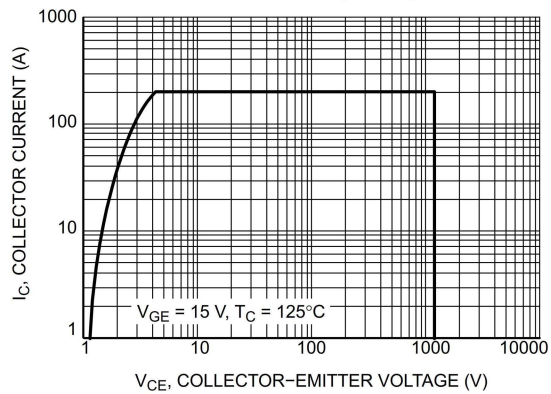




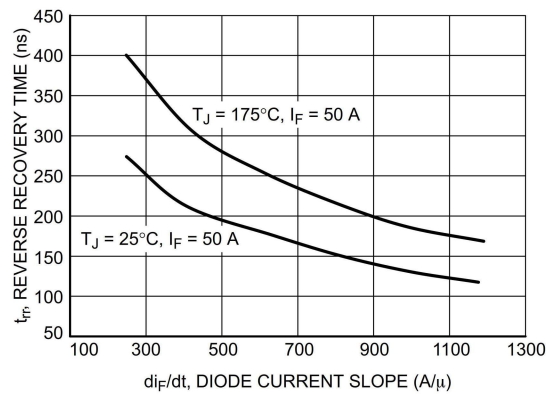
Safe Operating Area



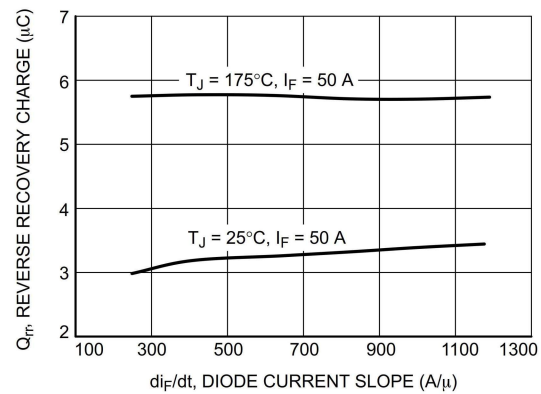
Reverse Bias Safe Operating Area



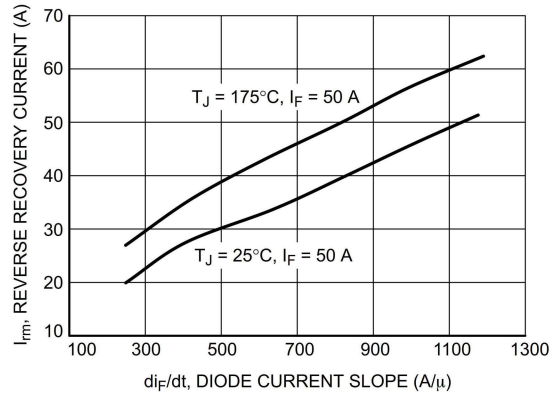
t_{rr} vs. di_F/dt ($V_R = 400\text{ V}$)



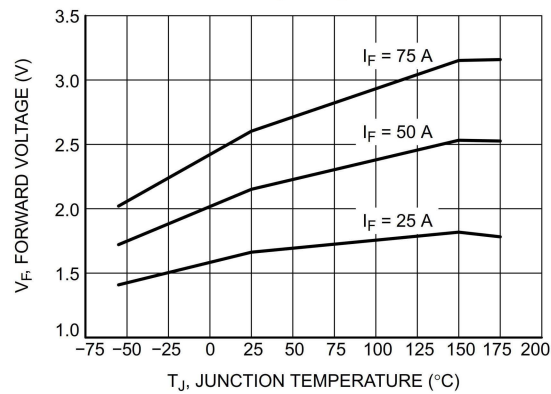
Q_{rr} vs. di_F/dt ($V_R = 400\text{ V}$)



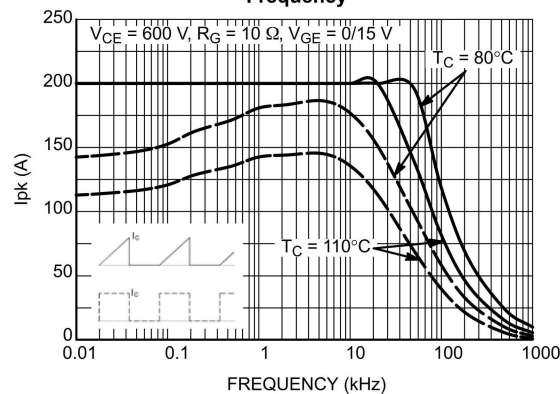
I_{rm} vs. di_F/dt ($V_R = 400\text{ V}$)

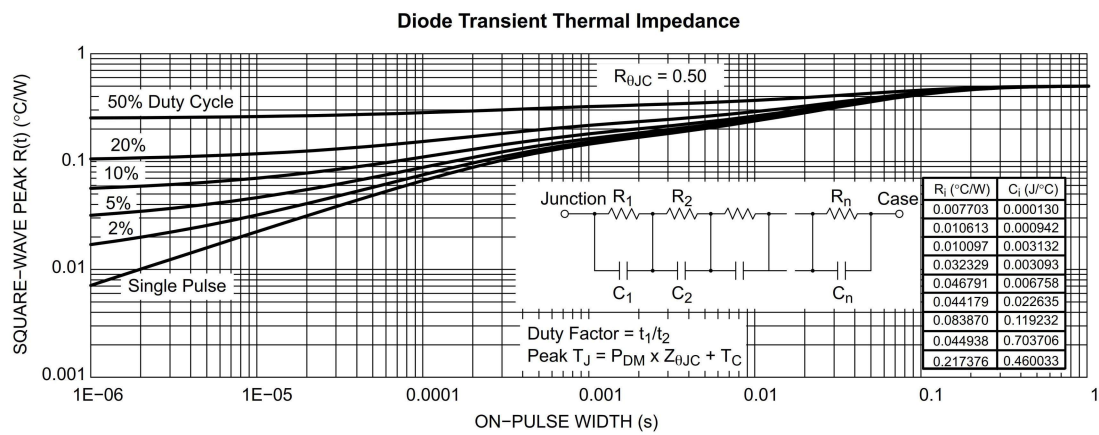
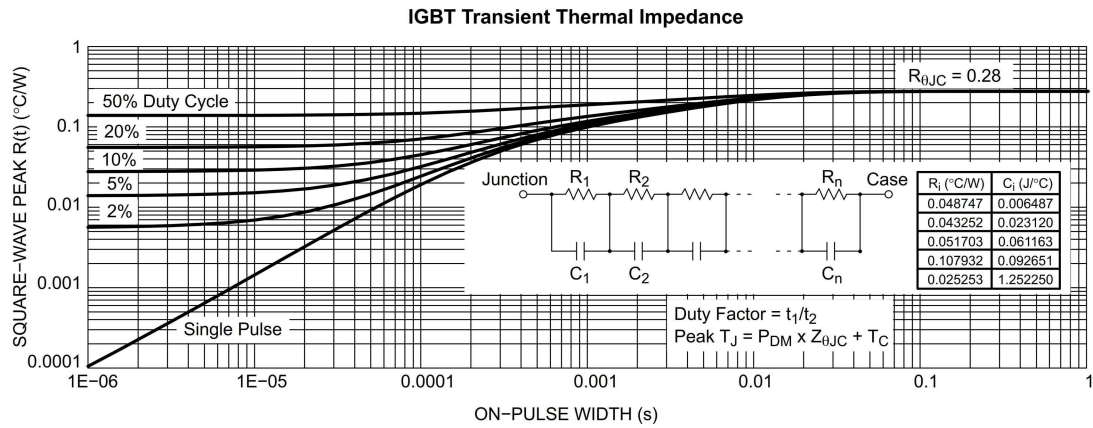


V_F vs. T_J



Collector Current vs. Switching Frequency





Package Mechanical DATA

