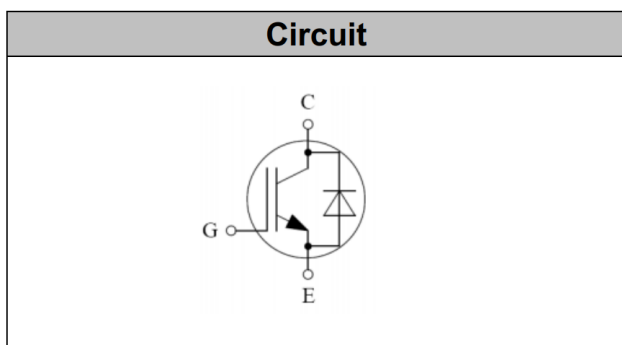


IGBT Discrete

V_{CE}	650	V
I_C	50	A
$V_{CE(SAT)} I_C=50A$	1.6	V



Applications

- Industrial UPS
- Energy Storage
- Charger

Features

- Low gate charge
- Maximum junction temperature 175°C
- Low EMI
- Very soft, fast recovery full current anti-parallel diode
- RoHS compliant

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter Breakdown Voltage	V_{CE}	650	V
DC Collector Current, limited by T_{jmax} $T_C=25^\circ C$ $T_C=100^\circ C$	I_C	100 50	A
Diode Forward Current, limited by T_{jmax} $T_C=25^\circ C$ $T_C=100^\circ C$	I_F	100 50	A
Continuous Gate-Emitter Voltage	V_{GE}	± 20	V
Pulsed Collector Current, $V_{GE}=15V$, t_p limited by T_{jmax}	I_{CM}	200	A
Power Dissipation, $T_j=175^\circ C$ $T_C=25^\circ C$ $T_C=100^\circ C$	P_{tot}	258 129	W
Operating Junction Temperature	T_j	-40...+175	°C
Storage Temperature	T_s	-55...+150	°C
Soldering Temperature, wave soldering 1.6mm(0.063in.) from case for 10s	-	260	°C

Thermal Resistance

Parameter	Symbol	Max. Value	Unit
IGBT Thermal Resistance, Junction - Case	$R_{th(j-c)}$	0.58	K/W
Diode Thermal Resistance, Junction - Case	$R_{th(j-c)}$	0.65	K/W
Thermal Resistance, Junction - Ambient	$R_{th(j-a)}$	40	K/W

Electrical Characteristics of the IGBT ($T_j = 25^\circ\text{C}$ unless otherwise specified):

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-Emitter Breakdown Voltage	BV_{CES}	$V_{GE}=0V, I_C=250\mu A$	650	-	-	V
Gate Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=250\mu A$	3.2	4.0	4.8	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=50A$ $T_j=25^\circ\text{C},$ $T_j=125^\circ\text{C}$	- -	1.60 1.93	2.1 -	V
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=650V, V_{GE}=0V$ $T_j=25^\circ\text{C},$	-	-	50	μA
Gate-Emitter Leakage Current	I_{GES}	$V_{CE}=0V, V_{GE}=\pm 20V$	-	-	100	nA
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V,$ $f=1\text{MHz}$	-	1930	-	pF
Output Capacitance	C_{oes}		-	140	-	
Reverse Transfer Capacitance	C_{res}		-	10.7	-	
Gate Charge	Q_G	$V_{CC}=520V, I_C=50A,$ $V_{GE}=15V$	-	71	-	nC
Gate-Emitter Charge	Q_{GE}		-	10	-	
Gate-Collector Charge	Q_{GC}		-	22.5	-	

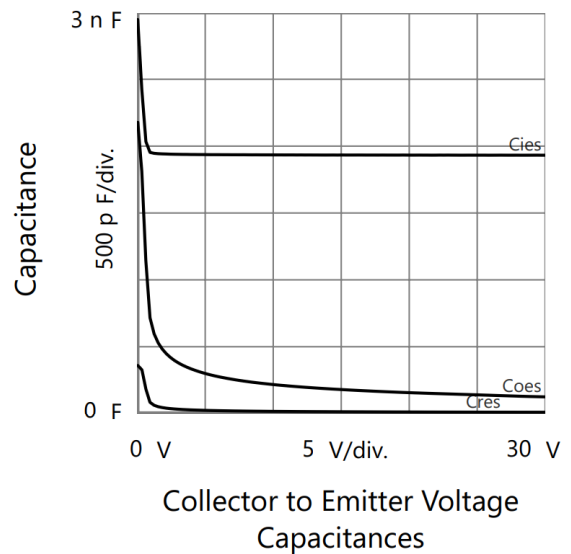
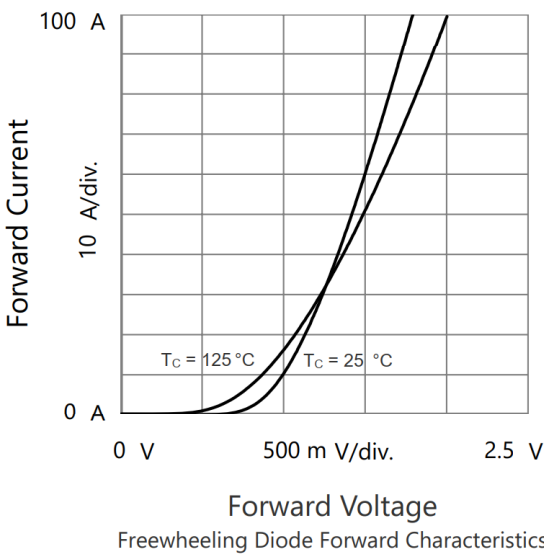
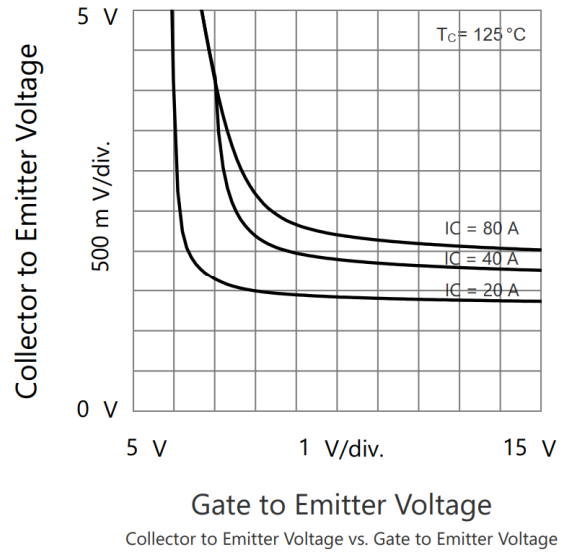
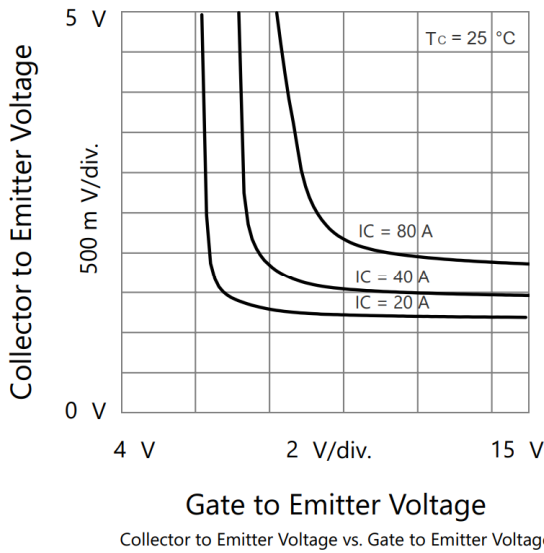
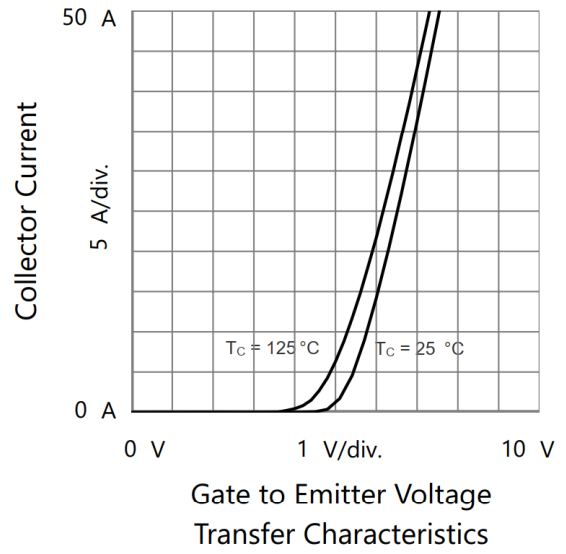
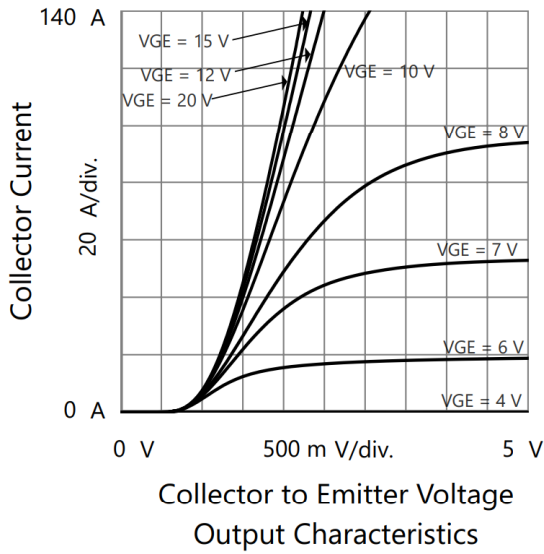
Switching Characteristic, Inductive Load ($T_j = 25^\circ\text{C}$ unless otherwise specified):

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-on Delay Time	$t_{d(on)}$	$V_{CC} = 400\text{V}, I_C = 50\text{A},$ $V_{GE} = 15\text{V}$ $R_g = 12\Omega$	-	17	-	ns
Rise Time	t_r		-	29	-	ns
Turn-on Energy	E_{on}		-	1.35	-	mJ
Turn-off Delay Time	$t_{d(off)}$		-	111	-	ns
Fall Time	t_f		-	34	-	ns
Turn-off Energy	E_{off}		-	0.51	-	mJ
Turn-on Delay Time	$t_{d(on)}$		$V_{CC} = 400\text{V}, I_C = 25\text{A},$ $V_{GE} = 15\text{V}$ $R_g = 12\Omega$	-	18	-
Rise Time	t_r	-		12	-	ns
Turn-on Energy	E_{on}	-		0.49	-	mJ
Turn-off Delay Time	$t_{d(off)}$	-		120	-	ns
Fall Time	t_f	-		20	-	ns
Turn-off Energy	E_{off}	-		0.21	-	mJ

Electrical Characteristics of the DIODE ($T_j = 25^\circ\text{C}$ unless otherwise specified):

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Diode Forward Voltage	V_F	$I_F = 50\text{A}$	-	1.45	-	V
Reverse Recovery Time	T_{rr}	$V_R = 400\text{V}, I_F = 50\text{A}$ $dI_F/dt = 1000\text{A}/\mu\text{s}$	-	141	-	ns
Reverse Recovery Charge	Q_{rr}		-	1.49	-	μC
Reverse Recovery Time	T_{rr}	$V_R = 400\text{V}, I_F = 25\text{A}$ $dI_F/dt = 1000\text{A}/\mu\text{s}$	-	125	-	ns
Reverse Recovery Charge	Q_{rr}		-	1.10	-	μC

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

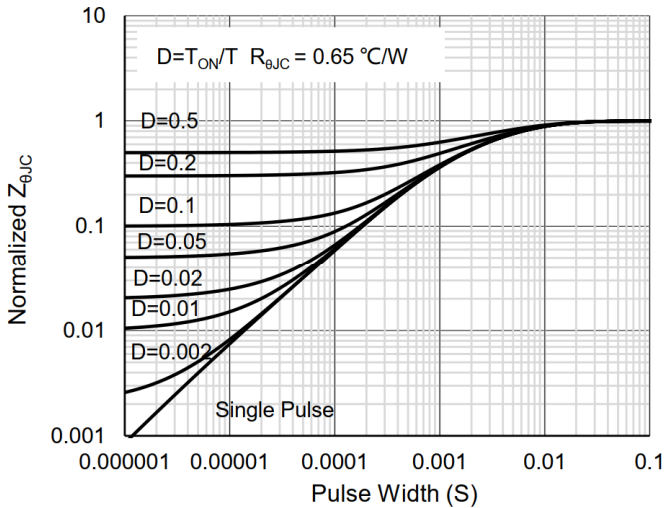
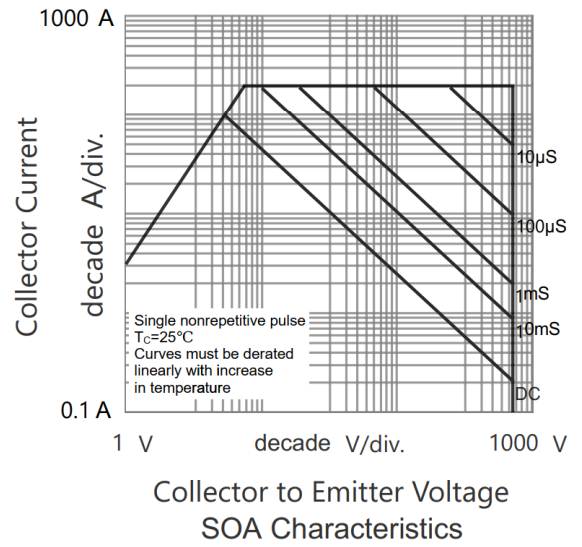
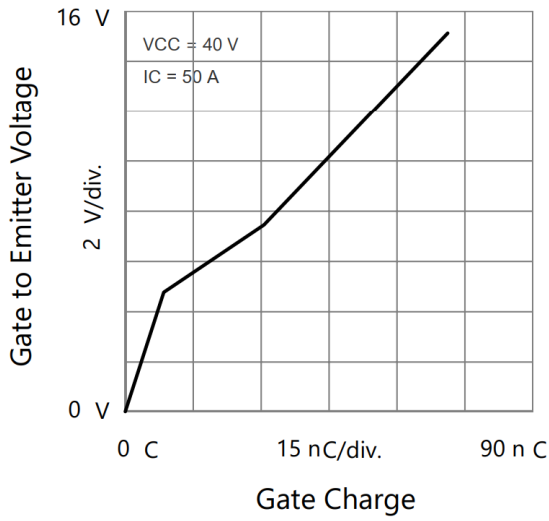
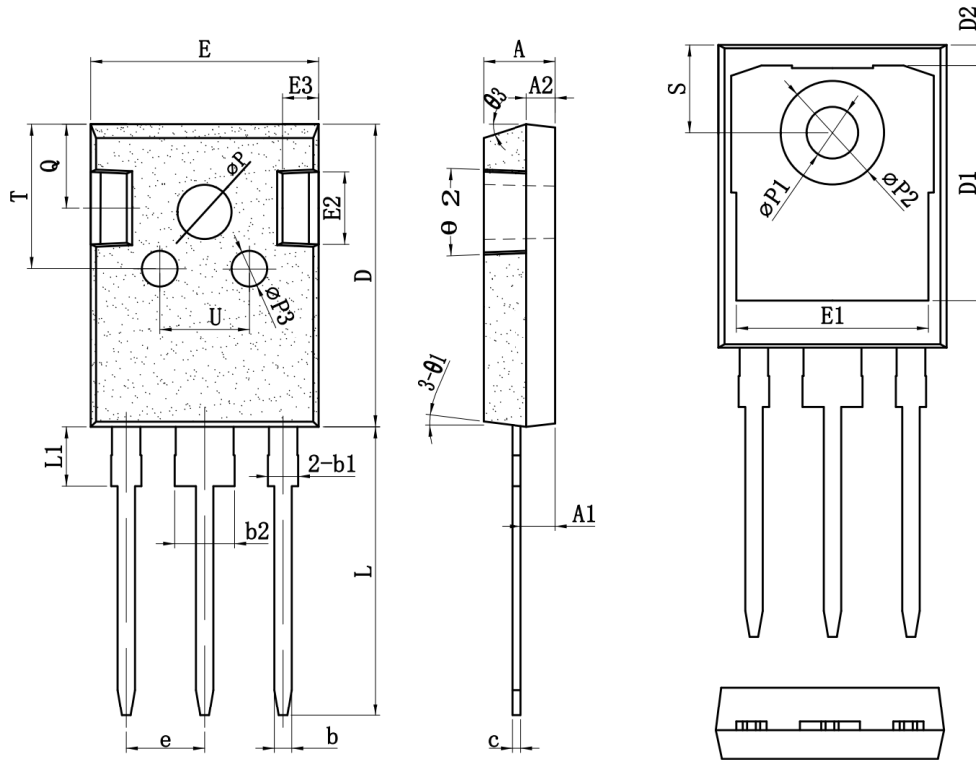


Figure 19: Normalized Maximum Diode Transient Thermal Impedance

TO-247_3L PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX	SYMBOL	MIN	TYP	MAX
A	4.60	5.00	5.40	e	2.10	5.44	5.70
A1	2.10	2.41	2.70	L	19.00	19.98	21.00
A2	1.70	2.00	2.30	L1	-	-	4.50
b	1.00	1.20	1.40	ΦP	3.30	3.70	4.00
b1	1.80	2.10	2.40	$\Phi P1$	3.25	3.55	3.85
b2	2.80	3.10	3.40	$\Phi P2$	6.80	7.18	7.60
C	0.45	0.60	0.75	$\Phi P3$	2.30	2.50	3.30
D	19.00	21.00	23.00	Q	5.50	5.80	6.30
D1	16.00	16.55	17.00	S	5.60	6.15	6.30
D2	0.95	1.20	1.45	T	9.50	10.00	10.50
E	15.70	15.80	16.50	U	6.00	-	8.00
E1	12.80	13.25	13.70	$\theta 1$	5°	7°	9°
E2	4.20	5.00	5.30	$\theta 2$	1°	3°	5°
E3	2.20	2.50	2.80	$\theta 3$	13°	15°	17°

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