MG75HF12TLC1

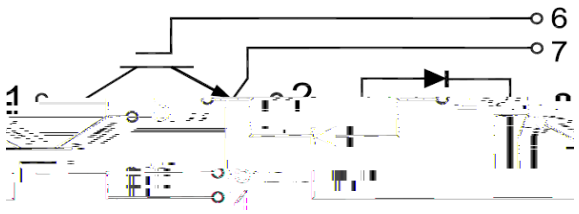
IGBT Modules

V_{CES}	1200V
I_C	75A

Applications

- Inverter for motor drive
- AC and DC servo drive amplifier
- UPS (Uninterruptible Power Supplies)
- Soft switching welding machine

Circuit



Features

- Low $V_{ce(sat)}$ with Trench technology
- $V_{ce(sat)}$ with positive temperature coefficient
- High short circuit capability(10us)
- Including ultra fast & soft recovery anti-parallel FWD
- Low inductance
- Maximum junction temperature 175

IGBT

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V_{CES}	V_{GE}=0V, I_C =1mA, T_{vj}=25	1200	V
Continuous Collector Current	I_C	T_c=100	75	A
Repetitive Peak Collector Current	I_{CRM}	tp=1ms	150	A
Gate-Emitter Voltage	V_{GES}	T_{vj}=25	20	V
Total Power Dissipation	P_{tot}	T_c=25 T_{vjmax}=175	530	W

Characteristic values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}$, I_C =3mA,T_{vj}=25	5.0	6.2	7.0	V
Collector-Emitter Cut-off Current	I_{CES}	V_{CE}=1200V,V_{GE}=0V,T_{vj}=25			1.0	mA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	Ic=75A,V_{GE}=15V, T_{vj}=25		1.85		V
		Ic=75A,V_{GE}=15V, T_{vj}=125		2.05		
Input Capacitance	C_{ies}	V_{CE}=25V,V_{GE} =0V, f=1MHz,T_{vj}=25		5.52		nF
Reverse Transfer Capacitance	C_{res}			0.26		nF
Gate-Emitter leakage current	I_{GES}	V_{CE}=0 V, V_{GE}=20V,T_{vj} = 25			400	nA
Turn-on Delay Time	$t_{d(on)}$	I_C =75 A V_{CE} = 600 V V_{GE} = ± 15V R_G = 10Ω T_{vj}=25		305		ns
Rise Time	t_r			67		ns
Turn-off Delay Time	$t_{d(off)}$			328		ns
Fall Time	t_f			187		ns
Energy Dissipation During Turn-on Time	E_{on}			6.7		mJ
Energy Dissipation During Turn-off Time	E_{off}			4.3		mJ
Turn-on Delay Time	$t_{d(on)}$	I_C =75 A V_{CE} = 600 V V_{GE} = ± 15V R_G = 10Ω T_{vj}=125		311		ns
Rise Time	t_r			70		ns
Turn-off Delay Time	$t_{d(off)}$			347		ns
Fall Time	t_f			337		ns
Energy Dissipation During Turn-on Time	E_{on}			9.7		mJ
Energy Dissipation During Turn-off Time	E_{off}			7.0		mJ
SC Data	I_{sc}	T_p≤10us,V_{GE}=15V, Tv_j=150 ,V_{cc}=600V, V_{CEM}≤1200V		420		A

Diode

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	T_{vj}=25	1200	V
Continuous DC Forward Current	I_F		75	A
Repetitive Peak Forward Current	I_{FRM}	t_p=1ms	150	A

Characteristic values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	I_F=75A,T_{vj}=25		2.10		V
		I_F=75A,T_{vj}=125		2.00		
Recovered Charge	Q_{rr}	I_F =75A V_R=600V -di$_F$/dt =1200A/us T_{vj}=25		4.8		uC
Peak Reverse Recovery Current	I_{rr}			60		A
Reverse Recovery Energy	E_{rec}			3.8		mJ
Recovered Charge	Q_{rr}	I_F =75 A V_R=600V -di$_F$/dt =1200A/us T_{vj}=125		10.2		uC
Peak Reverse Recovery Current	I_{rr}			77		A
Reverse Recovery Energy	E_{rec}			5.7		mJ

Module Characteristics

T_C=25°C unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation voltage	V_{isol}	t=1min,f=50Hz	2500			V
Maximum Junction Temperature	T_{jmax}				175	
Operating Junction Temperature	$T_{vj\ op}$		-40		150	
Storage Temperature	T_{stg}		-40		125	
Thermal Resistance Junction-to Case	R_{JC}	per IGBT			0.26	K/W
		per Diode			0.42	
Thermal Resistance Case-to Sink	R_{CS}	Conductive grease applied		0.05		K/W
Module ElectrodesTorque	M_t	Recommended(M5)	2.5		5.0	N·m
Module-to-SinkTorque	M_s	Recommended(M6)	3.0		5.0	N·m
Weight of Module	G			150		g

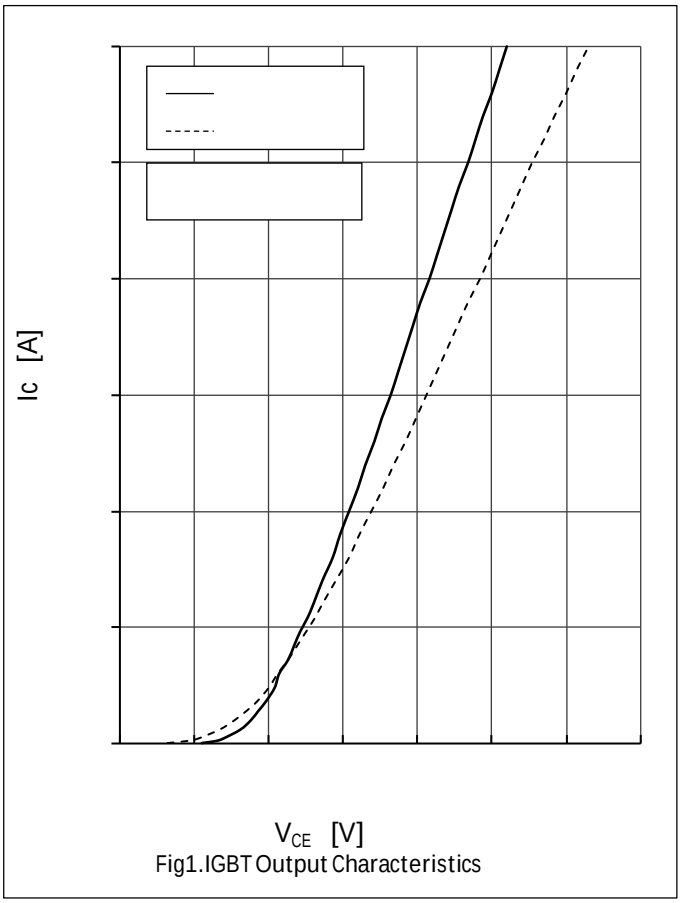


Fig1.IGBT Output Characteristics

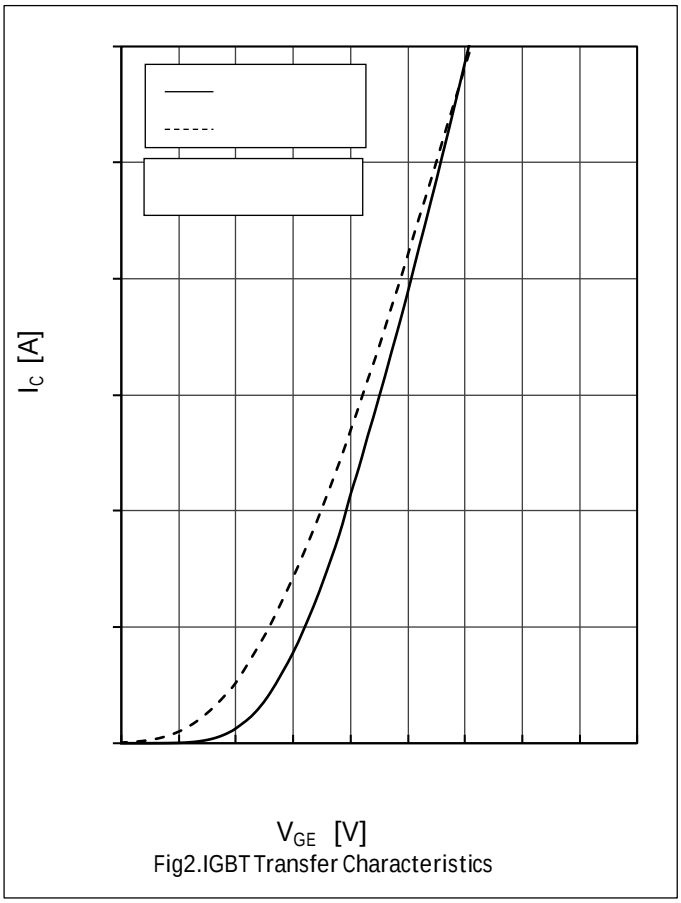


Fig2.IGBT Transfer Characteristics

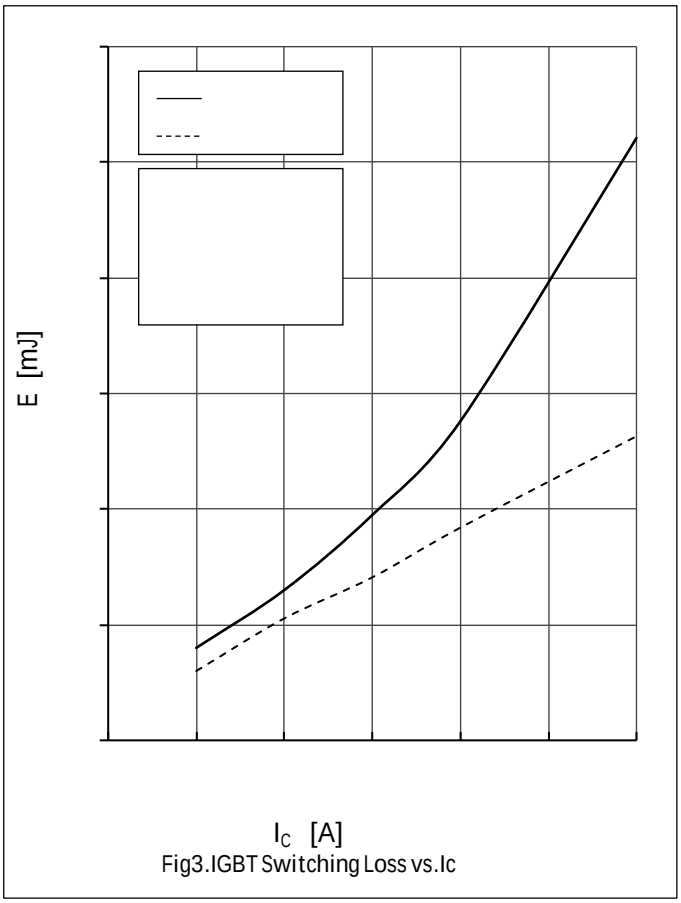


Fig3.IGBT Switching Loss vs.Ic

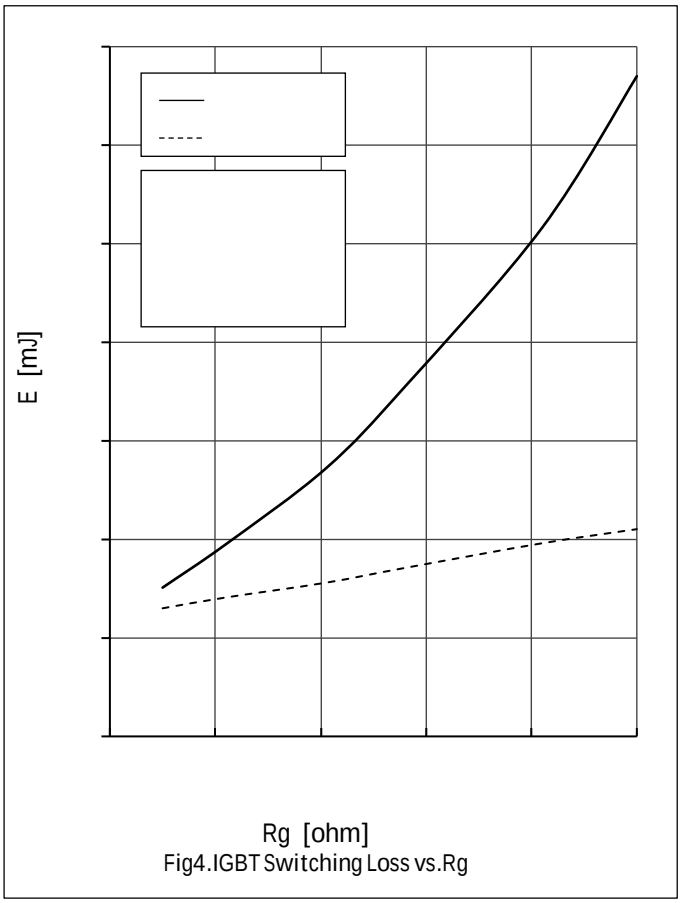


Fig4.IGBT Switching Loss vs.Rg

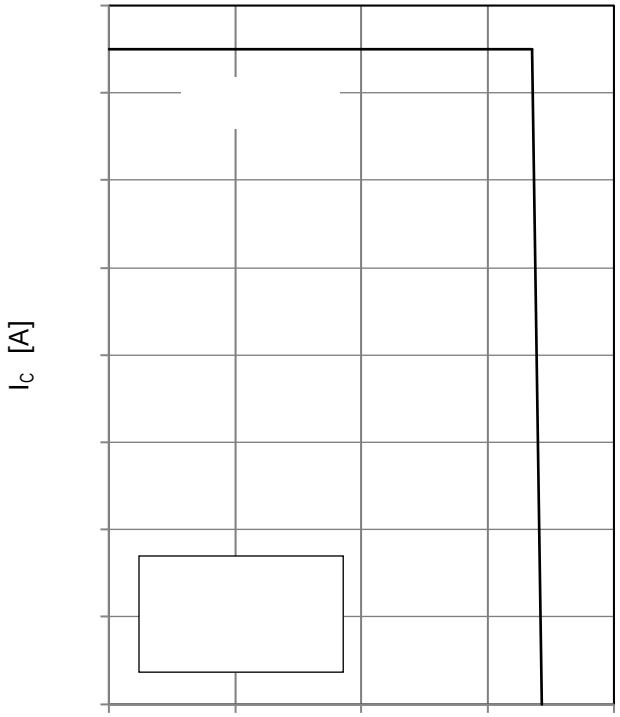


Fig5. RBSOA

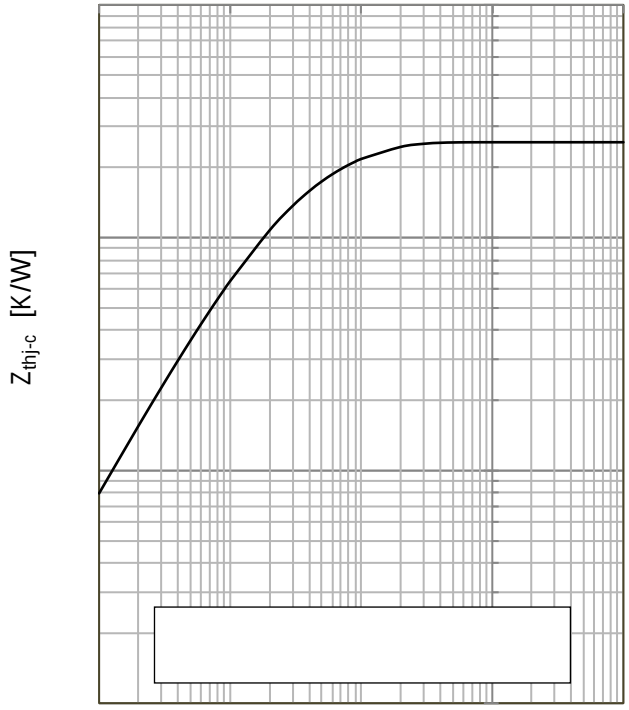


Fig 6. IGBT Transient Thermal Impedance

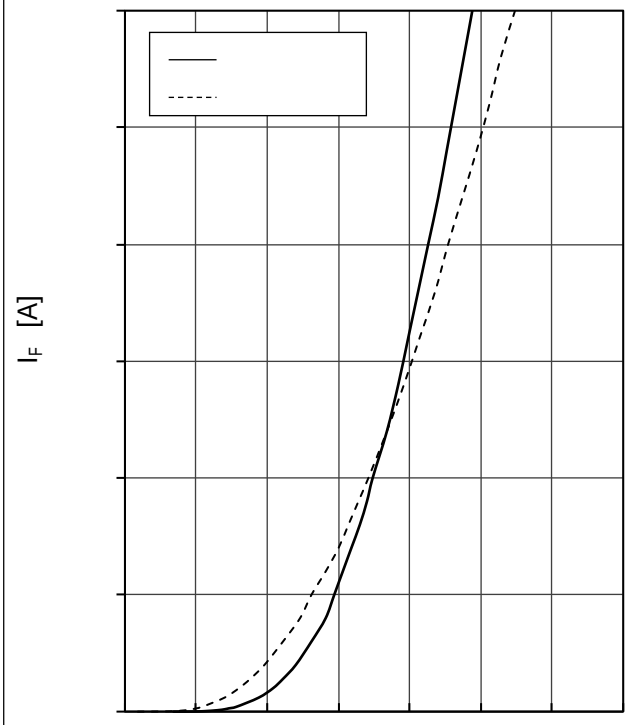


Fig7.Diode Foward Characteristics

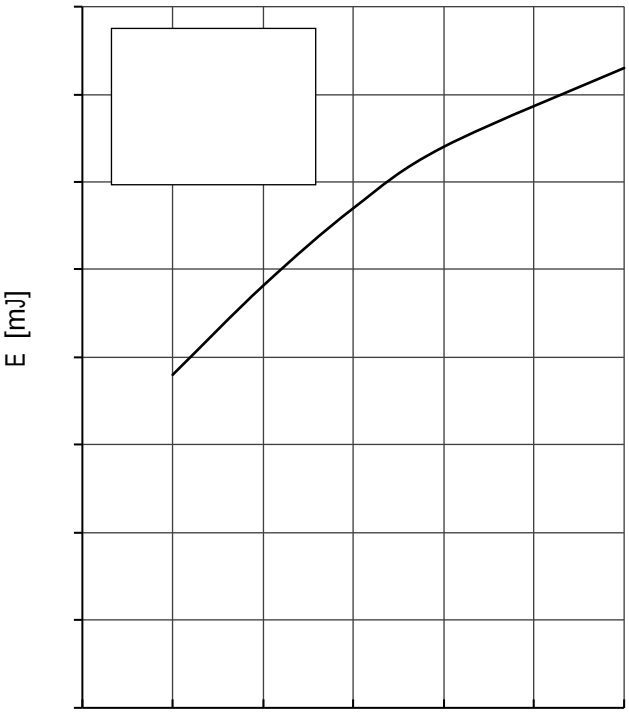


Fig8.Diode Switching Loss vs.I_F

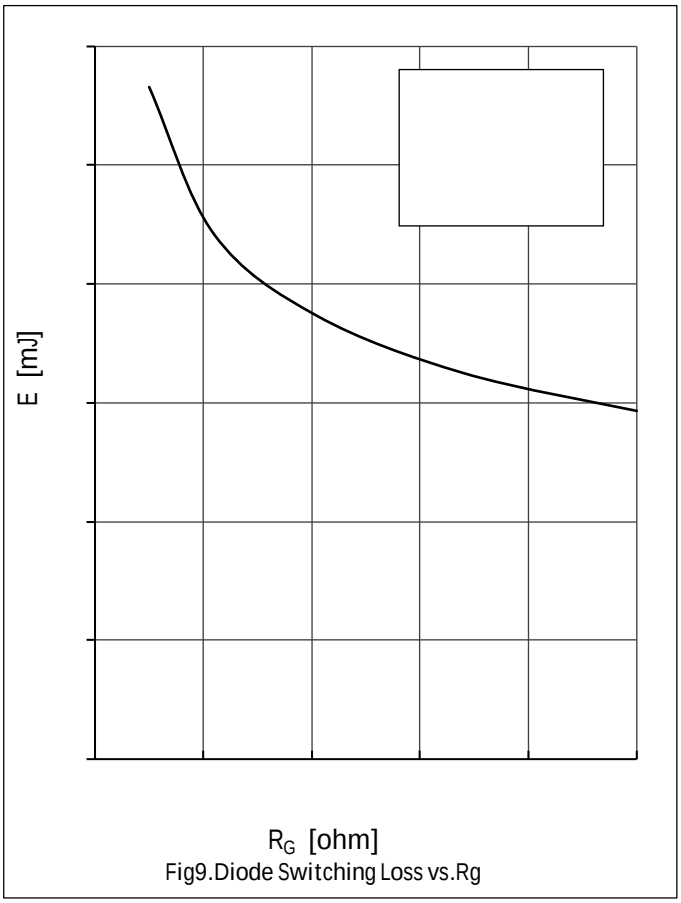


Fig9.Diode Switching Loss vs.Rg

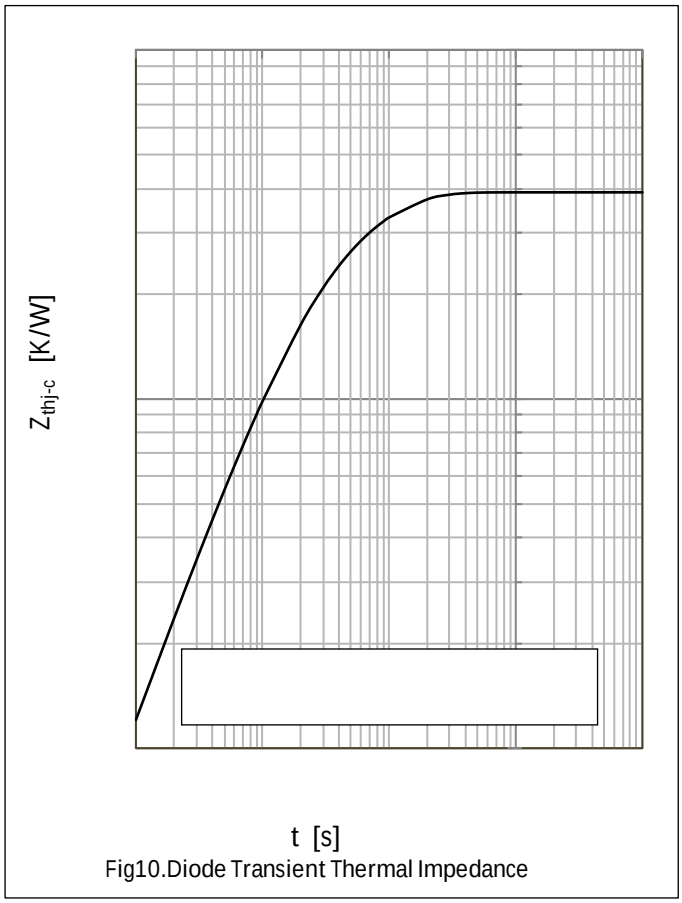
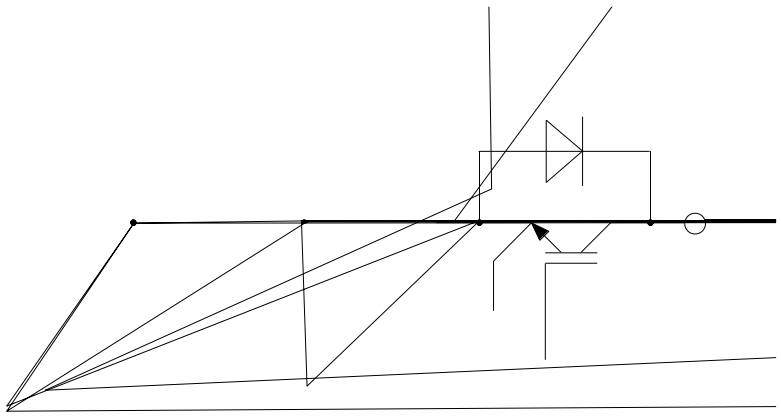


Fig10.Diode Transient Thermal Impedance

- **Circuit Diagram**



- **Package Outline Information**

Dimensions in Millimeters