

January 7, 1998

TEL:805-498-2111 FAX:805-498-3804 WEB:<http://www.semtech.com>

AXIAL LEADED HERMETICALLY SEALED SUPERFAST RECTIFIER DIODE

- Very low reverse recovery time
- Hermetically sealed in Metoxilite fused metal oxide
- Low switching losses
- Low forward voltage drop
- Soft, non-snap off, recovery characteristics

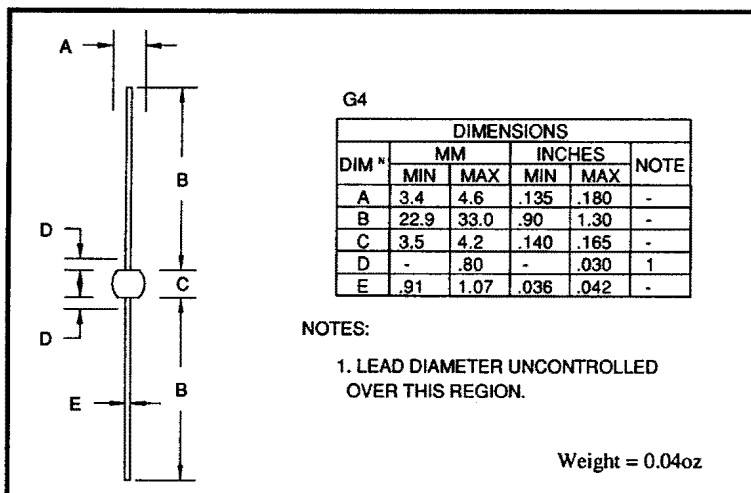
QUICK REFERENCE DATA

- $V_R = 50 - 600V$
- $I_F = 4.5A$
- $t_{rr} = 150 - 400nS$
- $I_R = 1.0\mu A$

ABSOLUTE MAXIMUM RATINGS (@ 25°C unless otherwise specified)

	Symbol	1N5415 3SF05	1N5416 3SF1	1N5417 3SF2	1N5418 3SF4	1N5419 3SF5	1N5420 3SF6	Unit
Working reverse voltage	V_{RWM}	50	100	200	400	500	600	V
Repetitive reverse voltage	V_{RRM}	50	100	200	400	500	600	V
Average forward current (@ 55°C in free air, lead length 0.375")	$I_{F(AV)}$	← 4.5 →						A
Repetitive surge current (@ 55°C in free air, lead length 0.375")	I_{FRM}	← 25 →						A
Non-repetitive surge current ($t_p = 8.3mS$, @ V_R & T_{jmax})	I_{FSM}	← 80 →						A
($t_p = 8.3mS$, @ V_R & 25°C)	I_{FSM}	← 150 →						A
Storage temperature range	T_{STG}	← -65 to +175 →						°C
Operating temperature range	T_{OP}	← -65 to +175 →						°C

MECHANICAL



These products are qualified to MIL-S-19500/411 and are preferred parts as listed in MIL-STD-701.

They can be supplied fully released as JAN, JANTX, and JANTXV versions.

These products are qualified in Europe to DEF STAN 59-61 (PART 80)/030 available to F and FX levels.

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ELECTRICAL CHARACTERISTICS (@ 25°C unless otherwise specified)

	Symbol	1N5415 3SF05	1N5416 3SF1	1N5417 3SF2	1N5418 3SF4	1N5419 3SF5	1N5420 3SF6	Unit
Average forward current max. for sine wave; $T_A = 55^\circ\text{C}$	$I_{F(AV)}$	← 3.0 →						A
Average forward current max. ($T_L = 55^\circ\text{C}$; $L = 3/8"$) for sine wave	$I_{F(AV)}$	← 4.4 →						A
for square wave	$I_{F(AV)}$	← 4.5 →						A
I^2t for fusing ($t = 8.3\text{ms}$) max.	I^2t	← 90 →						A ² S
Forward voltage drop max. @ $I_F = 3.0\text{A}$, $T_j = 25^\circ\text{C}$	V_F	← 1.1 →						V
Reverse current max. @ V_{RWM} , $T_j = 25^\circ\text{C}$	I_R	← 1.0 →						μA
@ V_{RWM} , $T_j = 100^\circ\text{C}$	I_R	← 20 →						μA
Reverse recovery time max. 0.5A I_F to 1.0A I_R . Recovers to 0.25A I_{RR} .	t_{rr}	150	150	150	150	250	400	nS
Junction capacitance typ. @ $V_R = 5\text{V}$, $f = 1\text{MHz}$	C_j	120	120	120	120	170	170	pF

THERMAL CHARACTERISTICS

	Symbol	1N5415 3SF05	1N5416 3SF1	1N5417 3SF2	1N5418 3SF4	1N5419 3SF5	1N5420 3SF6	Unit
Thermal resistance - junction to lead Lead length = 0.375"	$R_{\theta JL}$	← 20 →						°C/W
Lead length = 0.0"	$R_{\theta JL}$	← 4 →						°C/W
Thermal resistance - junction to amb. on 0.06" thick pcb. 1 oz. copper.	$R_{\theta JA}$	← 75 →						°C/W

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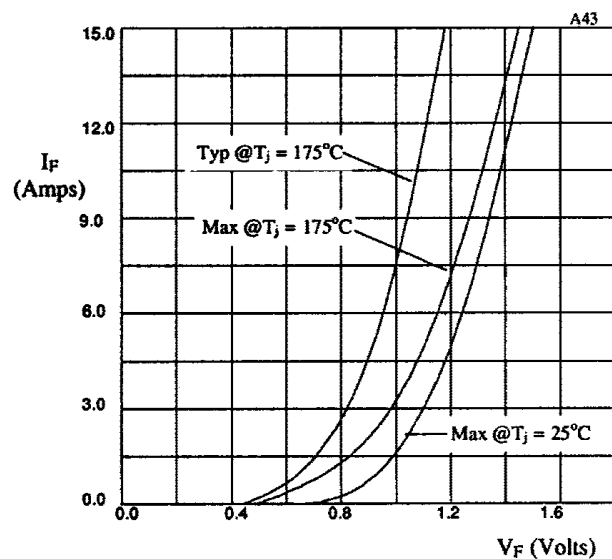


Fig 1. Forward voltage drop as a function of forward current.

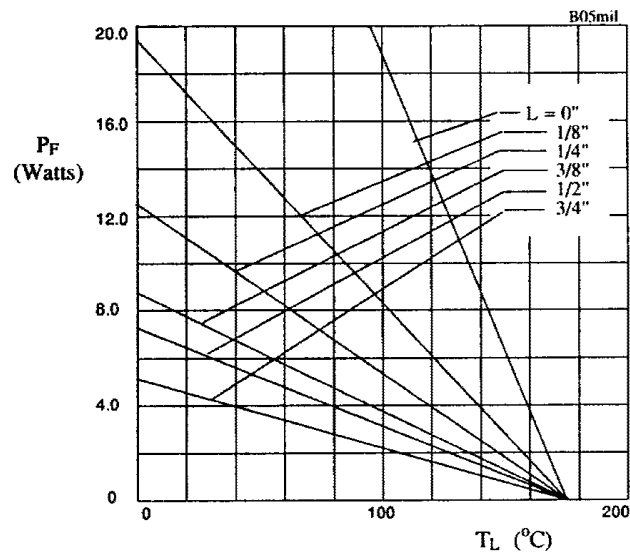


Fig 2. Maximum power versus lead temperature.

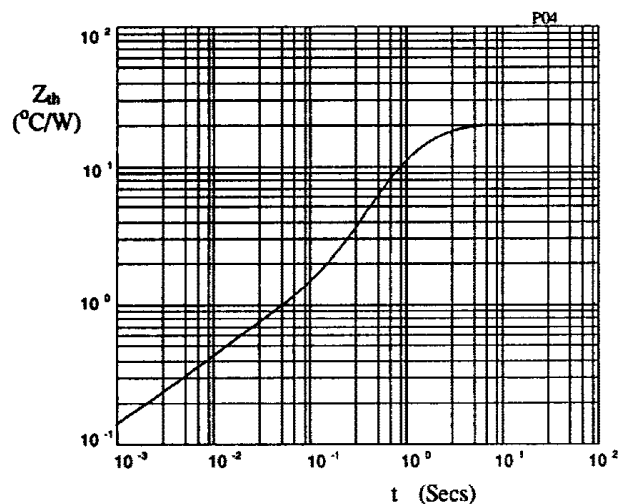


Fig 3. Transient thermal impedance characteristic.

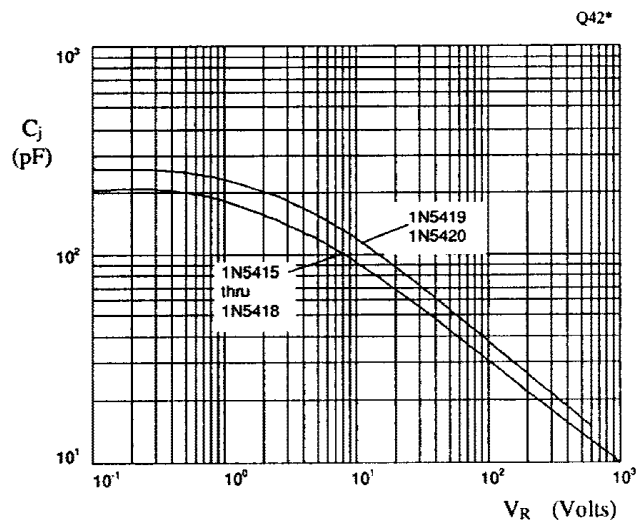


Fig 4. Typical junction capacitance as a function of reverse voltage.

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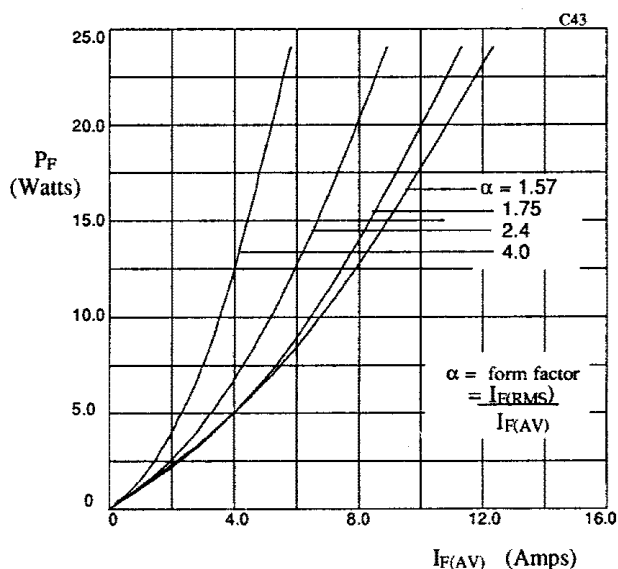


Fig 5. Forward power dissipation as a function of forward current, for sinusoidal operation.

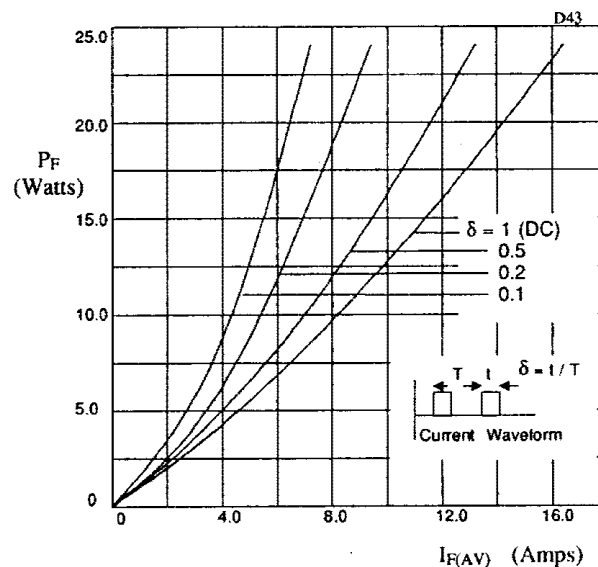


Fig 6. Forward power dissipation as a function of forward current, for square wave operation.

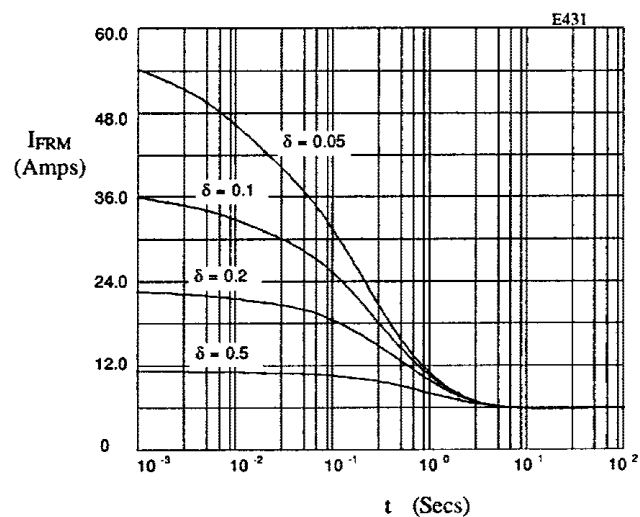


Fig 7. Typical repetitive forward current as a function of pulse width at 55°C; $R_{\theta JL} = 20 \text{ }^{\circ}\text{C/W}$; V_{RWM} during $1 - \delta$.

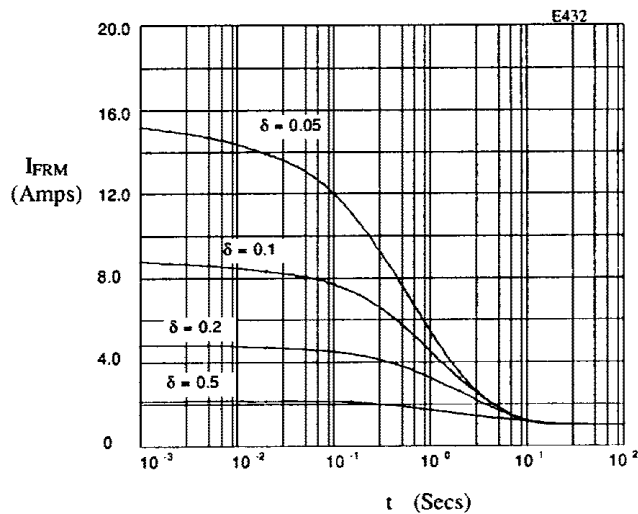


Fig 8. Typical repetitive forward current as a function of pulse width at 100°C; $R_{\theta JL} = 80 \text{ }^{\circ}\text{C/W}$; V_{RWM} during $1 - \delta$.