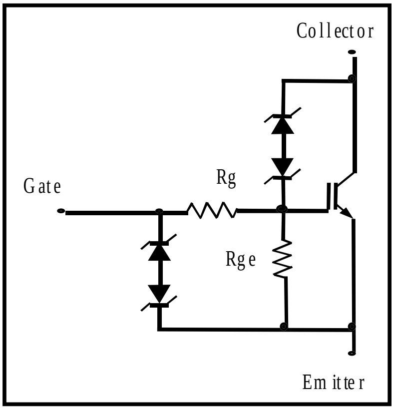
International
IOR Rectifier

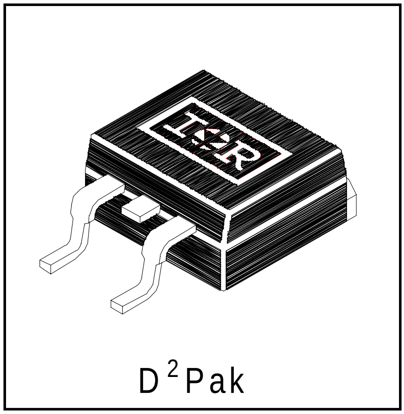
PROVISIONAL

IRGS14B40L

INSULATED GATE BIPOLAR TRANSISTOR

14A, Voltage Clamped
400V IGBT





		MIN	TYP	MAX	UNITS	CONDITIONS
V_{CL}	COLLECTOR - EMITTER CLAMPING VOLTAGE	370	400	430	V	RG =1 kOhm , Ic =7A
V_{ECAV}	EMITTER - COLLECTOR AVALANCHE VOLTAGE	24	30		V	Ic = -10mA, 25 C
$V_{GE(TH)}$	GATE - EMITTER THRESHOLD VOLTAGE	0.75	1.8	2.2	V	Ic = 1 mA
I_{C25}	CONTINUOUS COLLECTOR CURRENT			18	A	VGE = 5V, 25 C
I_{C100}	CONTINUOUS COLLECTOR CURRENT			14	A	VGE = 5V, 100 C
V_{GE}	GATE - EMITTER VOLTAGE	-10		10	V	
T_J	OPERATING JUNCTION TEMPERATURE RANGE	-40		175	C	
V_{ESD}	ELECTROSTATIC VOTAGE FROM EACH PIN TO EACH OF THE OTHER PINS	-6		6	kV	C= 100pF, R = 1.5 kOhms
$I_{SCIS25C}$	SELF CLAMPED INDUCTIVE SWITCHING CURRENT	24 14 10			A A A	0.7mH INDUCTANCE, 25 C 2.2mH INDUCTANCE, 25 C 4.7mH INDUCTANCE, 25 C
$I_{SCIS100C}$	SELF CLAMPED INDUCTIVE SWITCHING CURRENT	13 7.5 5.5			A A A	1.5mH INDUCTANCE, 150 C 4.7mH INDUCTANCE, 150 C 8.7mH INDUCTANCE, 150 C
t_{sc}	SHORT CIRCUIT WITHSTAND TIME	750			us	Tc = 150 C
R1	GATE SERIES RESISTANCE		75		Ohms	
R2	GATE EMITTER RESISTANCE		20		k Ohms	
$V_{CE(ON)}$	COLLECTOR - EMITTER SATURATION VOLTAGE		1.55 1.8		V V	Ic= 7A, VGE =5V, 25C Ic = 10A, VGE =5V, 25C
R_{qJC}	THERMAL RESISTANCE, JUNCTION TO CASE			1.5	^{o}K / WATT	
R_{qJA}	THERMAL RESISTANCE,JUNCTION TO AMBIENT (PCB MOUNTED, STEADY STATE)			40	^{o}K / WATT	

Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions	
$V_{(BR)CES}$	Collector-to-Emitter Breakdown Voltage③		—	—	V	V_{GE} = V, I_C = µA	
$DV_{(BR)CES}/DT_J$	Temperature Coeff. of Breakdown Voltage	—	—	—	V/°C	V_{GE} = V, I_C = mA	
$V_{CE(on)}$	Collector-to-Emitter Saturation Voltage	—	1.55	—	V	I_C = 7A V_{GE} = 5V	See Fig. 2, 5
		—	1.8	—		I_C = 10A	
		—		—		I_C = A, T_J = °C	
$V_{GE(th)}$	Gate Threshold Voltage		—			V_{CE} = V_{GE}, I_C = µA	
$DV_{GE(th)}/DT_J$	Temperature Coeff. of Threshold Voltage	—	——	—	mV/°C	V_{CE} = V_{GE}, I_C = µA	
g_{fe}	Forward Transconductance ④	——	——	—	S	V_{CE} = V, I_C = A	
I_{CES}	Zero Gate Voltage Collector Current	—	—		µA	V_{GE} = V, V_{CE} = V	
		—	—			V_{GE} = V, V_{CE} = V, T_J = °C	
V_{FM}	Diode Forward Voltage Drop	—			V	I_C = A	See Fig. 13
		—				I_C = A, T_J = °C	
I_{GES}	Gate-to-Emitter Leakage Current	—	—		nA	V_{GE} = V	

Switching Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions	
Q_g	Total Gate Charge (turn-on)	—		—	nC	I_C = A	
Q_{ge}	Gate - Emitter Charge (turn-on)	—		—		V_{CC} = V	See Fig.8
Q_{gc}	Gate - Collector Charge (turn-on)	—		—		V_{GE} = V	
$t_{d(on)}$	Turn-On Delay Time	—	—	—	ns		
t_r	Rise Time	—	—	—		T_J = °C	
$t_{d(off)}$	Turn-Off Delay Time	—	—	—		I_C = A, V_{CC} = V	
t_f	Fall Time	—	—	—		V_{GE} = V, R_G = W	
E_{on}	Turn-On Switching Loss	—		—	mJ	Energy losses include "tail"	
E_{off}	Turn-Off Switching Loss	—		—		See Fig. 9,10,14	
E_{ts}	Total Switching Loss	—		—			
t_{sc}	Short Circuit Withstand Time	—	—	750	µs	V_{CC} = V, T_J = °C V_{GE} = V, R_G = W , V_{CPK} < V	
$t_{d(on)}$	Turn-On Delay Time	—	—	—	ns	T_J = °C,	
t_r	Rise Time	—	—	—		I_C = A, V_{CC} = V	
$t_{d(off)}$	Turn-Off Delay Time	—	—	—		V_{GE} = V, R_G = W	
t_f	Fall Time	—	—	—		Energy losses include "tail"	
E_{ts}	Total Switching Loss	—		—	mJ	See Fig. 11,14	
L_E	Internal Emitter Inductance	—		—	nH	Measured 5mm from package	
C_{ies}	Input Capacitance	—		—	pF	V_{GE} = V	
C_{oes}	Output Capacitance	—		—		V_{CC} = V	See Fig. 7
C_{res}	Reverse Transfer Capacitance	—		—		*f* = MHz	
t_{rr}	Diode Reverse Recovery Time	—			ns	T_J = °C See Fig.	
		—				T_J = °C 14	I_F = A
I_{rr}	Diode Peak Reverse Recovery Current	—			A	T_J = °C See Fig.	
		—				T_J = °C 15	V_R = V
Q_{rr}	Diode Reverse Recovery Charge	—			nC	T_J = °C See Fig.	
		—				T_J = °C 16	di/dt = Aµs
$di_{(rec)M}/dt$	Diode Peak Rate of Fall of Recovery	—		—	A/µs	T_J = °C See Fig.	
	During t_b	—		—		T_J = °C 17	