

Features

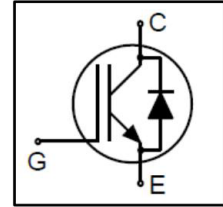
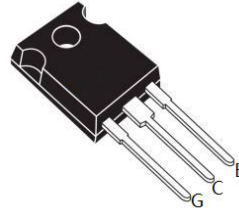
- ◆ Low $V_{CE(sat)}$
- ◆ Fast Switching
- ◆ High Ruggedness
- ◆ Short-Circuit Rated

Application

- ◆ Solar Inverters
- ◆ Energy Storage
- ◆ Industrial Inductive Heating
- ◆ Uninterrupted Power Supply

Product Summary

V_{CES}	650	V
I_C	75	A
$V_{CE(sat),typ}$	1.56	V



Key Performance and Package Parameters

Type	V_{CE}	I_C	$V_{CE(sat)}, T_{vj} = 25^\circ\text{C}$	$T_{vj\ max}$	Package
MIQ75T065DFS	650V	75A	1.56V	175°C	TO-247

Maximum Ratings For

Symbol	Parameter	Value	Unit
V_{CE}	Collector-emitter voltage, $T_{vj} \geq 25^\circ\text{C}$	650	V
I_C	DC collector current, limited by $T_{vj\ max}$, $T_C = 25^\circ\text{C}$	100	A
	DC collector current, limited by $T_{vj\ max}$, $T_C = 100^\circ\text{C}$	75	
I_{Cpuls}	Pulsed collector current, t_p limited by $T_{vj\ max}$	300	A
I_F	Diode forward current, limited by $T_{vj\ max}$, $T_C = 25^\circ\text{C}$	100	A
	Diode forward current, limited by $T_{vj\ max}$, $T_C = 100^\circ\text{C}$	75	
I_{Fpuls}	Diode pulsed current, t_p limited by $T_{vj\ max}$	300	A
V_{GE}	Gate-emitter voltage	± 20	V
V_{GE}	Transient Gate-emitter voltage	± 30	V
t_{SC}	Short circuit withstand time $V_{GE} = 15.0\text{V}$, $V_{CC} \leq 400\text{V}$ Allowed number of short circuits < 1000 Time between short circuits: $\geq 1.0\text{s}$ $T_{vj} = 150^\circ\text{C}$	-	μs
P_{tot}	Power dissipation $T_C = 25^\circ\text{C}$	520	W
	Power dissipation $T_C = 100^\circ\text{C}$	260	
$T_{vj(OP)}$	Operating junction temperature	-40...+150	°C
T_{stg}	Storage temperature	-40...+150	°C
-	Soldering temperature, wave soldering 1.6mm(0.063in.) from case for 10s	260	°C
M	Mounting torque, M3 screw Maximum of mounting processes: 3	-	Nm

■ Thermal Resistance

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	IGBT thermal resistance, junction - case	-	-	-	0.29	°C/W
$R_{\theta JC}$	Diode thermal resistance, junction - case	-	-	-	0.35	°C/W
$R_{\theta JA}$	Thermal resistance, junction - ambient	-	-	-	40	°C/W

■ Static Characteristic, at $T_{vj} = 25^{\circ}\text{C}$, unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_{(BR)CES}$	Collector-emitter breakdown voltage	$V_{GE} = 0V, I_C = 250\mu A$	650	-	-	V
		$V_{GE} = 0V, I_C = 1mA$	650	-	-	
V_{CEsat}	Collector-emitter saturation voltage	$V_{GE} = 15V, I_C = 70A, T_{vj} = 25^{\circ}\text{C}$	-	1.56	2.0	V
		$V_{GE} = 15V, I_C = 70A, T_{vj} = 150^{\circ}\text{C}$	-	1.90	-	
V_F	Diode forward voltage	$V_{GE} = 0V, I_C = 70A, T_{vj} = 25^{\circ}\text{C}$	-	1.55	2.0	V
		$V_{GE} = 0V, I_C = 70A, T_{vj} = 150^{\circ}\text{C}$	-	1.90	-	
$V_{GE(th)}$	Gate-emitter threshold voltage	$V_{CE} = V_{GE}, I_C = 250\mu A$	4.0	4.4	5.0	V
I_{CES}	Zero gate voltage collector current	$V_{CE} = 650V, V_{GE} = 0V, T_{vj} = 25^{\circ}\text{C}$	-	-	1	mA
		$V_{CE} = 650V, V_{GE} = 0V, T_{vj} = 150^{\circ}\text{C}$	-	-	TBC	
I_{GES}	Gate-emitter leakage current	$V_{CE} = 0V, V_{GE} = \pm 20V$	-	-	200	nA
g_{fs}	Transconductance	$V_{CE} = 20V, I_C = 60A$	-	58	-	S

■ Dynamic Characteristics, at $T_{vj} = 25^{\circ}\text{C}$, unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
C_{ies}	Input capacitance	$V_{CE} = 30V, V_{GE} = 0V, F = 1MHz$	-	4472	-	pF
C_{oes}	Output capacitance		-	171	-	
C_{res}	Reverse transfer capacitance		-	20	-	
Q_G	Gate charge	$V_{CC} = 520V, I_C = 70A, V_{GE} = 15V$	-	273	-	nC
L_E	Internal emitter inductance measured 5mm (0.197 in.) from case	-	-	-	-	nH
			-	-	-	
$I_{C(SC)}$	Short circuit collector current Max. 1000 short circuits Time between short circuits: $\geq 1.0s$	$V_{GE} = 15V, V_{CC} \leq 400V, t_{sc} \leq 5\mu s, T_{vj} \leq 150^{\circ}\text{C}$	-	-	-	A
			-	-	-	

■ IGBT Characteristic, at $T_{vj} = 25^{\circ}\text{C}$

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{CC} = 400\text{V},$ $I_C = 70\text{A},$ $V_{GE} = 0.0/15\text{V},$ $R_g = 12\Omega$	-	25	-	ns
t_r	Turn-On Rise Time		-	130	-	
$t_{d(off)}$	Turn-Off Delay Time		-	82	-	
t_f	Turn-Off Fall Time		-	57	-	
E_{on}	Turn-on energy		-	2.86	-	mJ
E_{off}	Turn-off energy		-	1.03	-	
E_{ts}	Total switching energy		-	TBC	-	
t_{rr}	Diode reverse recovery time	$I_F = 75\text{A},$ $V_R = 300\text{V},$ $d_i/d_t = 600\text{A}/\mu\text{s}$	-	156	-	ns
Q_{rr}	Diode reverse recovery charge		-	1.28	-	μC
I_{rrm}	Diode peak reverse recovery current		-	16	-	A
d_{irr}/dt	Diode peak rate of fall of reverse recovery current during t_b		-	TBC	-	$\text{A}/\mu\text{C}$

■ Characteristic Curve

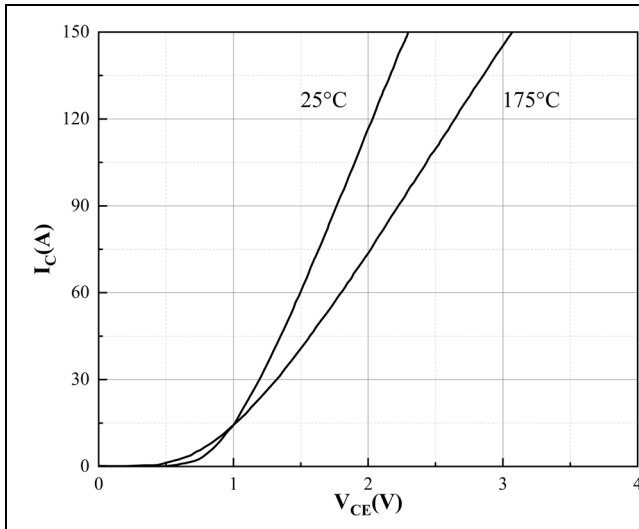


Figure 1. Typical Output Characteristics
 $V_{GE} = 15V$

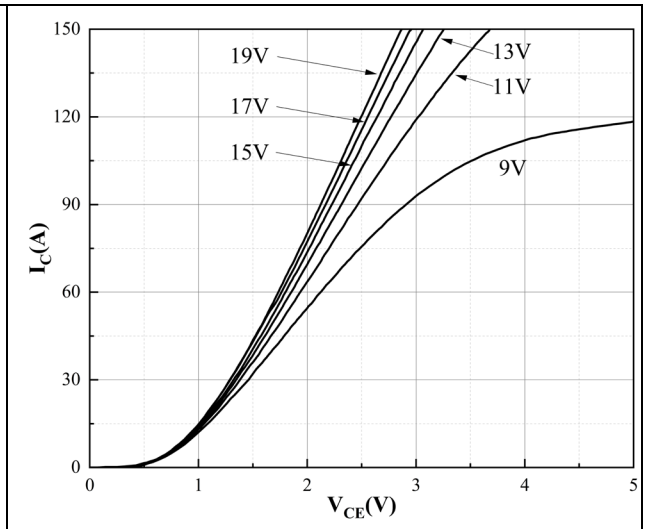


Figure 2. Typical Output Characteristics
 $T_{vj} = 175^{\circ}C$

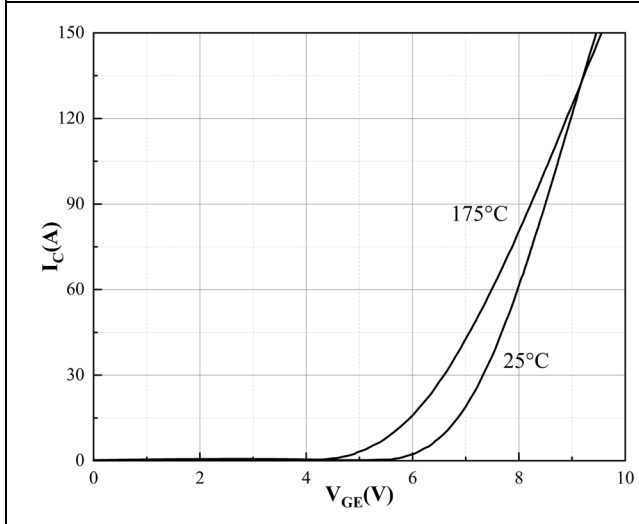


Figure 3. Typical Transfer Characteristics
 $V_{CE} = 20V$

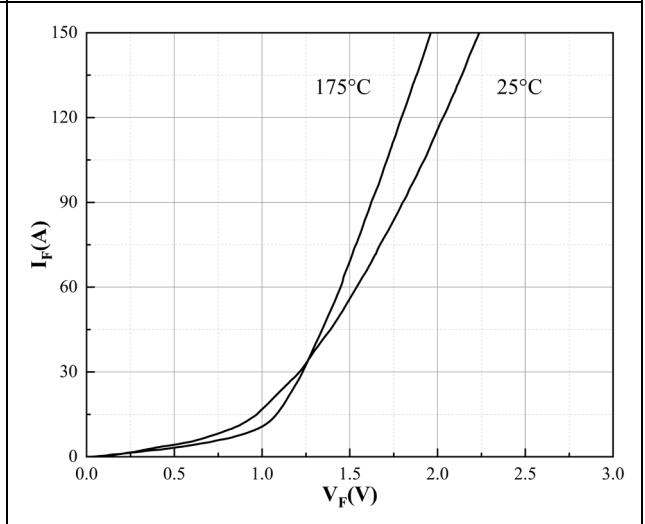


Figure 4. Forward Characteristic Of Diode

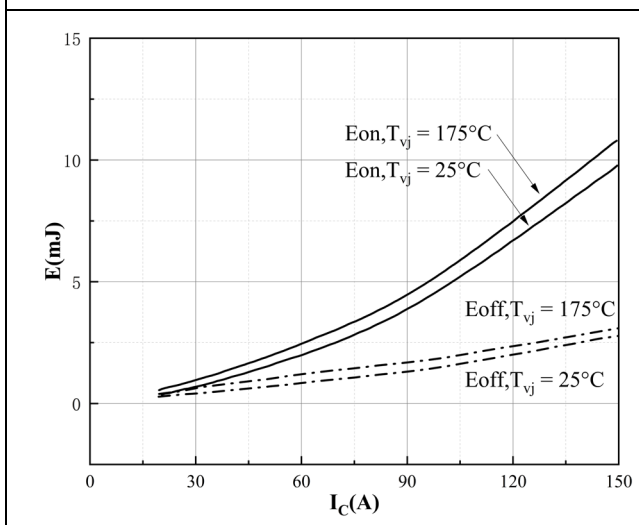


Figure 5. Switching Losses Of IGBT
 $V_{GE} = \pm 15V, R_{gon} = 8\Omega, R_{goff} = 8\Omega, V_{CE} = 300V$

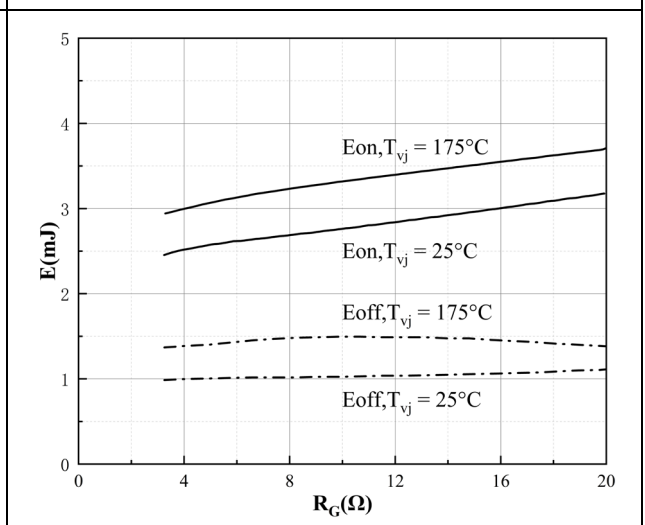


Figure 6. Switching Losses Of IGBT
 $V_{GE} = \pm 15V, I_C = 75A, V_{CE} = 300V$

■ Characteristic Curve

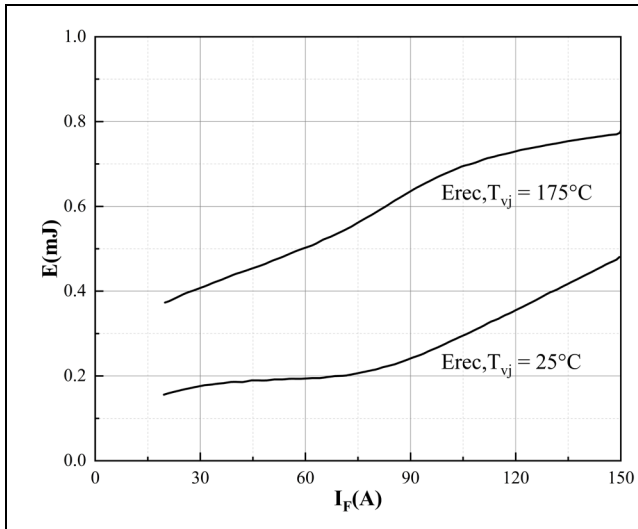


Figure 7. Switching Losses Of Diode
 $R_{gon} = 8\Omega$, $V_{CE} = 300\text{V}$

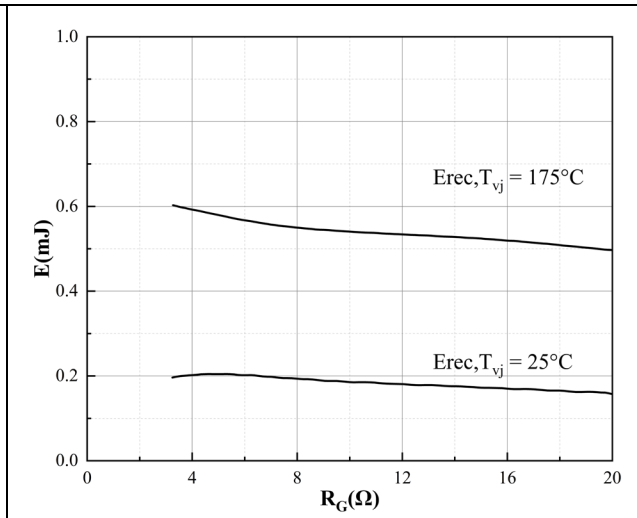


Figure 8. Switching Losses Of Diode
 $I_F = 75\text{A}$, $V_{CE} = 300\text{V}$

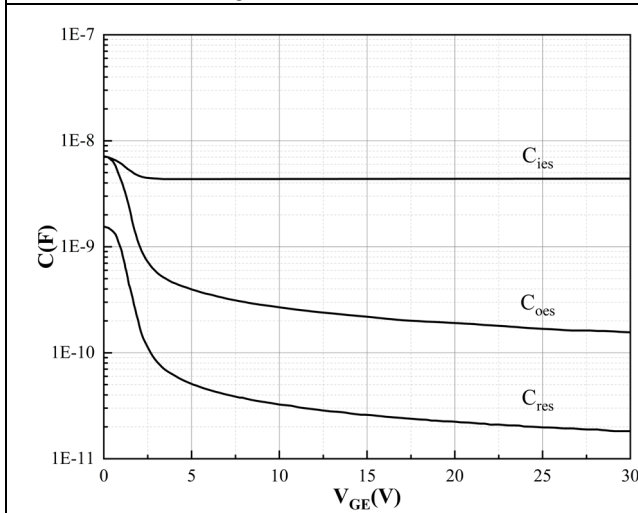
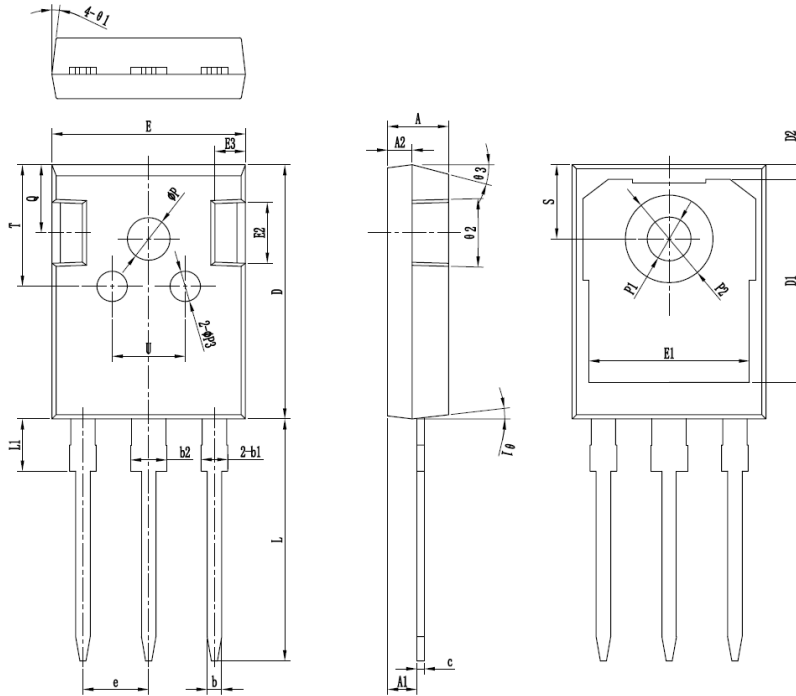


Figure 9. Typical Capacitance

Package Information

TO-247



符号	单位: mm		
	MIN	NOM	MAX
*A	4.90	5.00	5.10
*A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
*b	1.15	1.20	1.25
*b1	1.95	2.10	2.25
*b2	2.95	3.10	3.25
*c	0.55	0.60	0.65
*D	20.90	21.00	21.10
D1	16.35	16.55	16.75
D2	1.05	1.20	1.35
*E	15.70	15.80	15.90
E1	13.10	13.25	13.40
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
*e	5.40	5.44	5.48
*L	19.80	19.92	20.10
*L1	-	-	4.30
*ΦP	3.70	3.80	3.90
*ΦP1	3.50	3.60	3.70
ΦP2	7.00	7.20	7.40
ΦP3	2.40	2.50	2.60
Q	5.60	5.80	6.00
*S	6.05	6.15	6.26
J	9.80	10.00	10.20
U	6.00	6.20	6.40
θ1	5°	7°	9°
θ2	1°	3°	5°
θ3	13°	15°	17°