



		MIN	TYP	MAX	UNITS	CONDITIONS
V _{CL}	COLLECTOR - EMITTER CLAMPING VOLTAGE	370	400	430	V	RG = 1 kOhm , I _c = 7A
V _{ECAV}	EMITTER - COLLECTOR AVALANCHE VOLTAGE	24	30		V	I _c = -10mA, 25 C
V _{GE(TH)}	GATE - EMITTER THRESHOLD VOLTAGE	0.75	1.8	2.2	V	I _c = 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 VOLTAGE 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			A	0.7mH INDUCTANCE, 25 C
		14			A	2.2mH INDUCTANCE, 25 C
		10			A	4.7mH INDUCTANCE, 25 C
I _{SCIS100C}	SELF CLAMPED INDUCTIVE SWITCHING CURRENT	13			A	1.5mH INDUCTANCE, 150 C
		7.5			A	4.7mH INDUCTANCE, 150 C
		5.5			A	8.7mH INDUCTANCE, 150 C
t _{sc}	SHORT CIRCUIT WITHSTAND TIME	750			us	T _c = 150 C
R1	GATE SERIES RESISTANCE		75		Ohms	
R2	GATE EMITTER RESISTANCE		20		k Ohms	
V _{CE(ON)}	COLLECTOR - EMITTER SATURATION VOLTAGE		1.55		V	I _c = 7A, VGE = 5V, 25C
			1.8		V	I _c = 10A, VGE = 5V, 25C
R _{qJC}	THERMAL RESISTANCE, JUNCTION TO CASE			1.5	°K / WATT	
R _{qJA}	THERMAL RESISTANCE, JUNCTION TO AMBIENT (PCB MOUNTED, STEADY STATE)			40	°K / WATT	

Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)CES}$	Collector-to-Emitter Breakdown Voltage ^③	—	—	—	V	$V_{GE} = V, I_C = \mu\text{A}$
$DV_{(BR)CES}/DT_J$	Temperature Coeff. of Breakdown Voltage	—	—	—	V/ $^\circ\text{C}$	$V_{GE} = V, I_C = \text{mA}$
$V_{CE(on)}$	Collector-to-Emitter Saturation Voltage	—	1.55	—	V	$I_C = 7\text{A}, V_{GE} = 5\text{V}$
		—	1.8	—		$I_C = 10\text{A}$
		—	—	—		$I_C = \text{A}, T_J = ^\circ\text{C}$
$V_{GE(th)}$	Gate Threshold Voltage	—	—	—		$V_{CE} = V_{GE}, I_C = \mu\text{A}$
$DV_{GE(th)}/DT_J$	Temperature Coeff. of Threshold Voltage	—	—	—	mV/ $^\circ\text{C}$	$V_{CE} = V_{GE}, I_C = \mu\text{A}$
g_{fe}	Forward Transconductance ^④	—	—	—	S	$V_{CE} = V, I_C = \text{A}$
I_{CES}	Zero Gate Voltage Collector Current	—	—	—	μA	$V_{GE} = V, V_{CE} = V$
		—	—	—		$V_{GE} = V, V_{CE} = V, T_J = ^\circ\text{C}$
V_{FM}	Diode Forward Voltage Drop	—	—	—	V	$I_C = \text{A}$ See Fig. 13
		—	—	—		$I_C = \text{A}, T_J = ^\circ\text{C}$
I_{GES}	Gate-to-Emitter Leakage Current	—	—	—	nA	$V_{GE} = V$

Switching Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
Q_g	Total Gate Charge (turn-on)	—	—	—	nC	$I_C = \text{A}$
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	$T_J = ^\circ\text{C}$
t_r	Rise Time	—	—	—		$I_C = \text{A}, V_{CC} = V$
$t_{d(off)}$	Turn-Off Delay Time	—	—	—		$V_{GE} = V, R_G = \omega$
t_f	Fall Time	—	—	—		Energy losses include "tail"
E_{on}	Turn-On Switching Loss	—	—	—	mJ	See Fig. 9,10,14
E_{off}	Turn-Off Switching Loss	—	—	—		
E_{ts}	Total Switching Loss	—	—	—		
t_{sc}	Short Circuit Withstand Time	—	—	750	μs	$V_{CC} = V, T_J = ^\circ\text{C}$ $V_{GE} = V, R_G = \omega, V_{CPK} < V$
$t_{d(on)}$	Turn-On Delay Time	—	—	—	ns	$T_J = ^\circ\text{C},$
t_r	Rise Time	—	—	—		$I_C = \text{A}, V_{CC} = V$
$t_{d(off)}$	Turn-Off Delay Time	—	—	—		$V_{GE} = V, R_G = \omega$
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	—	—	—		$f = \text{MHz}$
t_{rr}	Diode Reverse Recovery Time	—	—	—	ns	$T_J = ^\circ\text{C}$ See Fig.
		—	—	—		$T_J = ^\circ\text{C}$ 14 $I_F = \text{A}$
I_{rr}	Diode Peak Reverse Recovery Current	—	—	—	A	$T_J = ^\circ\text{C}$ See Fig.
		—	—	—		$T_J = ^\circ\text{C}$ 15 $V_R = V$
Q_{rr}	Diode Reverse Recovery Charge	—	—	—	nC	$T_J = ^\circ\text{C}$ See Fig.
		—	—	—		$T_J = ^\circ\text{C}$ 16 $di/dt = \mu\text{s}$
$di_{(rec)M}/dt$	Diode Peak Rate of Fall of Recovery During t_b	—	—	—	A/ μs	$T_J = ^\circ\text{C}$ See Fig.
		—	—	—		$T_J = ^\circ\text{C}$ 17