IRK.41, SERIES
High Voltage Diode/Diode

FEATURES

- *High voltage.*
- *Electrically isolated base plate.*
- *3000 V_{RMS} isolating voltage.*
- *Industrial standard package.*
- *Simplified mechanical designs, rapid assembly.*
- *High surge capability.*
- *Large creepage distances.*
- *Aluminum Nitride*

DESCRIPTION

These IRK series of Power Modules use power diodes in three basic configurations. The semiconductors are electrically isolated from the metal base, allowing common heatsinks and compact assemblies to be built. They can be interconnected to form single phase or three phase bridges.
These modules are intended for general purpose applications such as battery chargers, welders and plating equipment.

MAJOR RATINGS & CHARACTERISTICS

Parameters		IRK. 41	Units
$I_{F(AV)}$		40 (85)	A
$I_{F(RMS)}$		63	A
I_{FSM}	@ 50 Hz	850	A
I^2t	@ 50 Hz	3610	A^2s
$I^2\sqrt{t}$		36100	$A^2\sqrt{s}$
V_{RRM}	range	400 to 1600	V
T_J	range	-40 to 135	°C

(*) Contact factory for higher voltages (1600-2000V) and higher currents (60, 80, 100 A)

POWER MODULES

IRK.41, SERIES

ELECTRICAL SPECIFICATION

VOLTAGE RATINGS

Type Number	Voltage Code	V_{RRM}, max. repetitive peak reverse voltage V	V_{RSM}, max. non-repetitive peak reverse voltage V	I_{RRM} max. mA
	04	400	500	10
IRK.41	06	600	700	10
	08	800	900	10
	10	1000	1100	10
	12	1200	1300	10
	14	1400	1500	10
	16	1600	1700	10

FORWARD CONDUCTION

	Parameters	IRK.41	Units	Conditions	
$I_{F(AV)}$	Max. average forward current	40	A	180°C conduction, half sine wave	
	@ case temperature	40	°C		
$I_{F(RMS)}$	Max. RMS forward current	63	A		
I_{FSM}	Max. peak, one cycle forward non-repetitive surge current	850	A	t = 10ms	Sinusodial half wave, Initial $T_J = T_J$ max.
I^2t	Maximum I^2t for fusing	3610	A^2s	t = 10ms	
I^2t	Maximum I^2t for fusing	36100	A^2s	t = 0.1 to 10ms. No voltage reapplied.	
$V_{F(TO)}$	Threshold voltage	0.88	V	$T_J = T_J$ max.	
r_t	Forward slope resistance	5.90	mΩ	$T_J = T_J$ max.	
V_{FM}	Max. forward voltage drop	1.65	V	$I_{FM} = \pi \times I_{F(AV)}$, $T_J = 25^0C$, $t_p = 400\mu s$ squarewave AV. power = $V_{F(TO)} \times I_{F(AV)} + r_1 \times (I_{F(RMS)})^2$	

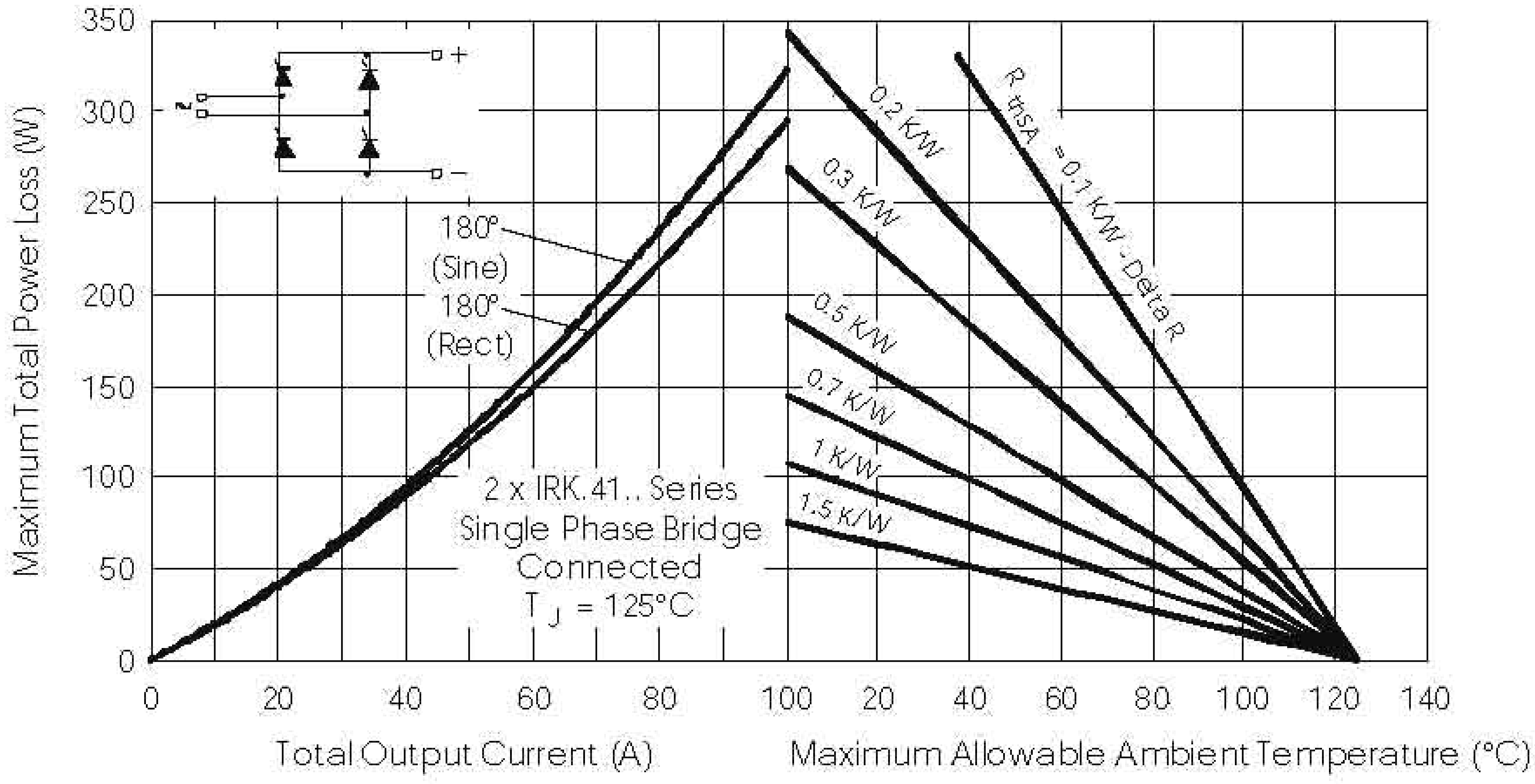
IRK. 41, SERIES

THERMAL AND MECHANICAL SPECIFICATIONS

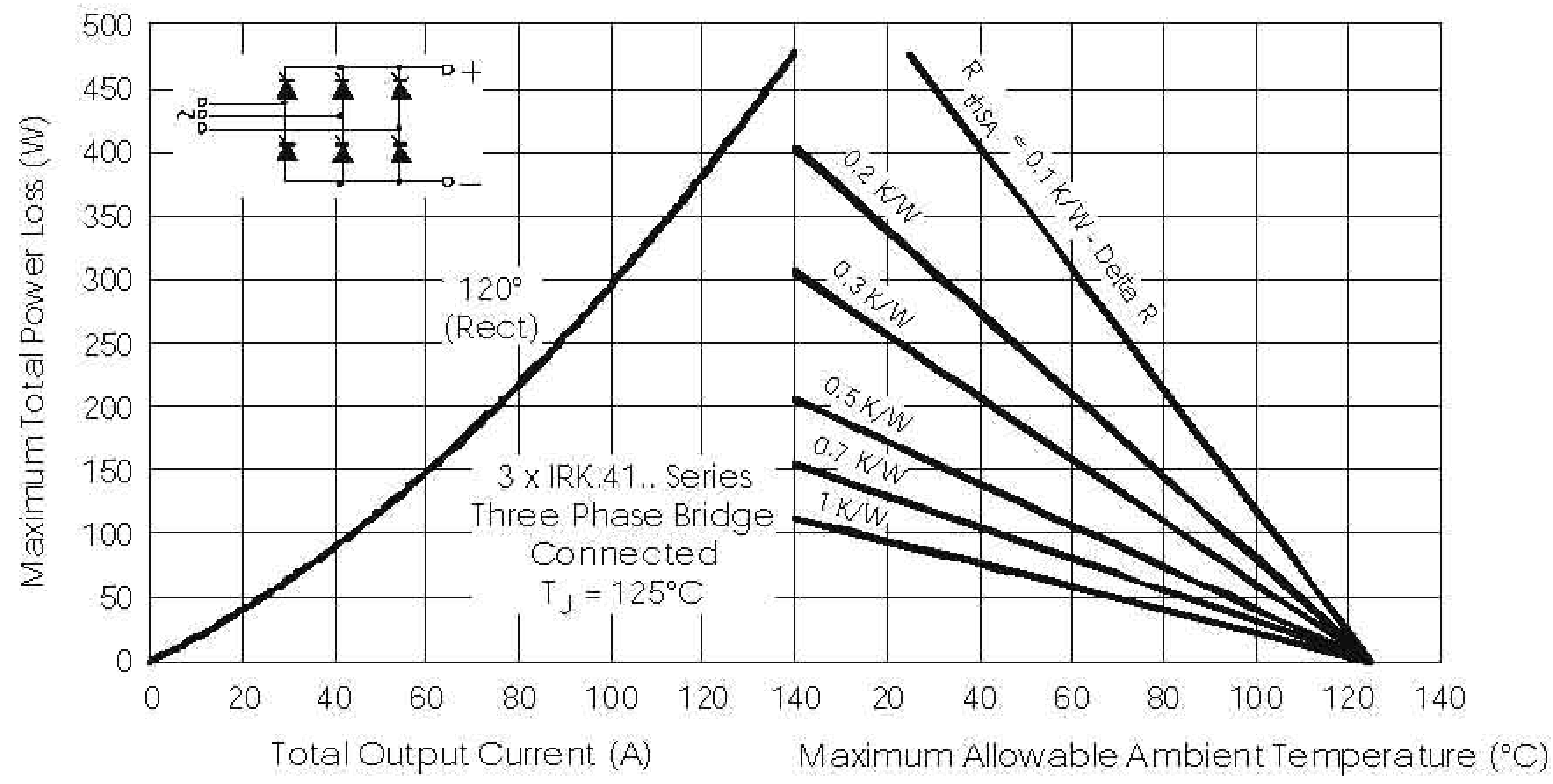
	Parameter		IRK.41	Units	Conditions	
T_J	Junction operating temperature		-40 to 135	^0C		
T_{stg}	Storage temperature range		-40 to 150	^0C		
R_{thJ-C}	Max. internal thermal resistance, junction to case		0.23	K/W	IRKD../IRKJ../IRKC..	Per module, DC operation
R_{thC-S}	Thermal resistance, case to heatsink		0.1	K/W	Mounting surface flat, smooth and greased	
T	Mounting torque ±10%	Module to heatsink	5	Nm	A mounting compound is recommended and the torque should be rechecked after a period of about 3 hours to allow for the spread of the compound.	
		Busbar to module	3	Nm		
Wt	Approximate weight		75	g		

BLOCKING

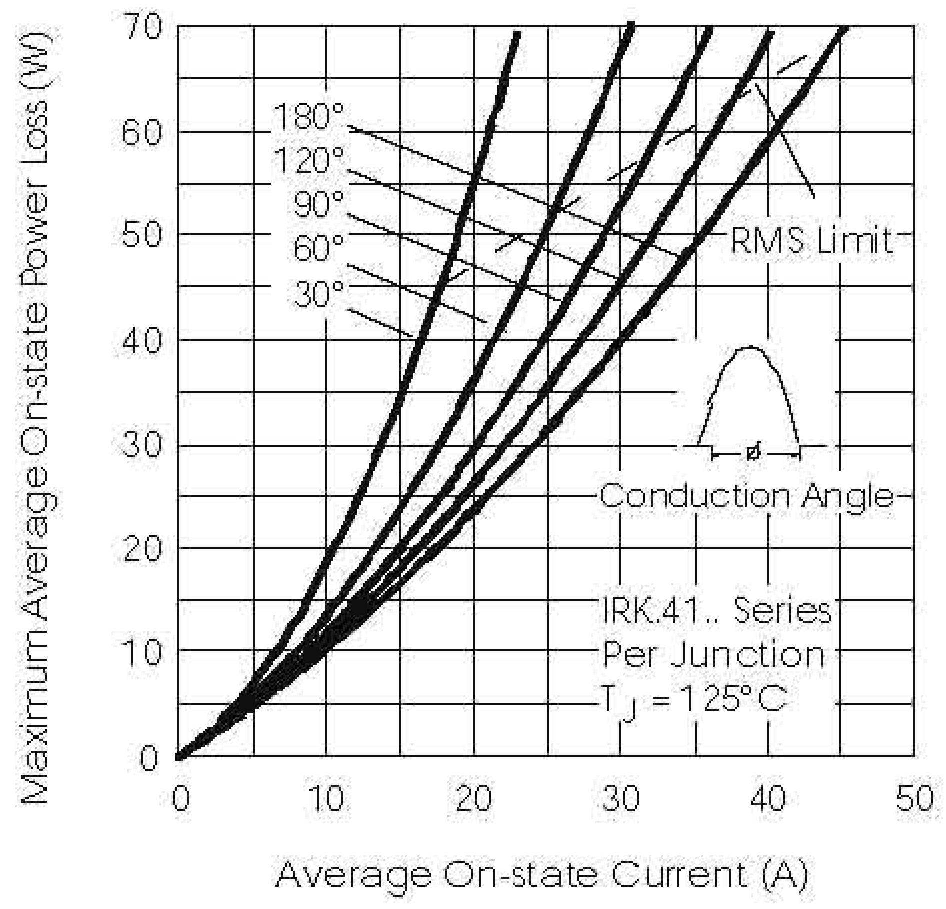
	Parameters	IRK.41	IRK.71	Units	Conditions
I_{RRM}	Max. peak reverse leakage current	10	10	mA	$T_J = 150^0C$
V_{INS}	RMS isolation voltage	3500	3500	V	50 Hz circuit to base, all terminals shorted, t = 1s



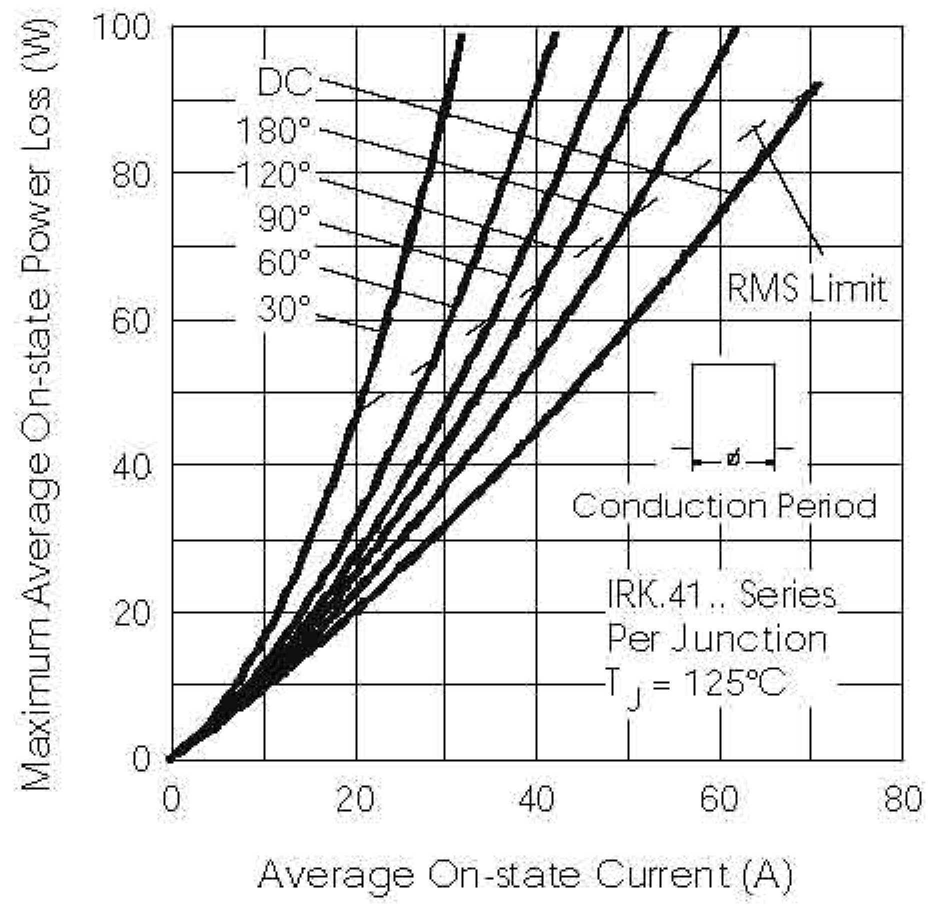
On-state Power Loss Characteristics



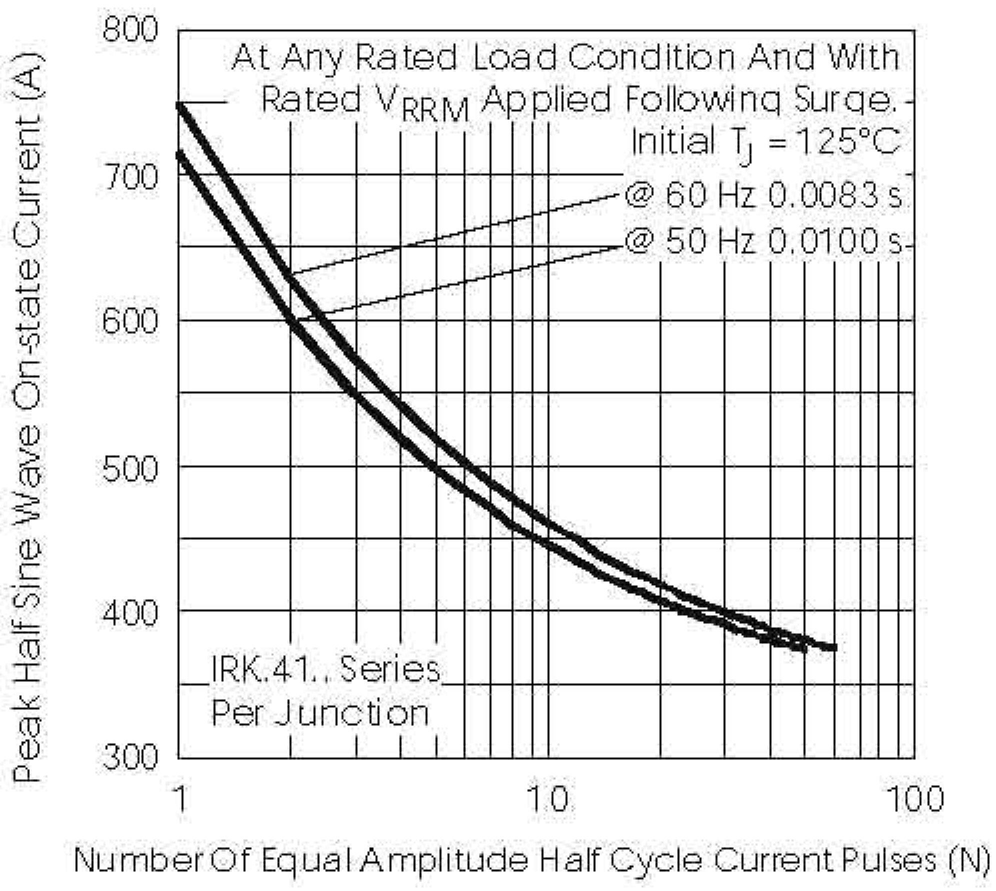
On-state Power Loss Characteristics



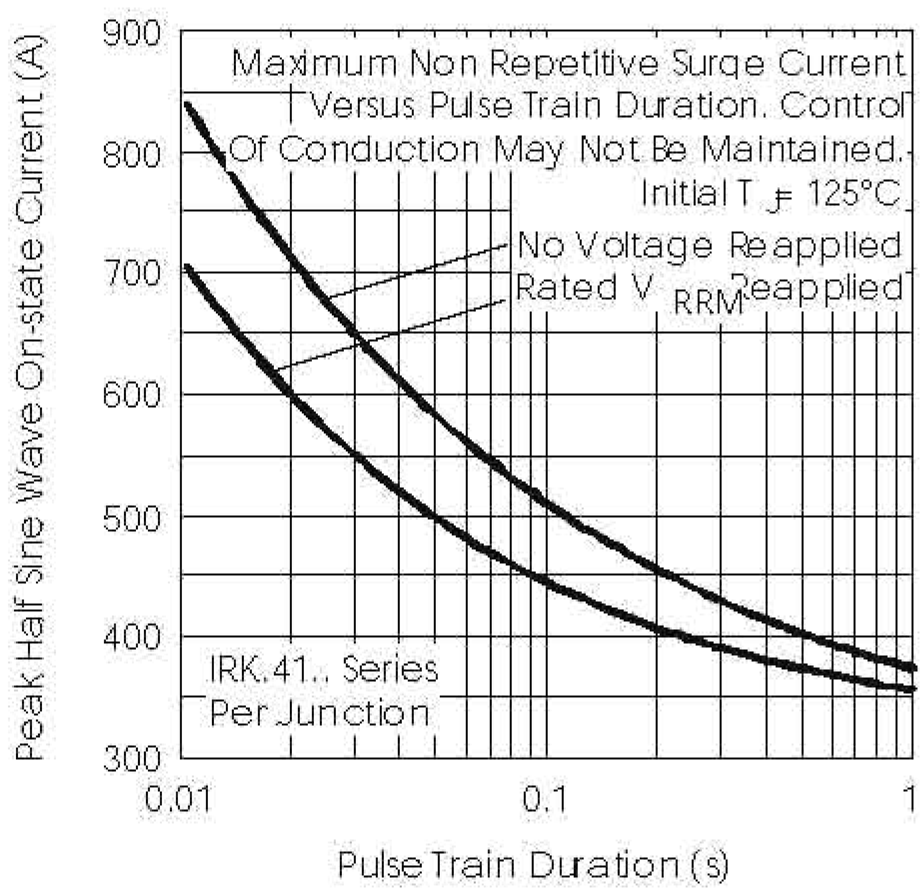
On-state Power Loss Characteristics



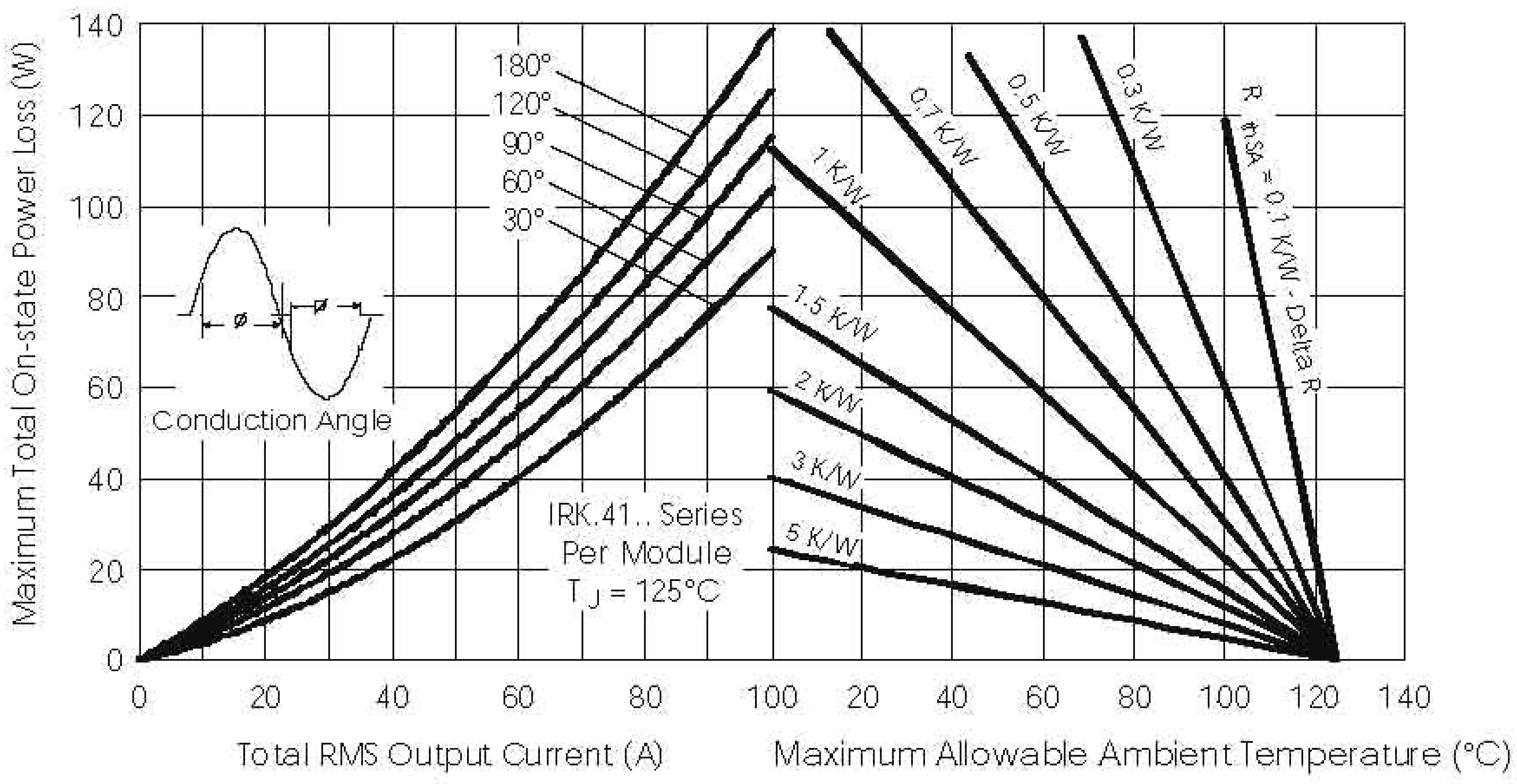
On-state Power Loss Characteristics



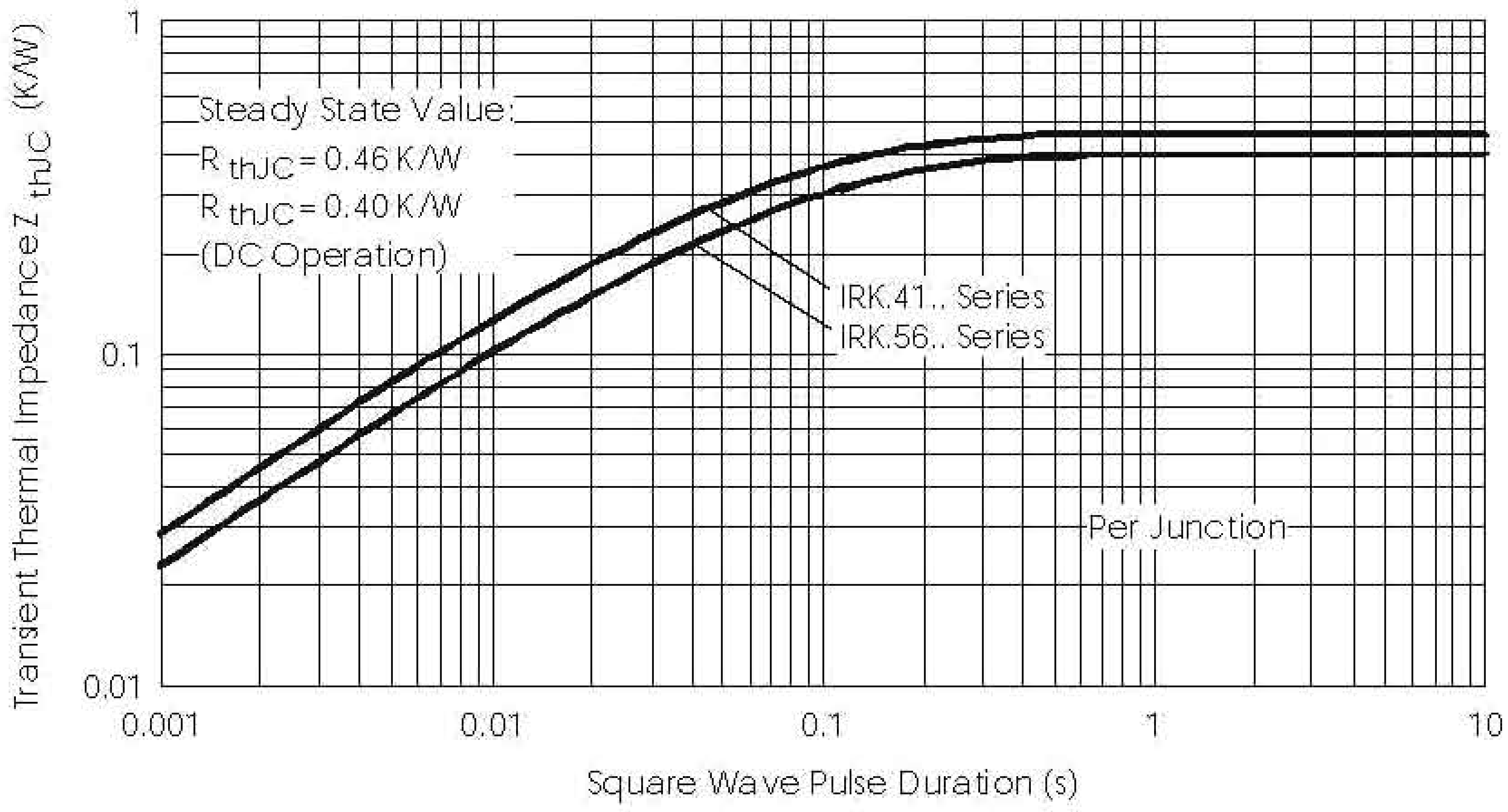
Maximum Non-Repetitive Surge Current



Maximum Non-Repetitive Surge Current



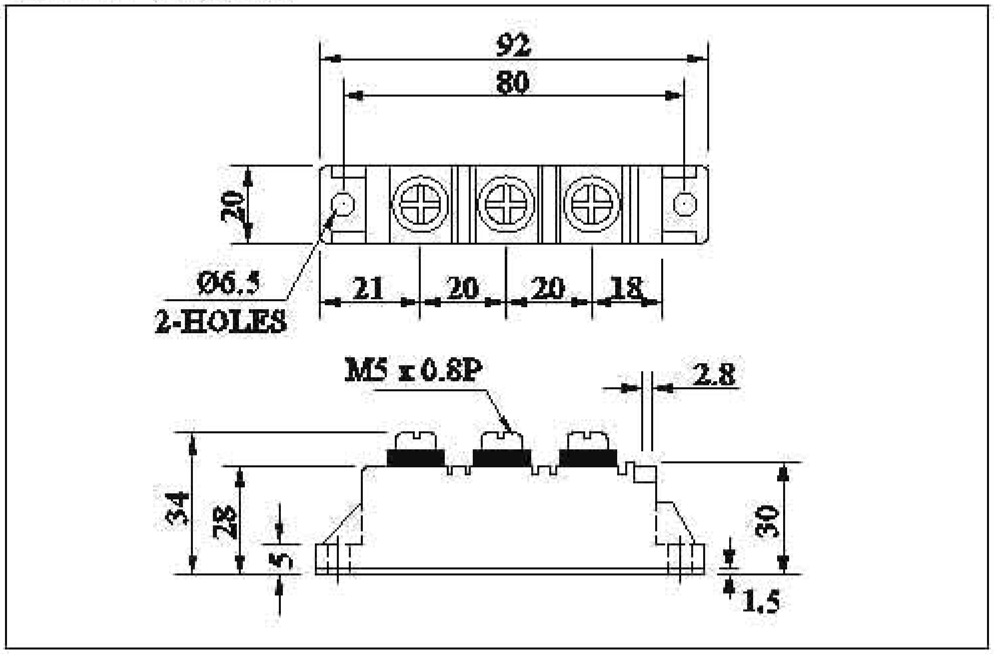
On-state Power Loss Characteristics



Thermal Impedance Z_{thJC} Characteristics

POWER MODULES

OUTLINE DIAGRAM



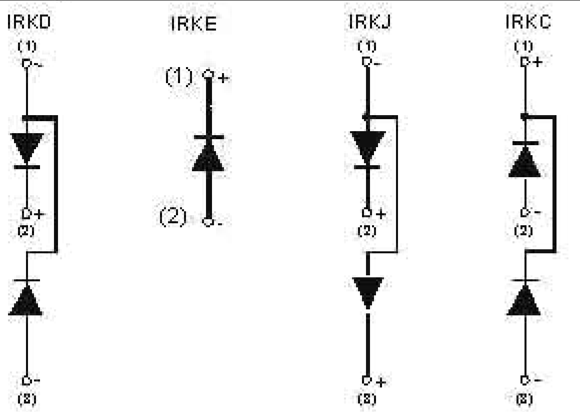
Ordering Information Table

Device Code

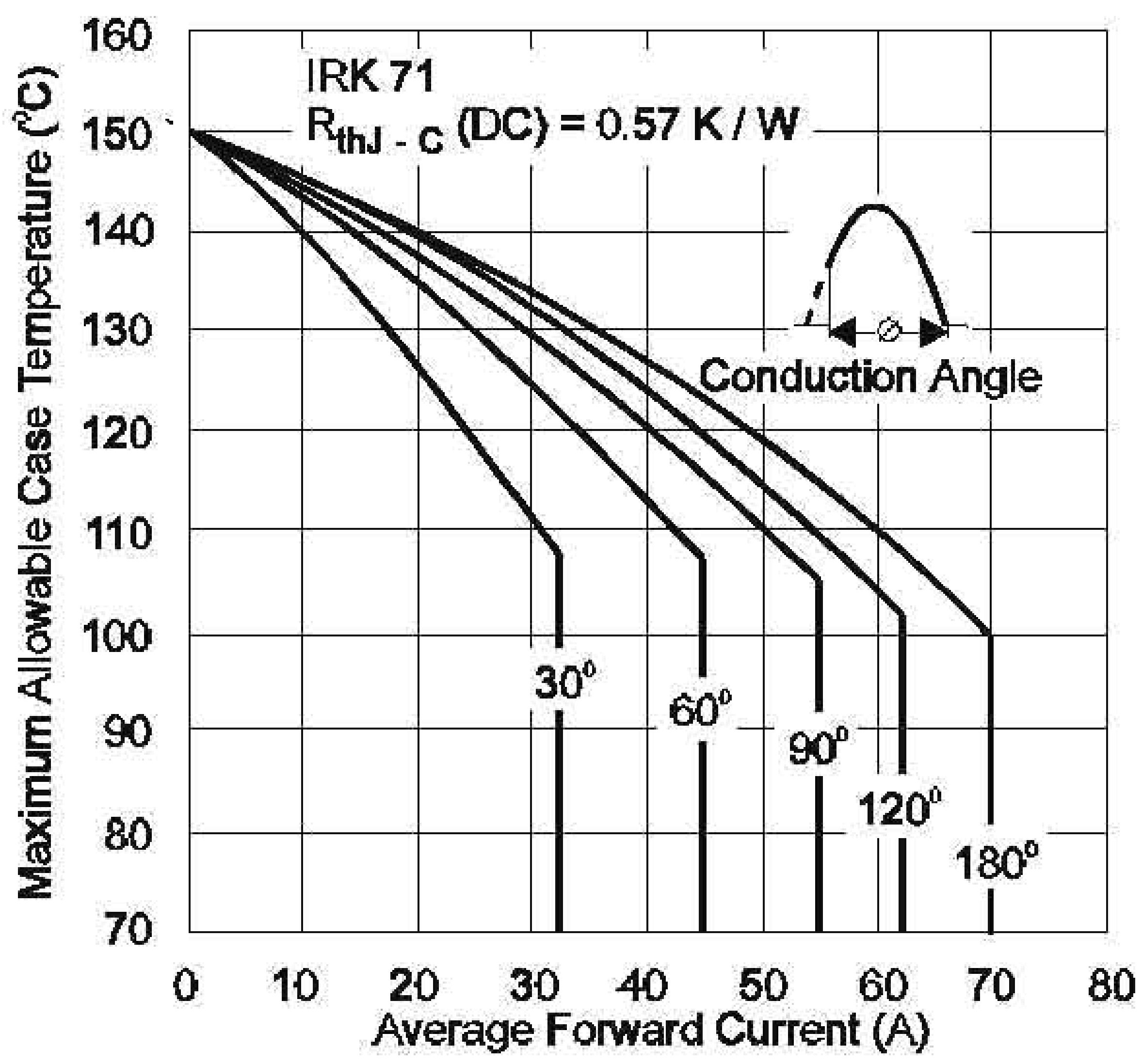
IRK	D	41	/	16
1	2	3		4

1 - Module type
2 - Circuit configuration (See Circuit Configuration Table)
3 - Current code
4 - Voltage code (See Voltage Ratings Table)

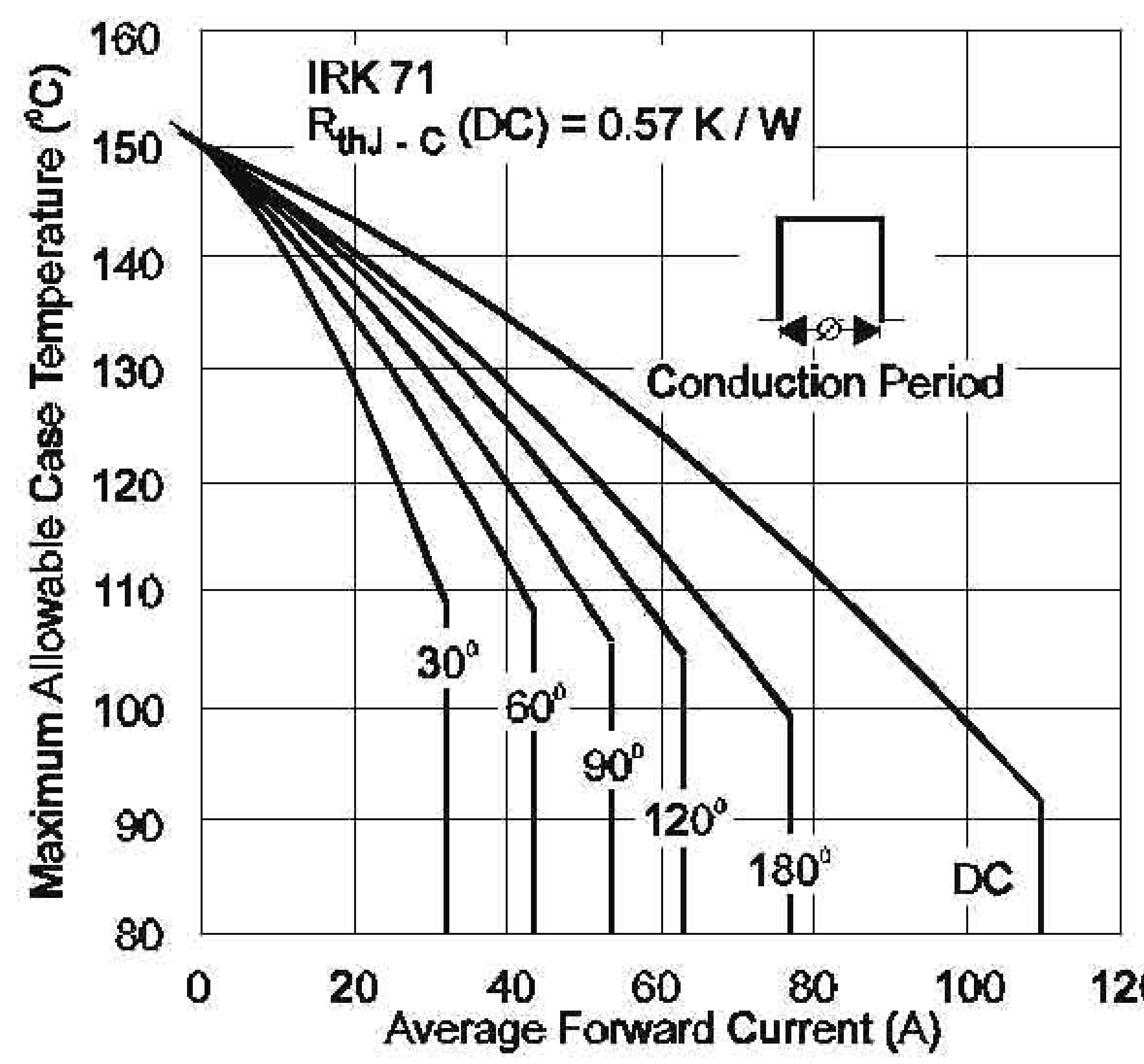
Circuit Configurations Table



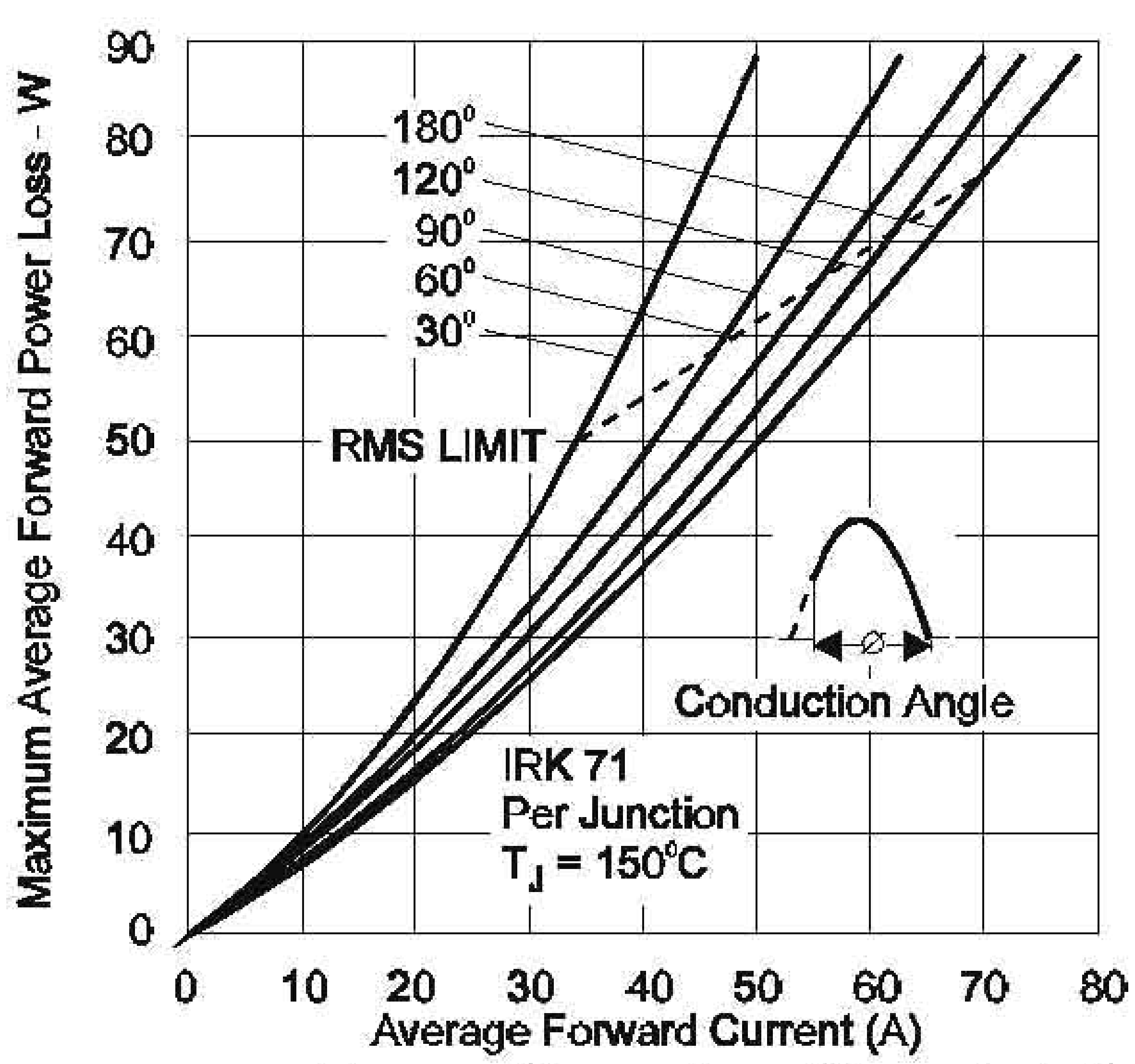
D = 2 diodes in series
E = Single diode
J = 2 diodes/common anode
C = 2 diodes/common cathode



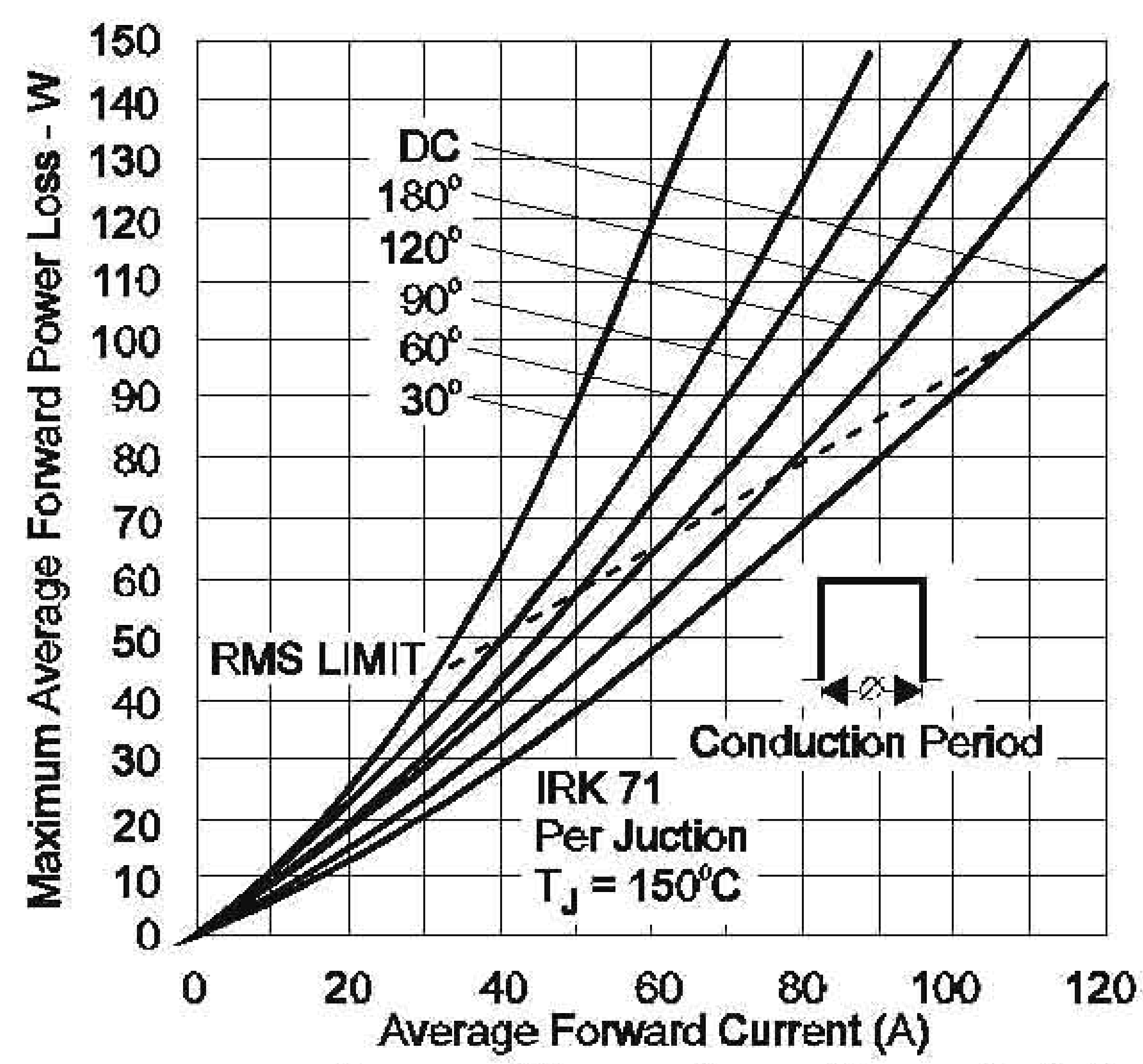
Current Ratings Characteristics



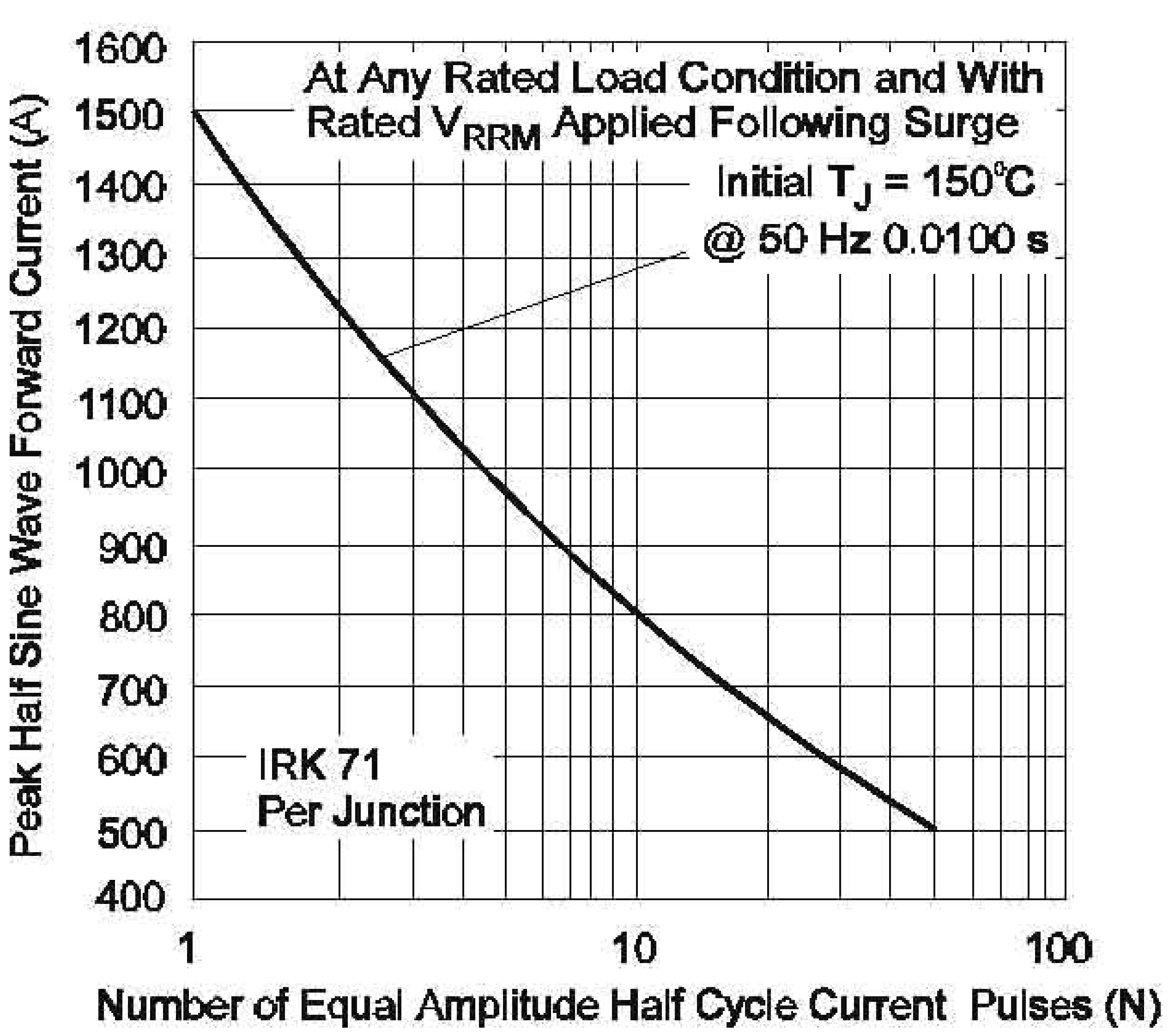
Current Ratings Characteristics



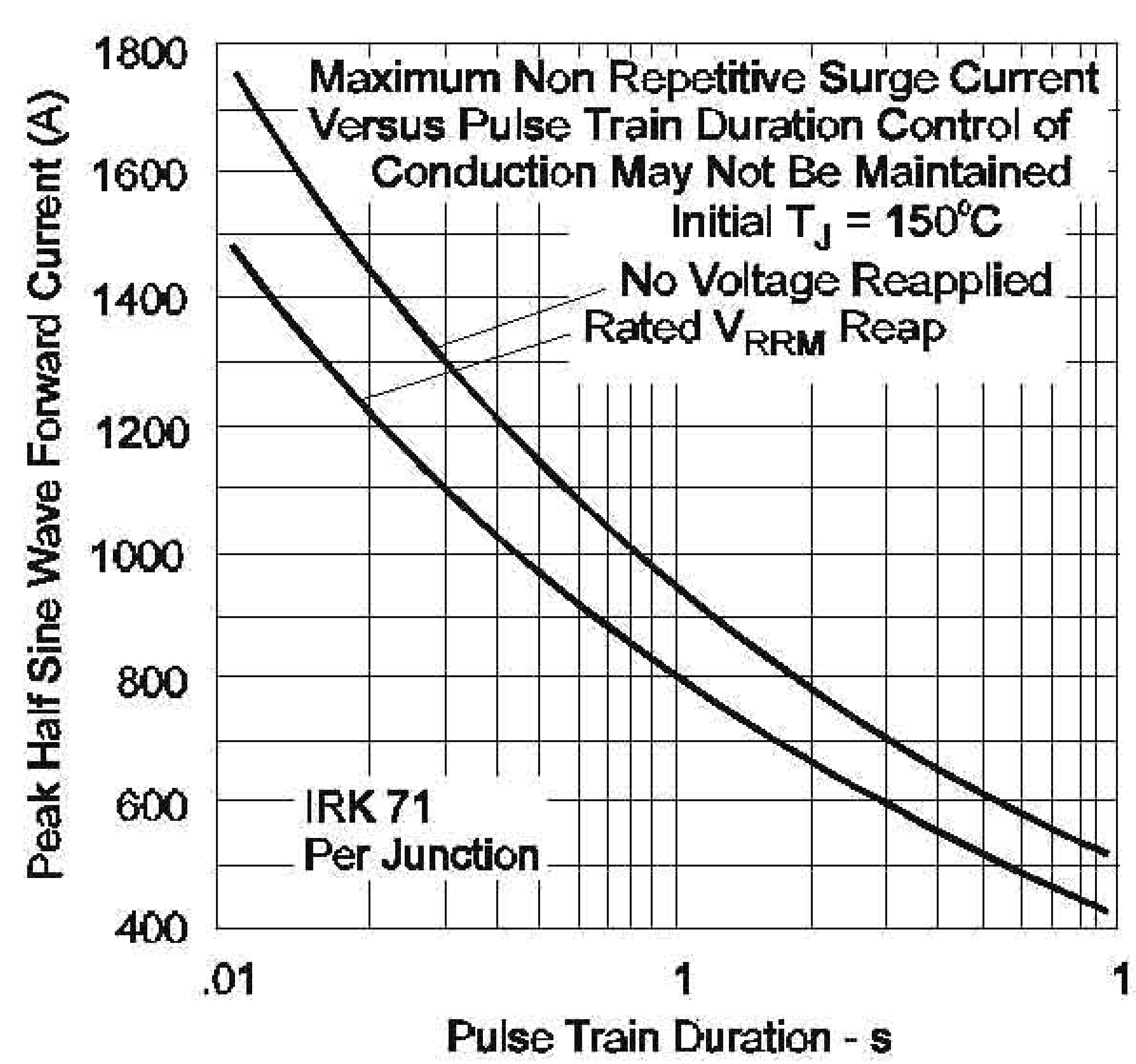
Forward Power Loss Characteristics



Forward Power Loss Characteristics

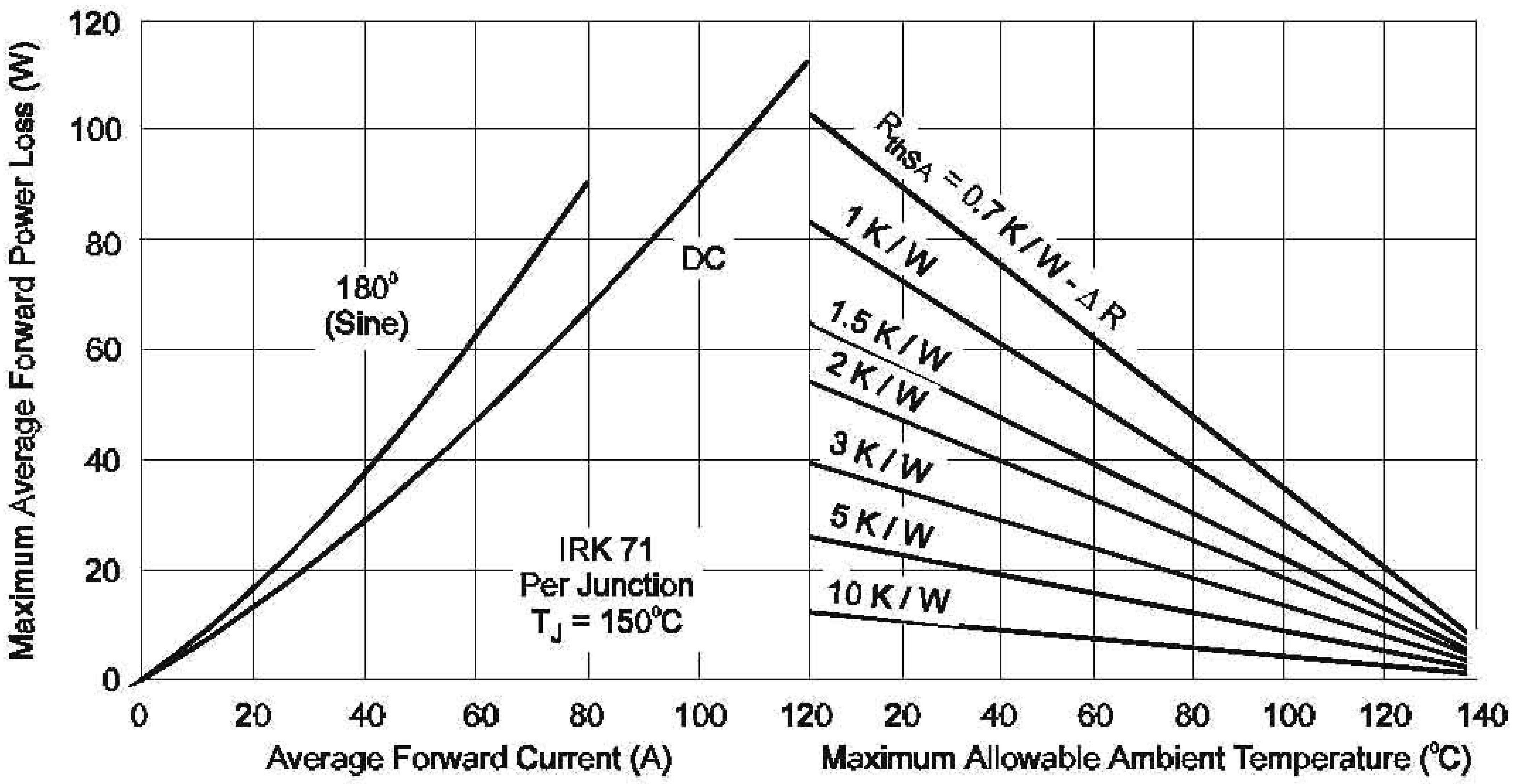


Maximum Non-Repetitive Surge Current

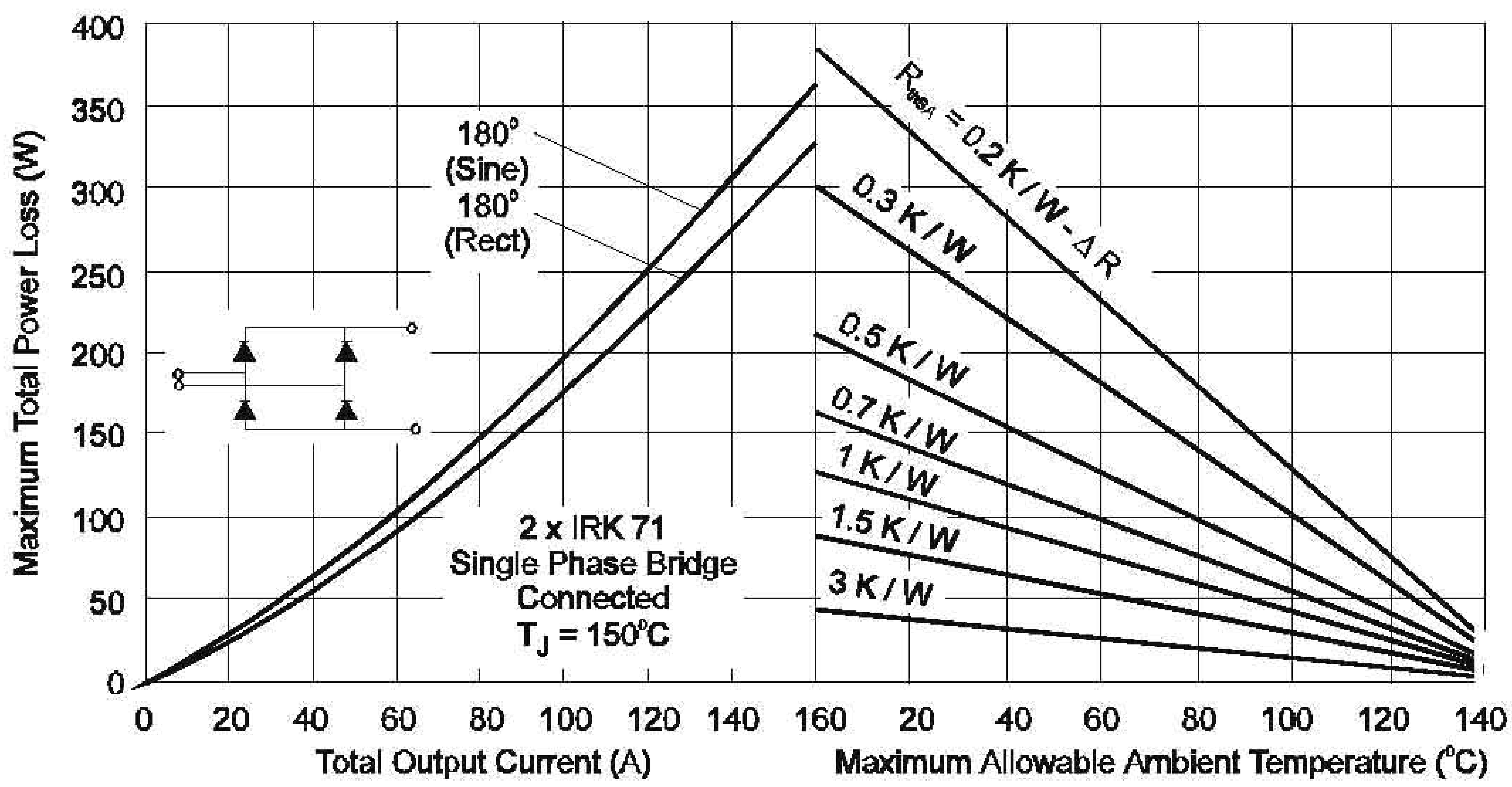


Maximum Non-Repetitive Surge Current

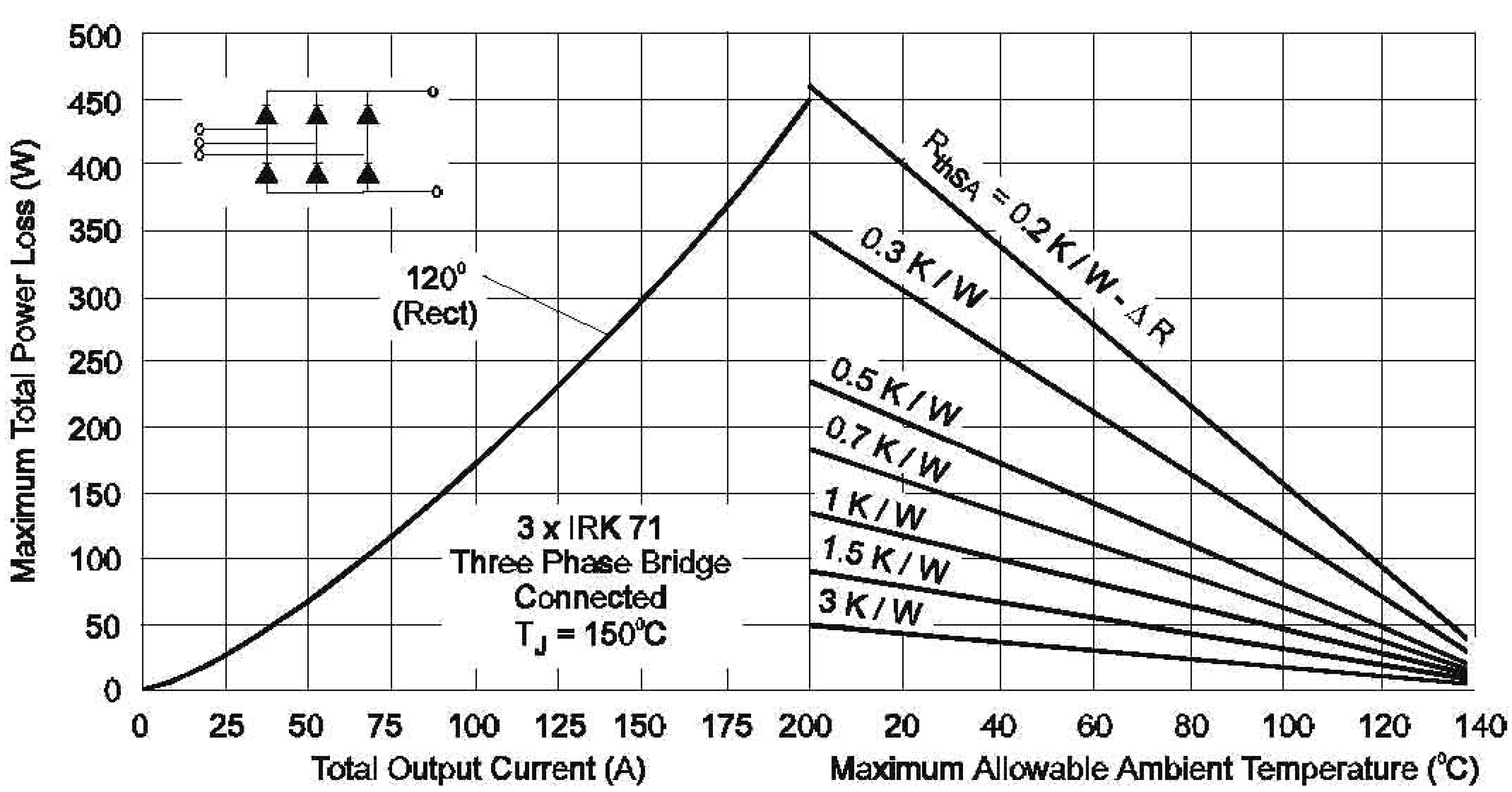
IRK. 41, 71 SERIES



Forward Power Loss Characteristics



Forward Power Loss Characteristics



Forward Power Loss Characteristics