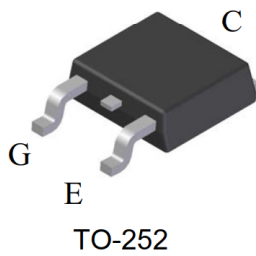
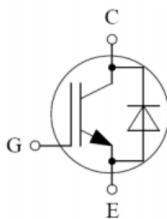


IGBT Discrete



V_{CE}	650	V
$I_C(T_C=100^\circ\text{C})$	6	A
$V_{CE(SAT)} I_C=6\text{A}$	1.7	V

Circuit



Applications

- Motor Drives
- Fan, Pumps, Vacuum Cleaner
- Home appliances

Features

- High ruggedness performance
- Very tight parameter distribution
- High efficiency for motor control
- Excellent current sharing in parallel operation
- RoHS compliant

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter Breakdown Voltage	V_{CE}	650	V
DC Collector Current, limited by T_{jmax} $T_C=25^\circ\text{C}$ $T_C=100^\circ\text{C}$	I_C	12 6	A
Diode Forward Current, limited by T_{jmax} $T_C=25^\circ\text{C}$ $T_C=100^\circ\text{C}$	I_F	12 6	A
Continuous Gate-Emitter Voltage	V_{GE}	± 20	V
Pulsed Collector Current, $V_{GE}=15\text{V}$, t_p limited by T_{jmax}	I_{CM}	24	A
Power Dissipation, $T_C=25^\circ\text{C}$	P_{tot}	73	W
Operating Junction Temperature	T_j	-55...+175	$^\circ\text{C}$
Storage Temperature	T_s	-55...+150	$^\circ\text{C}$
Soldering Temperature, wave soldering 1.6mm(0.063in.) from case for 10s		300	$^\circ\text{C}$

Thermal Resistance

Parameter	Symbol	Max. Value	Unit
IGBT Thermal Resistance, Junction - Case	$R_{th(j-c)}$	2.0	K/W
Diode Thermal Resistance, Junction - Case	$R_{th(j-c)}$	4.0	K/W
Thermal Resistance, Junction - Ambient	$R_{th(j-a)}$	90	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	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=150\mu A$	5.2	6.2	7.2	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=6A$ $T_j=25^\circ\text{C},$ $T_j=150^\circ\text{C}$	- -	1.7 2.1	-	V
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=650V, V_{GE}=0V$ $T_j=25^\circ\text{C},$ $T_j=150^\circ\text{C}$	- -	- -	0.01 1	mA
Gate-Emitter Leakage Current	I_{GES}	$V_{CE}=0V, V_{GE}=\pm 20V$	-	-	100	nA
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V,$ $f=1\text{MHz}$	-	476	-	pF
Output Capacitance	C_{oes}		-	20	-	
Reverse Transfer Capacitance	C_{res}		-	4.6	-	
Gate Charge	Q_G	$V_{CC}=520V, I_C=6A,$ $V_{GE}=15V$	-	20.3	-	nC
Gate-Emitter Charge	Q_{GE}		-	3.3	-	
Gate-Collector Charge	Q_{GC}		-	7.8	-	

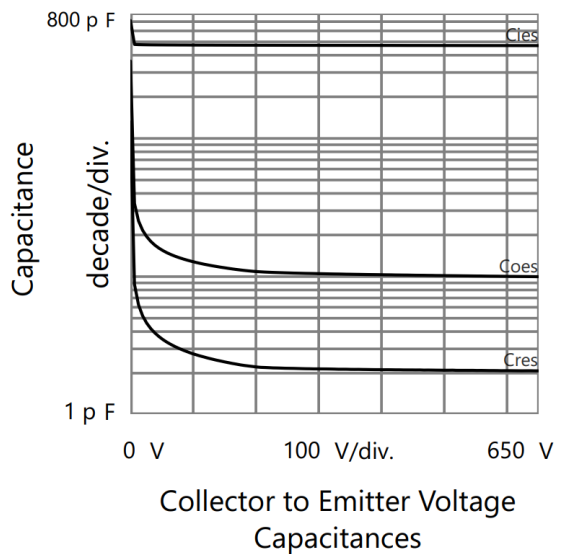
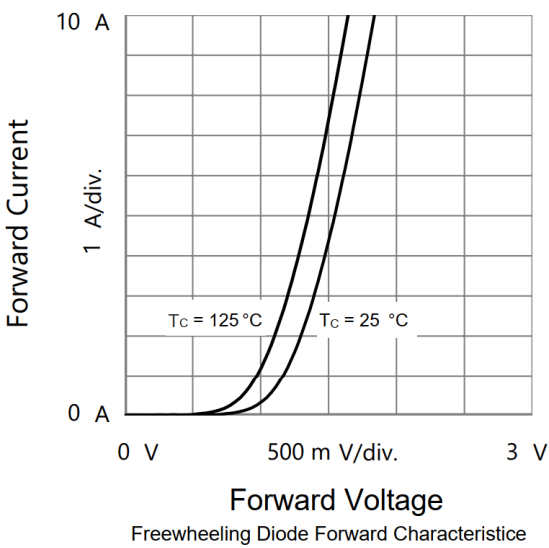
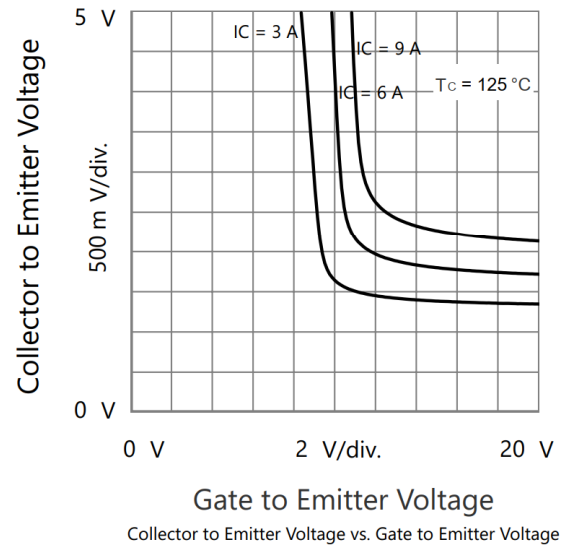
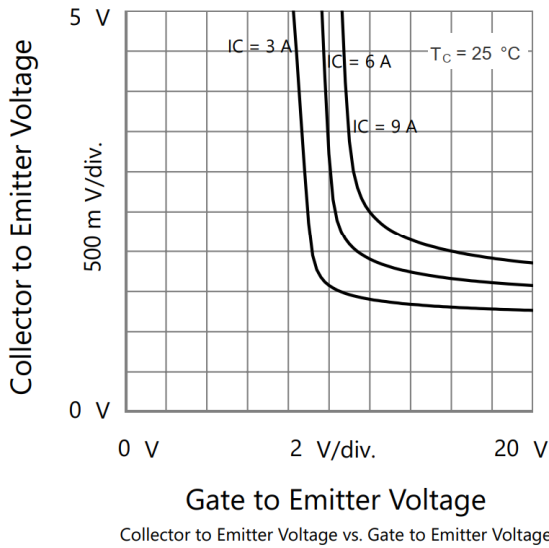
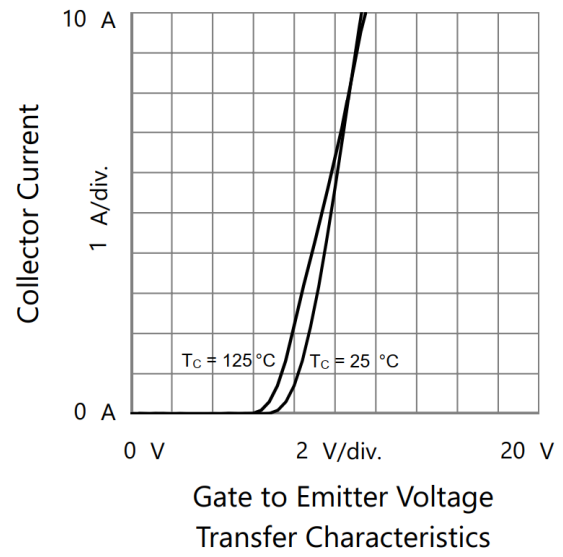
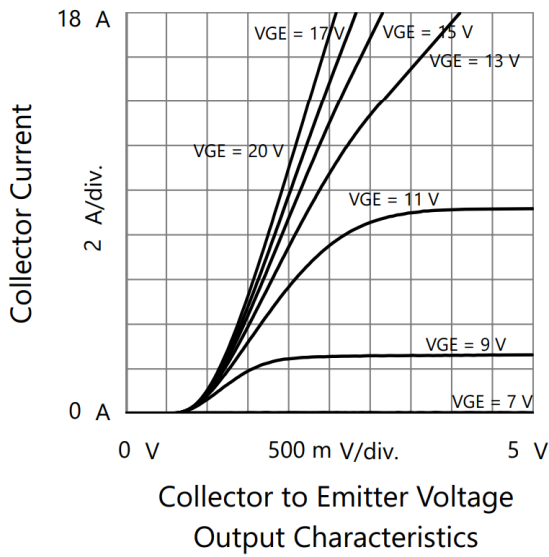
Switching Characteristic, Inductive Load ($T_J = 25^\circ\text{C}$ unless otherwise specified):

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-on Delay Time	$t_{d(on)}$	$T_C = 25^\circ\text{C}$, $V_{CC} = 400\text{V}$, $I_C = 6\text{A}$, $V_{GE} = 15\text{V}$ $R_g = 10\Omega$	-	10	-	ns
Rise Time	t_r		-	8	-	ns
Turn-on Energy	E_{on}		-	0.11	-	mJ
Turn-off Delay Time	$t_{d(off)}$		-	79	-	ns
Fall Time	t_f		-	56	-	ns
Turn-off Energy	E_{off}		-	0.1	-	mJ
Turn-on Delay Time	$t_{d(on)}$	$T_C = 150^\circ\text{C}$, $V_{CC} = 400\text{V}$, $I_C = 6\text{A}$, $V_{GE} = 15\text{V}$ $R_g = 10\Omega$	-	11	-	ns
Rise Time	t_r		-	10	-	ns
Turn-on Energy	E_{on}		-	0.16	-	mJ
Turn-off Delay Time	$t_{d(off)}$		-	108	-	ns
Fall Time	t_f		-	89	-	ns
Turn-off Energy	E_{off}		-	0.16	-	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	$I_F = 6\text{A}$	-	1.6	-	V
Reverse Recovery Time	T_{rr}	$T_C = 25^\circ\text{C}$, $I_F = 6\text{A}$, $V_R = 400\text{V}$, $dI/dt = -500\text{A}/\mu\text{s}$	-	55	-	ns
Reverse Recovery Charge	Q_{rr}		-	306	-	nC
Reverse Recovery Time	T_{rr}	$T_C = 150^\circ\text{C}$, $I_F = 6\text{A}$, $V_R = 400\text{V}$, $dI/dt = -500\text{A}/\mu\text{s}$	-	98	-	ns
Reverse Recovery Charge	Q_{rr}		-	529	-	nC

TYPICAL CHARACTERISTICS(25 °C, unless otherwise noted)



TYPICAL CHARACTERISTICS(25 °C, unless otherwise noted)

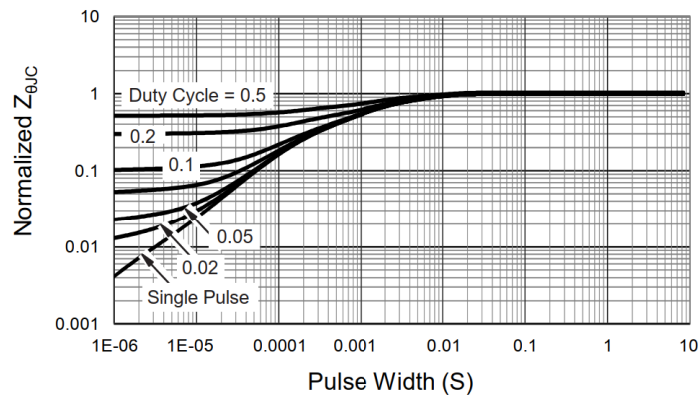
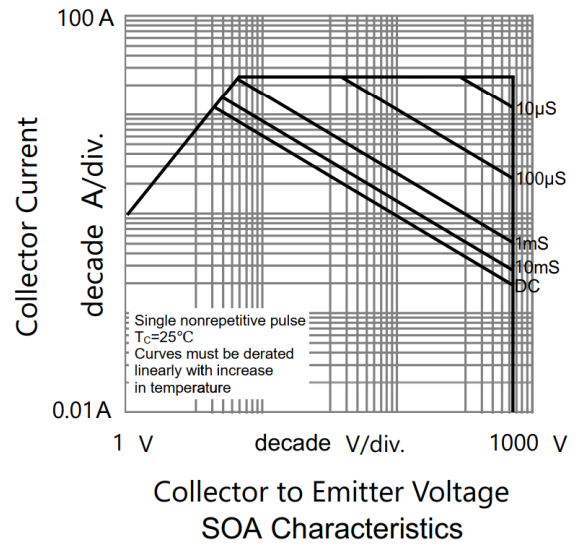
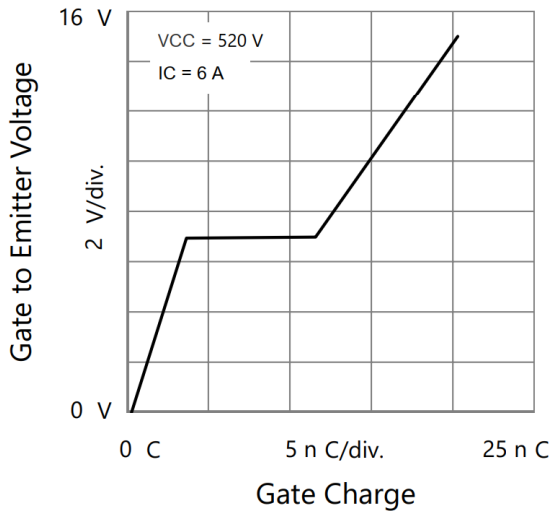
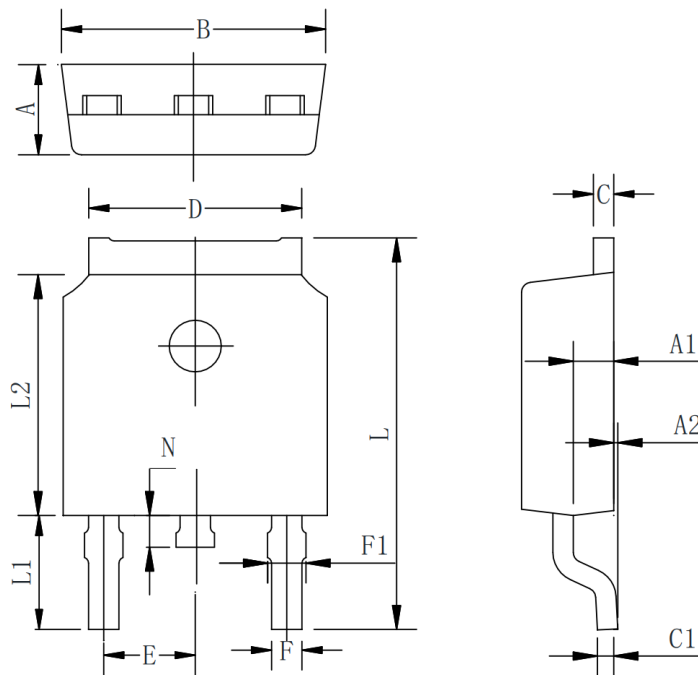


Figure 19: Normalized Maximum Diode Transient Thermal Impedance

TO-252-2L PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

Symbol	Min	Typ	Max
A	2.10	2.30	2.50
A1	0.88	1.01	1.16
A2	0.00	0.15	0.28
B	6.40	6.60	6.80
C	0.42	0.50	0.63
C1	0.42	0.50	0.63
D	5.08	5.32	5.65
E	2.286 TYP		
F	0.63	0.76	0.89
F1	0.64	0.86	1.08
L	9.30	9.90	10.80
L1	2.4	2.8	3.6
L2	5.90	6.10	6.55
N	0.57	0.80	1.05

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