ABSOLUTE MAXIMUM RATINGS (Note 1) T_J = 25°C unless otherwise noted

Rating	Symbol	Value	Unit
BOOST MOSFET			
Drain−Source Voltage	V_{DS}	1200	V
Gate−Source Voltage	V_{GS}	−15/+25	V
Continuous Drain Current (@ V_{GS} = 20 V, T_C = 80°C)	I_D	23	A
Pulsed Drain Current @ T_C = 80°C (T_J = 175°C)	$I_{D(Pulse)}$	69	A
Maximum Power Dissipation @ T_C = 80°C	P_{tot}	69	W
Minimum Operating Junction Temperature	T_{JMIN}	−40	°C
Maximum Operating Junction Temperature	T_{JMAX}	175	°C
BOOST DIODE			
Peak Repetitive Reverse Voltage	V_{RRM}	1200	V
Continuous Forward Current @ T_C = 80°C	I_F	31	A
Surge Forward Current (60 Hz single half−sine wave)	I_{FSM}	93	A
Maximum Power Dissipation @ T_C = 80°C (T_J = 175°C)	P_{tot}	97	W
I^2t − value (60 Hz single half−sine wave)	I^2t	19	A^2s
Minimum Operating Junction Temperature	T_{JMIN}	−40	°C
Maximum Operating Junction Temperature	T_{JMAX}	175	°C
BYPASS DIODE			
Peak Repetitive Reverse Voltage	V_{RRM}	1600	V
Continuous Forward Current @ T_C = 80°C (T_J = 150°C)	I_F	44	A
Repetitive Peak Forward Current (T_C = 80°C, t_p limited by T_{Jmax})	I_{FRM}	132	A
Power Dissipation Per Diode @ T_C = 80°C (T_J = 150°C)	P_{tot}	63	W
Minimum Operating Junction Temperature	T_{JMIN}	−40	°C
Maximum Operating Junction Temperature	T_{JMAX}	150	°C
THERMAL PROPERTIES			
Storage Temperature range	T_{stg}	−40 to 125	°C
INSULATION PROPERTIES			
Isolation test voltage, t = 1 sec, 60 Hz	V_{is}	3000	V_{RMS}
Creepage distance		12.7	mm

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Refer to ELECTRICAL CHARACTERISTICS, RECOMMENDED OPERATING RANGES and/or APPLICATION INFORMATION for Safe Operating parameters.

RECOMMENDED OPERATING RANGES

Parameter	Symbol	Min	Max	Unit
Module Operating Junction Temperature	T_J	−40	(T_{JMAX} − 25)	°C

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

Characteristic	Test Conditions	Symbol	Min	Typ	Max	Unit
BOOST MOSFET CHARACTERISTICS						
Zero Gate Voltage Drain Current	V_{GS} = 0 V, V_{DS} = 1200 V, T_J = 25°C	I_{DSS}	–	–	100	μA

Static Drain−to−Sou1 Tc(GS)T2

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified) (continued)

Characteristic	Test Conditions	Symbol	Min	Typ	Max	Unit
BOOST DIODE CHARACTERISTICS						
Thermal Resistance − chip−to−case	Thermal grease, Thickness = 2.1 Mil ±2%	R_{thJC}	–	0.98	–	K/W
Thermal Resistance − chip−to−	λ = 2.9 W/mK					

TYPICAL CHARACTERISTICS – MOSFET, BOOST DIODE AND BYPASS DIODE

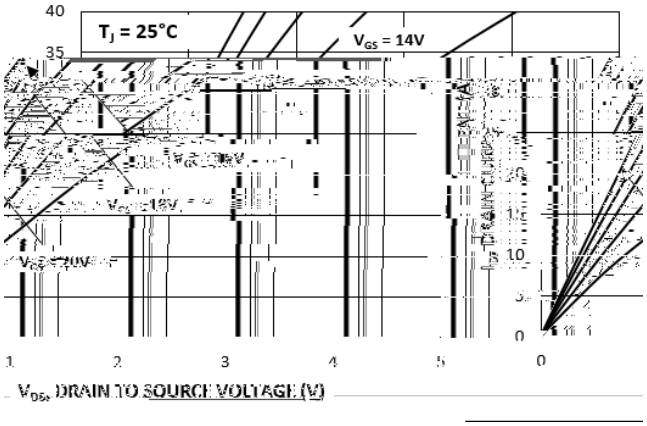


Figure 2. MOSFET On Region Characteristics

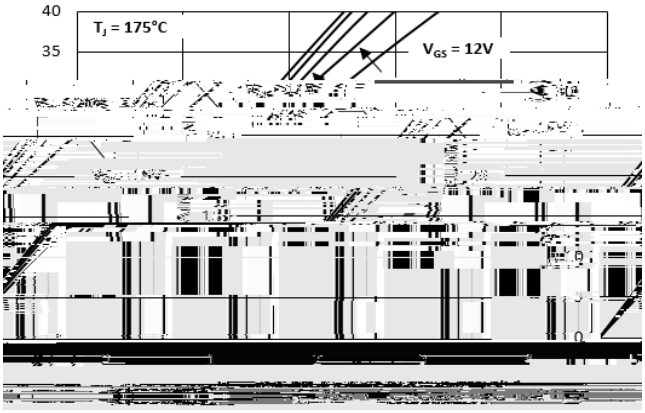


Figure 3. MOSFET On Region Characteristics

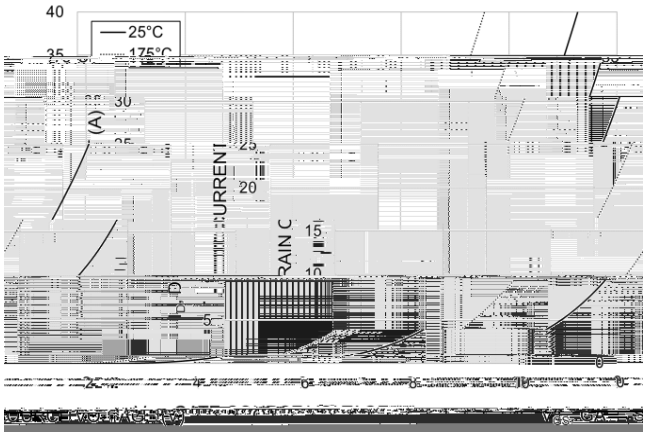


Figure 4. MOSFET Transfer Characteristics

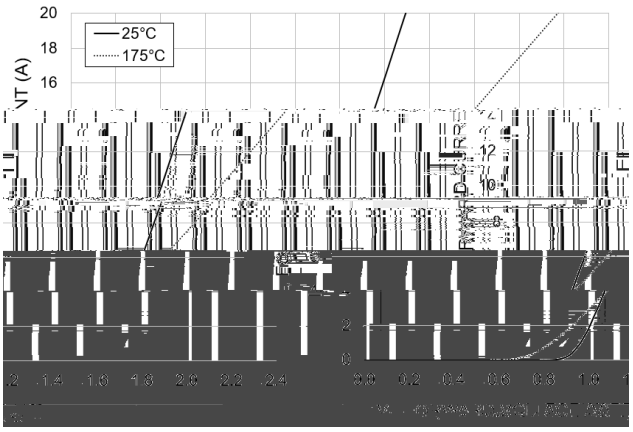


Figure 5. Boost Diode Forward Characteristics

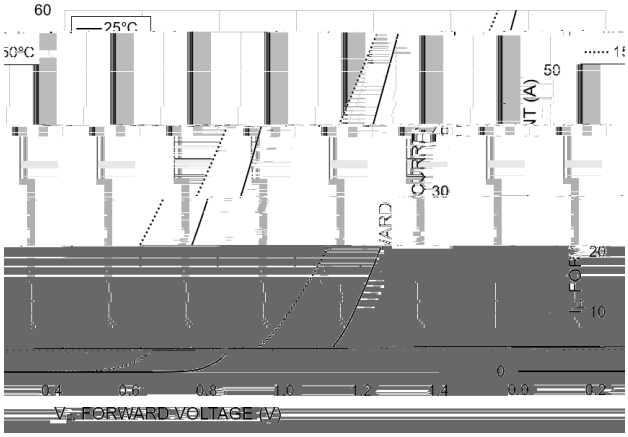


Figure 6. Bypass Diode Forward Characteristics

TYPICAL CHARACTERISTICS – MOSFET

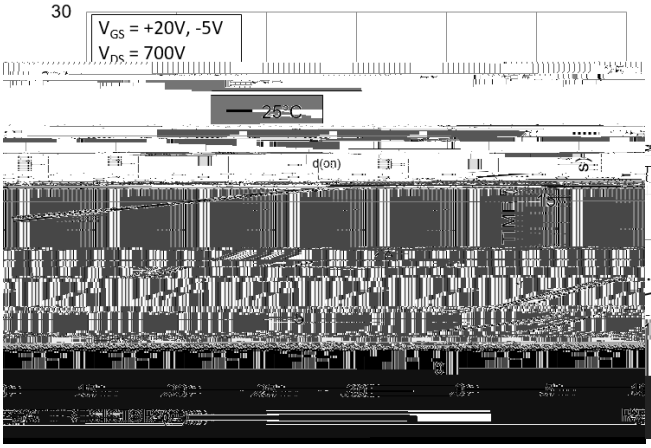


Figure 13. Typical Turn On Switching Time vs. R_G

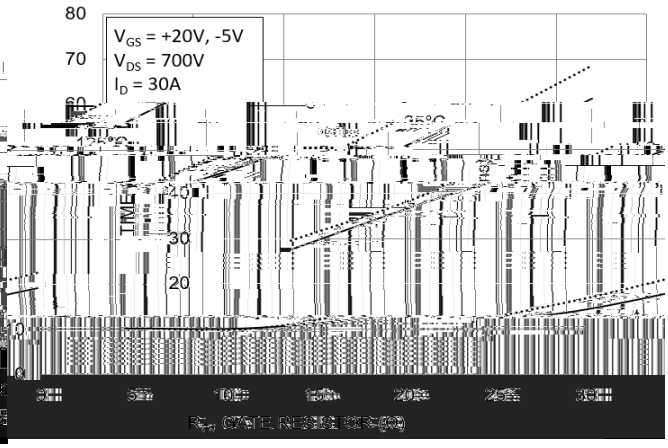


Figure 14. Typical Turn Off Switching Time vs. R_G

TYPICAL CHARACTERISTICS – BOOST DIODE

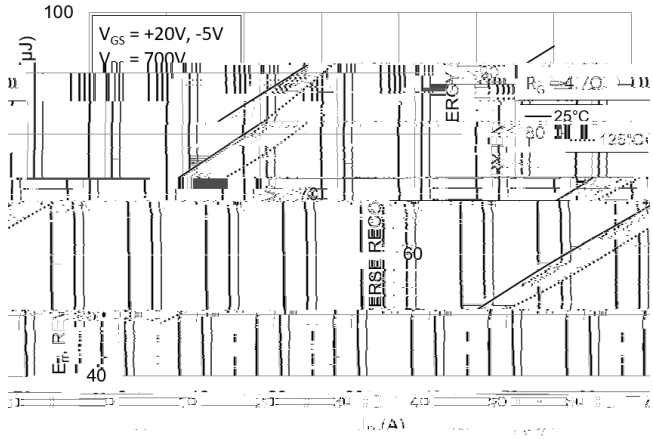


Figure 15. Typical Reverse Recovery Energy Loss vs. I_D

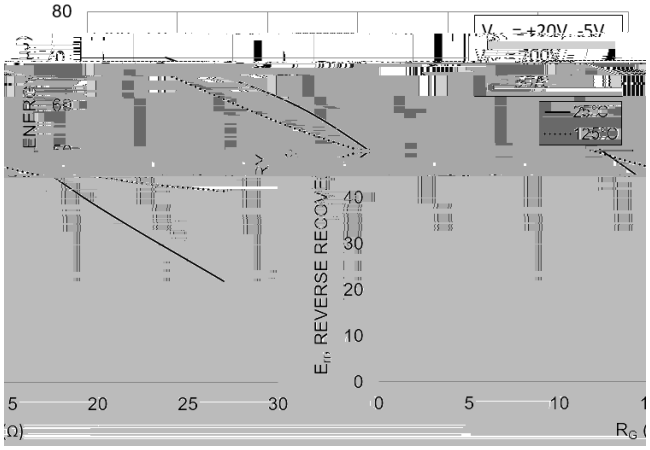


Figure 16. Typical Reverse Recovery Energy Loss vs. R_G

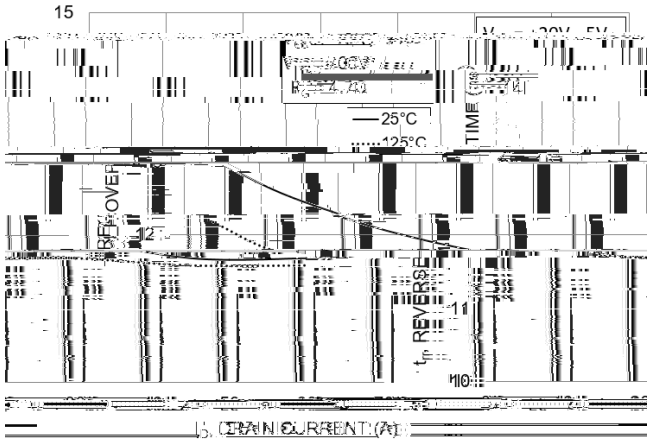


Figure 17. Typical Reverse Recovery Time vs. I_D

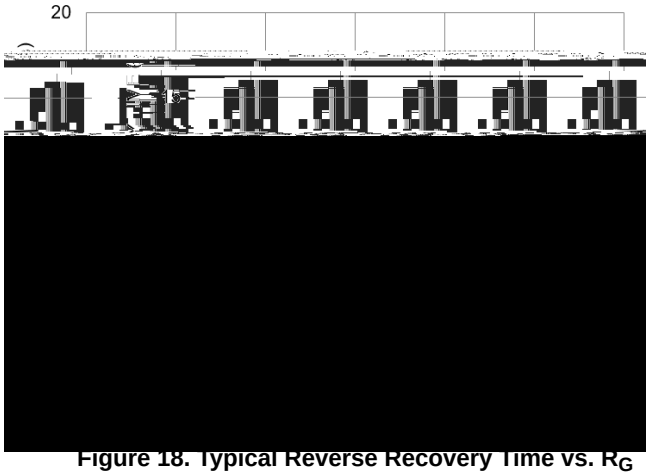


Figure 18. Typical Reverse Recovery Time vs. R_G

TYPICAL SWITCHING CHARACTERISTICS – BOOST DIODE

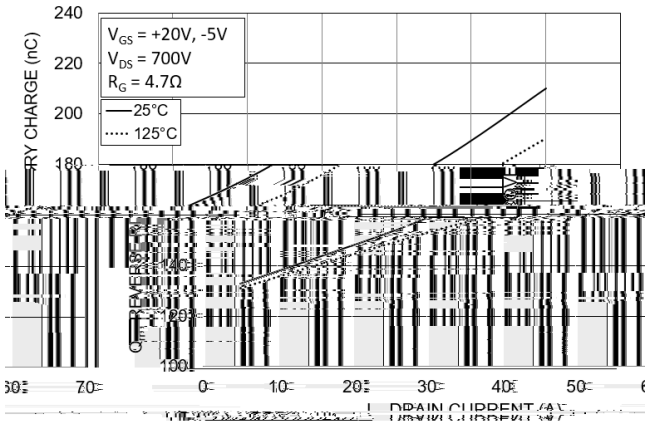


Figure 19. Typical Reverse Recovery Charge vs. I_D

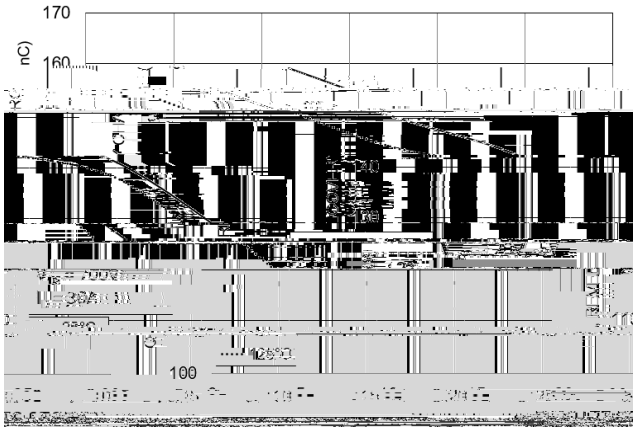


Figure 20. Typical Reverse Recovery Charge vs. R_G

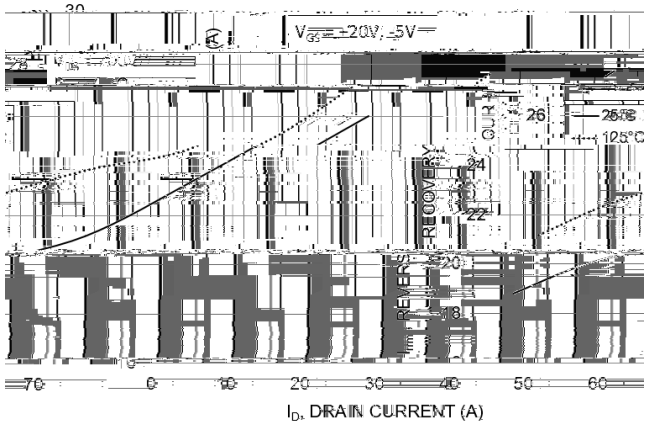


Figure 21. Typical Reverse Recovery Peak Current vs. I_D

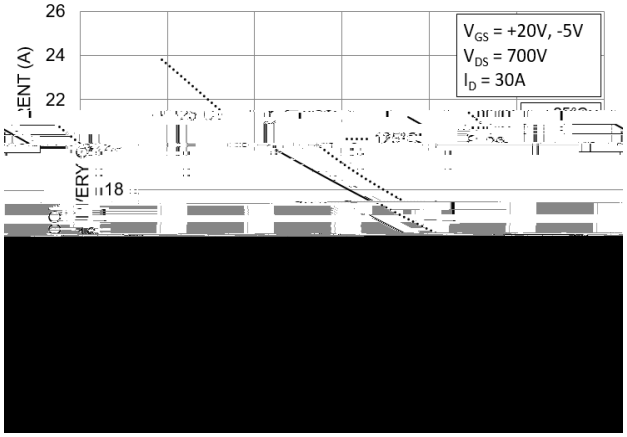


Figure 22. Typical Reverse Recovery Peak Current vs. R_G

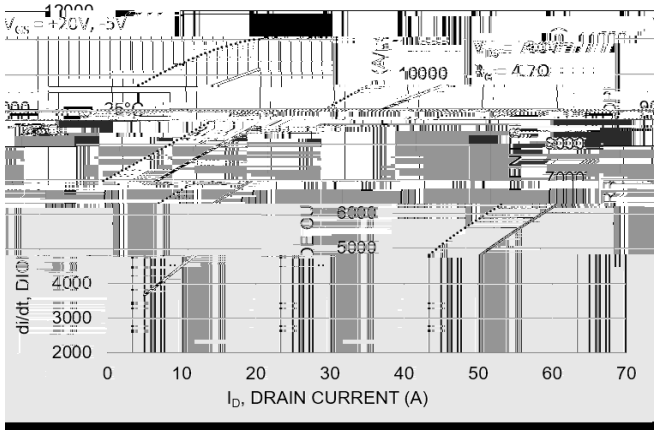


Figure 23. Typical di/dt vs. I_D

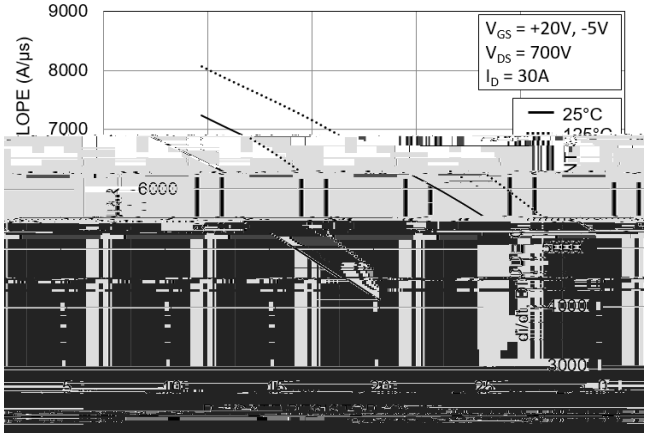


Figure 24. Typical di/dt vs. R_G

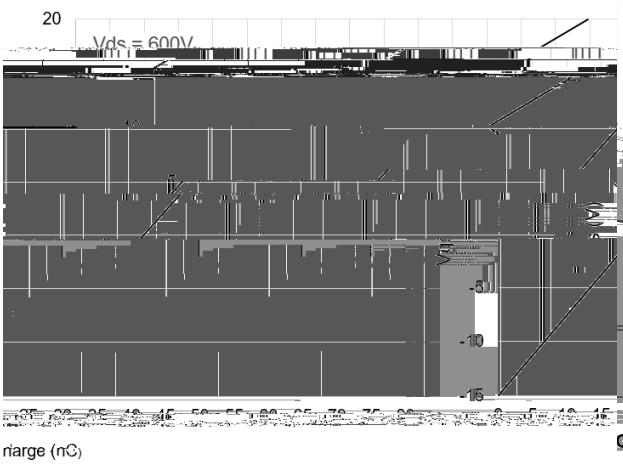
TRANSIENT THERMAL IMPEDANCE – MOSFET, BOOST DIODE AND BYPASS DIODE

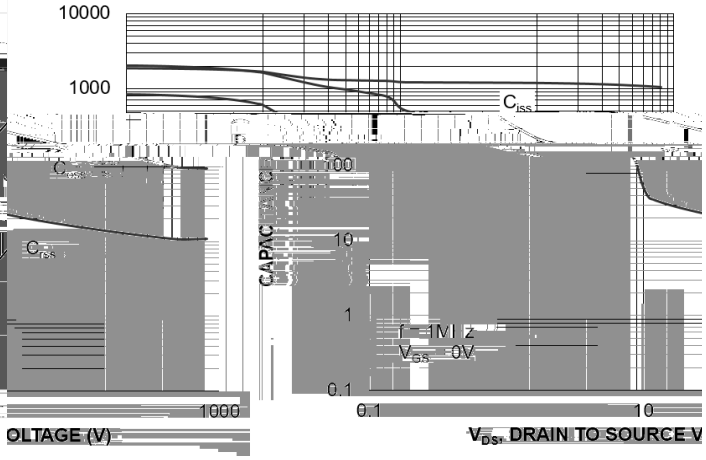
Figure 25. MOSFET Transient Thermal Impedance

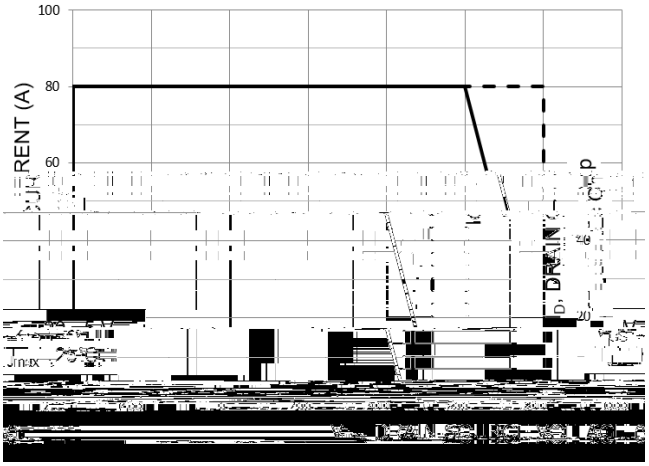
Figure 26. Boost Diode Transient Thermal Impedance

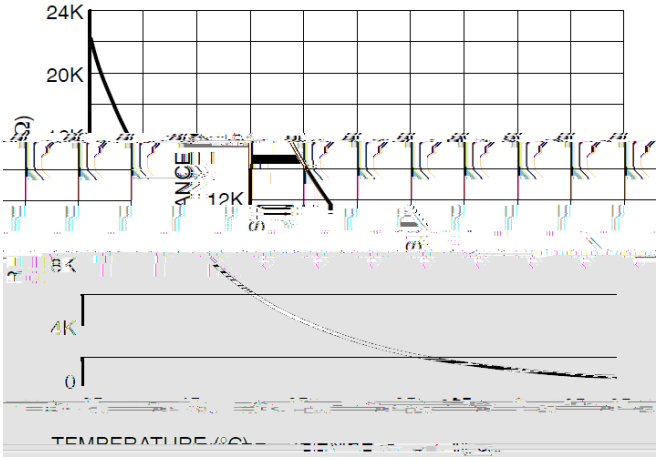
Figure 27. Bypass Diode Transient Thermal Impedance

GATE CHARGE, CAPACITANCE CHARGE, SOA AND THERMISTOR CHARACTERISTICS









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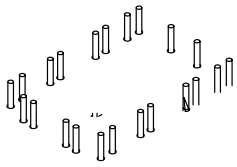

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