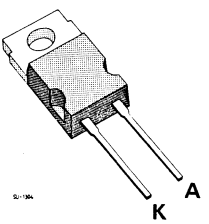
SGS®

SGS8R05
SGS8R10
SGS8R15
SGS8R20

HIGH SPEED SWITCHING APPLICATIONS SECONDARY RECTIFICATION

- VOLTAGE RANGE: 50V - 200V
- AVERAGE CURRENT: 8A
- VERY LOW REVERSE RECOVERY TIME: t_{rr} 35ns
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING

Typical applications include secondary rectification in high frequency switching power supplies and freewheel diodes in stepper motor control systems.



DIOWATT1

ABSOLUTE MAXIMUM RATINGS

		SGS				
		8R05	8R10	8R15	8R20	
V_{RRM}	Peak repetitive reverse voltage	50	100	150	200	V
V_{RWM}	Working peak reverse voltage	50	100	150	200	V
V_R	Continuous reverse voltage	50	100	150	200	V
I_{FRM}	Repetitive peak forward current (t = 10μs)	100				A
$I_{F(AV)}$	Average forward current T_{case} = 70°C (switching operation, δ = 0.5)	8				A
I_{FSM}	Surge non repetitive forward current (t = 10ms)	80				A
P_{tot}	Total dissipation at T_{case} = 70°C	50				W
T_{stg}	Storage temperature	−65 to 150				°C
T_j	Max. operating junction temperature	150				°C

SGS8R05
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THERMAL DATA

$R_{thj\text{-}case}$	Thermal resistance junction-case	max 1.6 °C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C unless otherwise specified)

Parameters		Test Contitions	Min.	Typ.	Max.	Unit
I_R	Reverse Current	$V = V_R$ T_j = 25°C $V = V_R$ T_j = 100°C			10 0.3	μA mA
V_F(*)	Forward voltage	I_F = 5A T_{case} = 100°C I_F = 20A T_{case} = 25°C I_F = 8A T_{case} = 25°C			0.85 1.3 1	V V V
t_{rr}	Reverse recovery time	I_F = 1A di/dt = 50A/μs V_R = 30V I_F = 2A di/dt = 20A/μs V_R = 30V I_F = 2A di/dt = 20A/μs T_j = 100°C			35 50 70	ns ns ns
Q_{rr}	Recovered charge	I_F = 2A di/dt = 20A/μs V_R = 30V			15	nC
V_{FP}	Forward recovery overvoltage	I_F = 1A di/dt = 10A/μs		1		V

* Pulsed: pulse duration ≤300μs, duty cycle ≤2%

Fig. 1 Average forward current vs. air temperature and cooling system

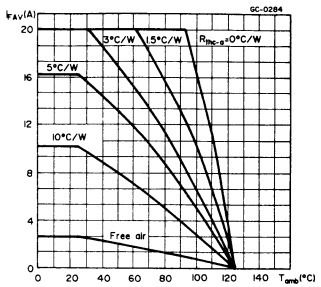


Fig. 2 Voltage drop vs. forward current

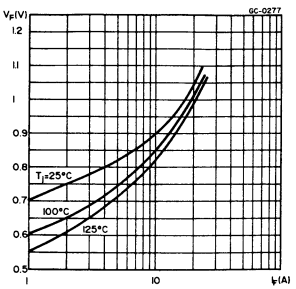


Fig. 3 Reverse leakage current vs. junction temperature.

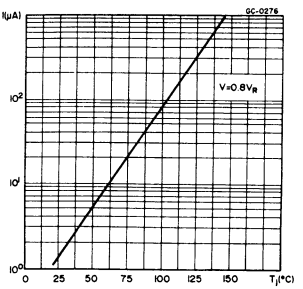


Fig. 4 Recovery time and peak reverse current vs. I_F

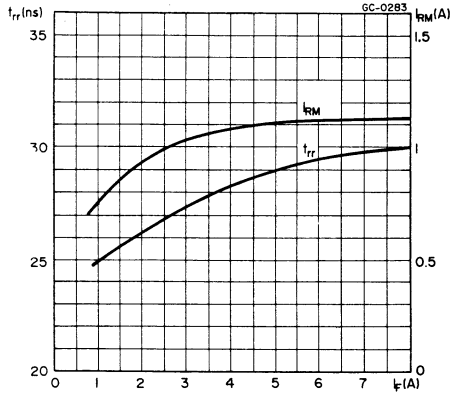


Fig. 5 Recovered charge vs. di_F/dt

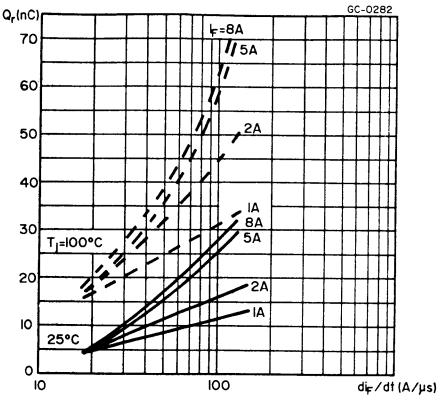


Fig. 6 Recovery time vs. di_F/dt

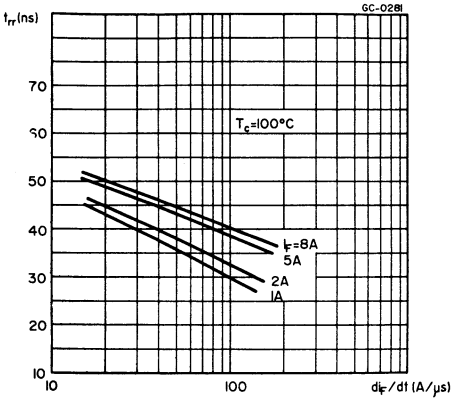
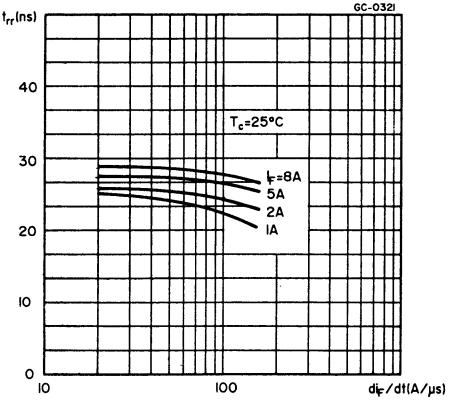


Fig. 7 Recovery time vs. di_F/dt

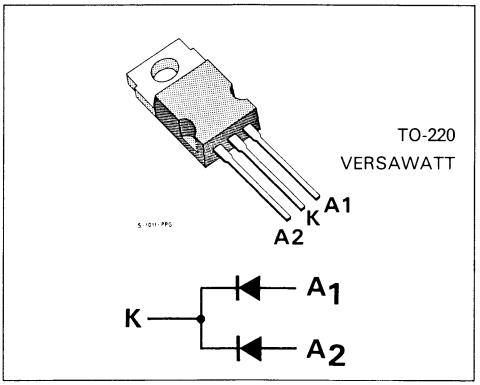


SGS16DR05
SGS16DR10
SGS16DR15
SGS16DR20

HIGH SPEED SWITCHING APPLICATIONS

- VOLTAGE RANGE: 50V→200V
- AVERAGE CURRENT: 16A
- VERY LOW REVERSE RECOVERY TIME: t_{rr} 35ns
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING

Typical applications include secondary rectification in high frequency switching power supplies.



ABSOLUTE MAXIMUM RATINGS

		SGS				
		16DR05	16DR10	16DR15	16DR20	
V_{RRM}	Peak repetitive reverse voltage	50	100	150	200	V
V_{RWM}	Working peak reverse voltage	50	100	150	200	V
V_R	Continuous reverse voltage	50	100	150	200	V
I_{FRM}	Repetitive peak forward current (t = 10μs)	120				A
$I_{F(AV)}$	Average forward current T_{case} = 70°C (switching operation, δ = 0.5)	16				A
I_{FSM}	Surge non repetitive forward current (t = 10ms)	100				A
P_{tot}	Total dissipation at T_{case} = 70°C	70				W
T_{stg}	Storage temperature	−65 to 150				°C
T_j	Max. operating junction temperature	150				°C

THERMAL DATA

$R_{thj\text{-}case}$	Thermal resistance junction-case	max 1.15 °C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C unless otherwise specified) (per

Parameters		Test Contitions	Min.	Typ.	Max.	Unit
I_R	Reverse Current	$V = V_R$ T_j = 25°C $V = V_R$ T_j = 100°C			10 0.6	μA mA
V_F(*)	Forward voltage	I_F = 5A T_{case} = 100°C I_F = 20A T_{case} = 25°C I_F = 8A T_{case} = 25°C			0.85 1.3 1	V V V
t_{rr}	Reverse recovery time	I_F = 1A di/dt = 50A/μs V_R = 30V I_F = 2A di/dt = 20A/μs V_R = 30V I_F = 5A di/dt = 20A/μs T_j = 100°C			35 50 70	ns ns ns
Q_{rr}	Recovered charge	I_F = 2A di/dt = 20A/μs V_R = 30V			15	nC
V_{FP}	Forward recovery overvoltage	I_F = 1A di/dt = 10A/μs		1		V

* Pulsed: pulse duration ≤300μs, duty cycle ≤2%

Fig. 1 Average forward current vs. air temperature and cooling system

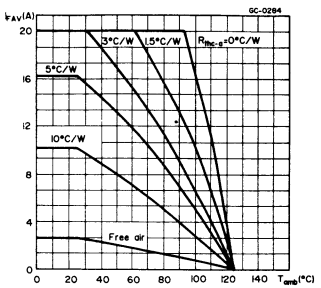


Fig. 2 Voltage drop vs. forward current

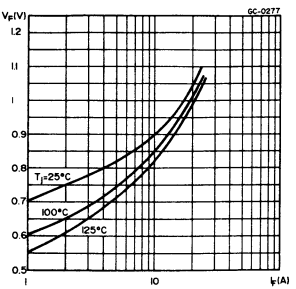


Fig. 3 Reverse leakage current vs. junction temperature.

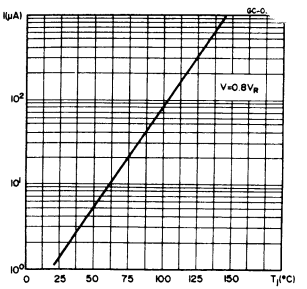


Fig. 4 Recovery time and peak reverse current vs. I_F

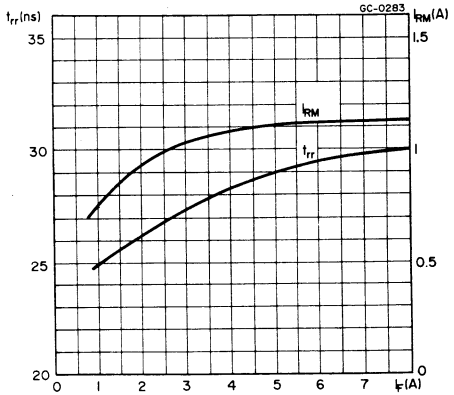


Fig. 5 Recovered time vs. di_F/dt

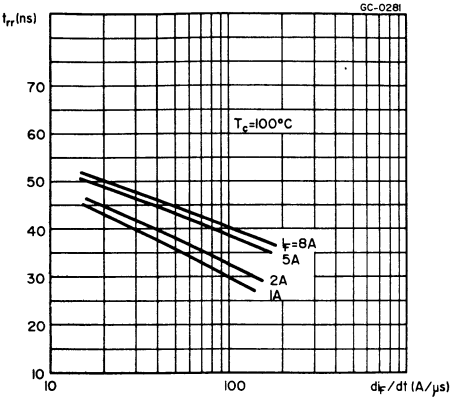


Fig. 6 Recovery charge vs. di_F/dt

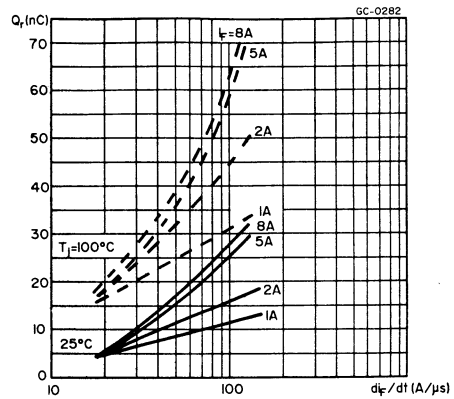
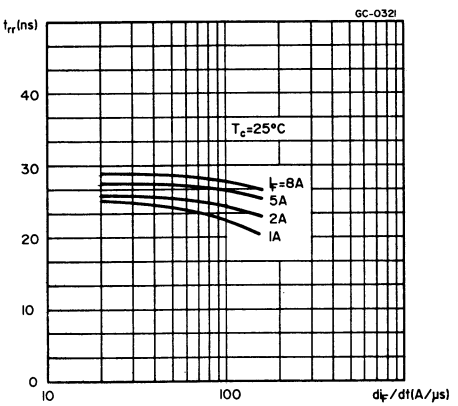


Fig. 7 Recovery time vs. di_F/dt

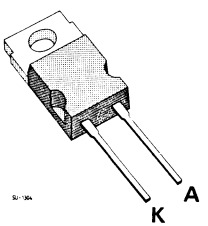


SGS20R05
SGS20R10
SGS20R15
SGS20R20

ADVANCE DATA

HIGH SPEED SWITCHING APPLICATIONS SECONDARY RECTIFICATION

- VOLTAGE RANGE: 50V→200V
- AVERAGE CURRENT: 20A
- VERY LOW REVERSE RECOVERY TIME: t_{rr} 35ns
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING



DO-220
DIOWATT1

Typical applications include secondary rectification in high frequency switching power supplies and freewheel diodes in stepper motor control systems.

ABSOLUTE MAXIMUM RATINGS

		SGS				
		20R05	20R10	20R15	20R20	
V_{RRM}	Peak repetitive reverse voltage	50	100	150	200	V
V_{RWM}	Working peak reverse voltage	50	100	150	200	V
V_R	Continuous reverse voltage	50	100	150	200	V
I_{FRM}	Repetitive peak forward current (t = 10μs)	250				A
$I_{F(AV)}$	Average forward current T_{case} = 70°C (switching operation, δ = 0.5)	20				A
I_{FSM}	Surge non repetitive forward current (t = 10ms)	200				A
P_{tot}	Total dissipation at T_{case} = 70°C	60				W
T_{stg}	Storage temperature	−65 to 150				°C
T_j	Max. operating junction temperature	150				°C

THERMAL DATA

$R_{thj\text{-}case}$	Thermal resistance junction-case	max 1.4 °C/W

ELECTRICAL CHARACTERISTICS ($T_{case} = 25°C$ unless otherwise specified)

Parameters		Test Contitions	Min.	Typ.	Max.	Unit
I_R	Reverse Current	$V = V_R$ $T_j = 25°C$ $V = V_R$ $T_j = 100°C$			40 1.5	μA mA
V_F(*)	Forward voltage	$I_F = 20A$ $T_{case} = 100°C$ $I_F = 20A$ $T_{case} = 25°C$			0.9 1	V V
t_{rr}	Reverse recovery time	$I_F = 1A$ $di/dt = -50A/\mu s$ $V_R = 30V$ $I_F = 1A$ $di/dt = -20A/\mu s$ $V_R = 30V$			35 50	ns ns
Q_{rr}	Recovered charge	$I_F = 2A$ $di/dt = -20A/\mu s$ $V_R = 30V$			8	nC
V_{FP}	Forward recovery overvoltage	$I_F = 1A$ $di/dt = 10A/\mu s$		1		V

* Pulsed: pulse duration $\leq 300\mu s$, duty cycle $\leq 2\%$

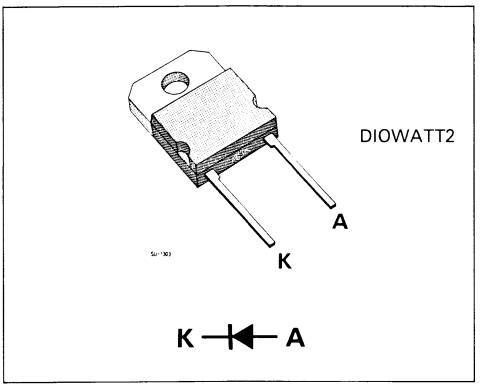
SGS35R120

ADVANCE DATA

HIGH SPEED SWITCHING APPLICATIONS

- VOLTAGE RANGE: 1200V
- AVERAGE CURRENT: 35A
- VERY LOW REVERSE RECOVERY TIME: t_{rr} 150ns
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING

Typical applications include freewheel diodes in motor control systems.



ABSOLUTE MAXIMUM RATINGS

V_{RRM}	Peak repetitive reverse voltage	1200	V
V_{RWM}	Working peak reverse voltage	1200	V
V_R	Continuous reverse voltage	1200	V
I_{FRM}	Repetitive peak forward current (t = 10μs)	500	A
$I_{F(AV)}$	Average forward current T_{case} = 70°C (switching operation, δ = 0.5)	35	A
I_{FSM}	Surge non repetitive forward current (t = 10ms)	350	A
P_{tot}	Total dissipation at T_{case} = 70°C	90	W
T_{stg}	Storage temperature	– 65 to 150	°C
T_j	Max. operating junction temperature	150	°C

THERMAL DATA

$R_{thj\text{-}case}$	Thermal resistance junction-case	max 0.9 °C/W

ELECTRICAL CHARACTERISTICS ($T_{case} = 25°C$ unless otherwise specified)

Parameters		Test Contitions	Min.	Typ.	Max.	Unit
I_R	Reverse Current	$V = V_R$ $T_j = 25°C$ $V = V_R$ $T_j = 125°C$			100 4	μA mA
V_F(*)	Forward voltage	$I_F = 35A$ $T_{case} = 25°C$ $I_F = 35A$ $T_{case} = 125°C$		1.5 1.5	1.7 1.7	V V
t_{rr}	Reverse recovery time	$I_F = 1A$ $di/dt = 25A/\mu s$ $V_R = 30V$ $I_F = 35A$ $di/dt = 100A/\mu s$ $V_R = 30V$			150 400	ns ns
Q_{rr}	Recovered charge	$I_F = 35A$ $di/dt = 100A/\mu s$ $V_R = 30V$		3		μC
V_{FP}	Forward recovery overvoltage	$I_F = 35A$ $di/dt = 100A/\mu s$		12		V

* Pulsed: pulse duration $\leq 300\mu s$, duty cycle $\leq 2\%$

Fig. 1 Forward overvoltage vs. current slope

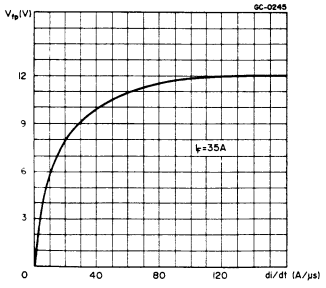


Fig. 2 Reverse leakage current vs. junction temperature

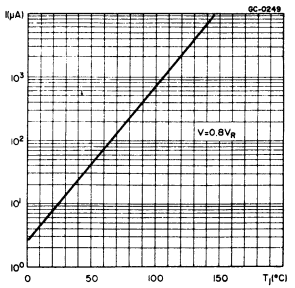
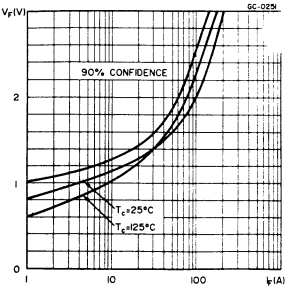


Fig. 3 Voltage drop vs. forward current



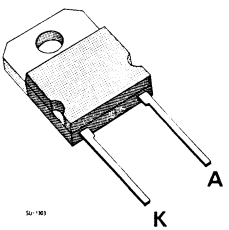
SGS45R80

ADVANCE DATA

HIGH SPEED SWITCHING APPLICATIONS

- VOLTAGE RANGE: 800V
- AVERAGE CURRENT: 45A
- VERY LOW REVERSE RECOVERY ,ME: t_{rr} 125ns
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING

Typical applications include freewheel diodes in motor control systems.



DIOWATT2

`SOLUTE MAXIMUM RATINGS

V_{RRM}	Peak repetitive reverse voltage	800	V
V_{RWM}	Working peak reverse voltage	800	V
V_R	Continuous reverse voltage	800	V
I_{FRM}	Repetitive peak forward current ($t = 10\mu s$)	600	A
$I_{F(AV)}$	Average forward current $T_{case} = 70°C$ (switching operation, $\delta = 0.5$)	45	A
I_{FSM}	Surge non repetitive forward current ($t = 10ms$)	450	A
P_{tot}	Total dissipation at $T_{case} = 70°C$	90	W
T_{stg}	Storage temperature	−65 to 150	°C
T_j	Max. operating junction temperature	150	°C

THERMAL DATA

$R_{thj\text{-}case}$	Thermal resistance junction-case	max 0.9 °C/W

ELECTRICAL CHARACTERISTICS ($T_{case} = 25°C$ unless otherwise specified)

Parameters		Test Contitions	Min.	Typ.	Max.	Unit
I_R	Reverse Current	$V = V_R$ $T_j = 25°C$ $V = V_R$ $T_j = 125°C$			100 4	μA mA
V_F(*)	Forward voltage	$I_F = 45A$ $T_{case} = 25°C$ $I_F = 45A$ $T_{case} = 125°C$		1.3 1.3	1.5 1.5	V V
t_{rr}	Reverse recovery time	$I_F = 1A$ $di/dt = 50A/\mu s$ $V_R = 30V$ $I_F = 45A$ $di/dt = 100A/\mu s$ $V_R = 30V$			125 400	ns ns
Q_{rr}	Recovered charge	$I_F = 45A$ $di/dt = 100A/\mu s$ $V_R = 30V$		3		μC
V_{FP}	Forward recovery overvoltage	$I_F = 45A$ $di/dt = 100A/\mu s$		11		V

* Pulsed: pulse duration $\leq 300\mu s$, duty cycle $\leq 2\%$

Fig. 1 Forward overvoltage vs. current slope

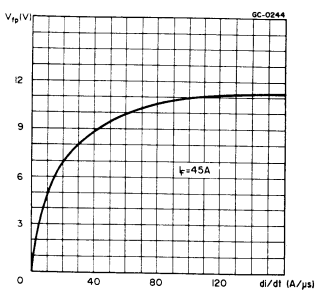


Fig. 2 Reverse leakage current vs. junction temperature

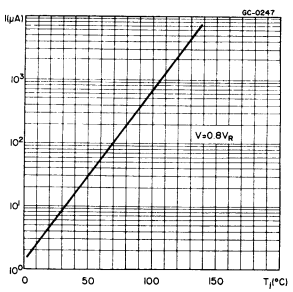
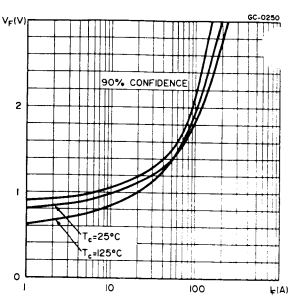


Fig. 3 Voltage drop vs. forward current



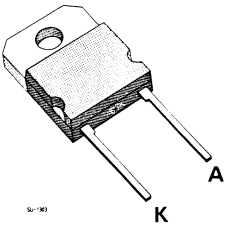
SGS60R40

ADVANCE DATA

HIGH SPEED SWITCHING APPLICATIONS

- VOLTAGE RANGE: 400V
- AVERAGE CURRENT: 60A
- VERY LOW REVERSE RECOVERY ME: t_{rr} 125ns
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING

Typical applications include freewheel diodes in motor control systems.



DIOWATT2

ABSOLUTE MAXIMUM RATINGS

V_{RRM}	Peak repetitive reverse voltage	400	V
V_{RWM}	Working peak reverse voltage	400	V
V_R	Continuous reverse voltage	400	V
I_{FRM}	Repetitive peak forward current (t = 10μs)	700	A
$I_{F(AV)}$	Average forward current T_{case} = 70°C (switching operation, δ = 0.5)	60	A
I_{FSM}	Surge non repetitive forward current (t = 10ms)	600	A
P_{tot}	Total dissipation at T_{case} = 70°C	90	W
T_{stg}	Storage temperature	−65 to 150	°C
T_j	Max. operating junction temperature	150	°C

SGS60R40

THERMAL DATA

$R_{thj\text{-}case}$	Thermal resistance junction-case	max 0.9 °C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C unless otherwise specified)

Parameters		Test Contitions	Min.	Typ.	Max.	Unit
I_R	Reverse Current	$V = V_R$ $T_j = 25°C$ $V = V_R$ $T_j = 125°C$			100 4	μA mA
V_F(*)	Forward voltage	$I_F = 60A$ $T_{case} = 25°C$ $I_F = 60A$ $T_{case} = 125°C$		1.2 1.2	1.5 1.5	V V
t_{rr}	Reverse recovery time	$I_F = 1A$ $di/dt = 50A/\mu s$ $V_R = 30V$ $I_F = 60A$ $di/dt = 100A/\mu s$ $V_R = 30V$			125 400	ns ns
Q_{rr}	Recovered charge	$I_F = 60A$ $di/dt = 100A/\mu s$ $V_R = 30V$		3		μC
V_{FP}	Forward recovery overvoltage	$I_F = 60A$ $di/dt = 100A/\mu s$		3.5		V

* Pulsed: pulse duration $\leq 300\mu s$, duty cycle $\leq 2\%$

Fig. 1 Forward overvoltage vs. current slope

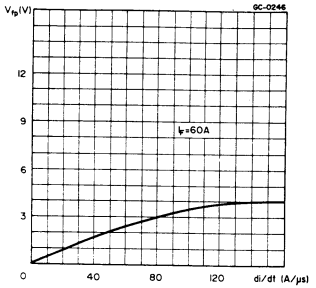


Fig. 2 Reverse leakage current vs. junction temperature

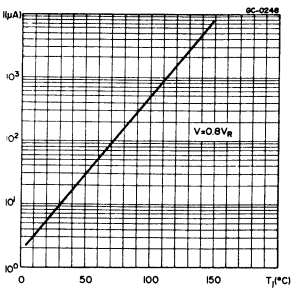


Fig. 3 Voltage drop vs. forward current