



Normally-ON Trench Silicon Carbide Power JFET

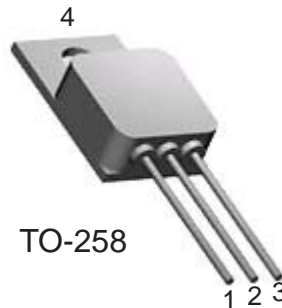
FEATURES:

« SemiSouth Die Inside

- Hermetic TO-258 Packaging
- 200°C Maximum Operating Temperature (260°C Contact Factory)
- Available Screening:
 - MIL-PRF-19500 Equivalent
 - Space Level
 - MIL-STD-750 Methods & Conditions
- Inherent Radiation Tolerance >100K TID
- Positive Temperature Coefficient for Ease of Paralleling
- Extremely Fast Switching with No "Tail" Current at 150°C
- 1200 Volt Drain-Source Blocking Voltage
- $RDS_{(on)max}$ of 0.045 Ω
- Voltage Controlled
- Low Gate Charge
- Low Intrinsic Capacitance

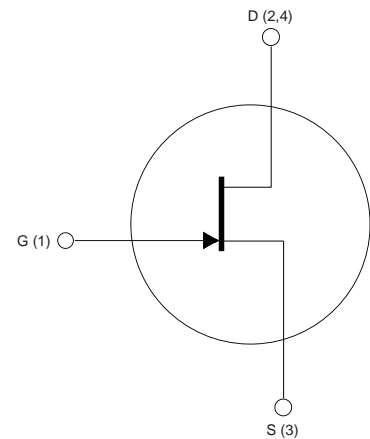
APPLICATIONS:

- Satellite Solar Inverters
- Mil Spec Power Supplies
 - Switch Mode
 - Uninterrupted
- Jet Engine Electronics
- Down-hole Electronics (Motor / Compressor Control)



TO-258

Product Summary		
BV_{DS}	1200	V
$RDS_{(ON)max}$	0.045	Ω
$E_{TS,typ}$	TBD	μJ



Internal Schematic

Non-isolated tab version shown. For isolated tab version, tab (4) is No Connect.

MAXIMUM RATINGS

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current	$I_{D, Tj=125}$	$T_j = 125\text{ }^\circ\text{C}$	50	A
	$I_{D, Tj=150}$	$T_j = 150\text{ }^\circ\text{C}$	40	
Pulsed Drain Current ⁽¹⁾	I_{DM}	$T_c = 25\text{ }^\circ\text{C}$	150	A
Short Circuit Withstand Time	t_{SC}	$V_{DD} < 800\text{ V}, T_c < 125\text{ }^\circ\text{C}$	50	μS
Power Dissipation	P_D	$T_c = 25\text{ }^\circ\text{C}$	TBD	W
Gate-Source Voltage	V_{GS}	AC ⁽²⁾	-15 to +15	V
Operating and Storage Temperature	$T_j, T_{j, stg}$		-55 to +200*	$^\circ\text{C}$
Lead Temperature for Soldering	T_{sold}	1/8" from case < 10 s	260	$^\circ\text{C}$

(1) Limited by pulse width

(2) $R_{GEXT} = 1\text{ ohm}, t_p < 200\text{ ns}$, see Figure 5 for static conditions

*Consult factory for 260 $^\circ\text{C}$

THERMAL CHARACTERISTICS

Parameter	Symbol	Value		Unit
		Typ	Max	
Thermal Resistance, junction-to-case	$R_{th,JC}$	-	TBD	$^\circ\text{C} / \text{W}$
Thermal Resistance, junction-to-ambient	$R_{th,JA}$	-	TBD	

For more products and information, please visit our website at www.micross.com

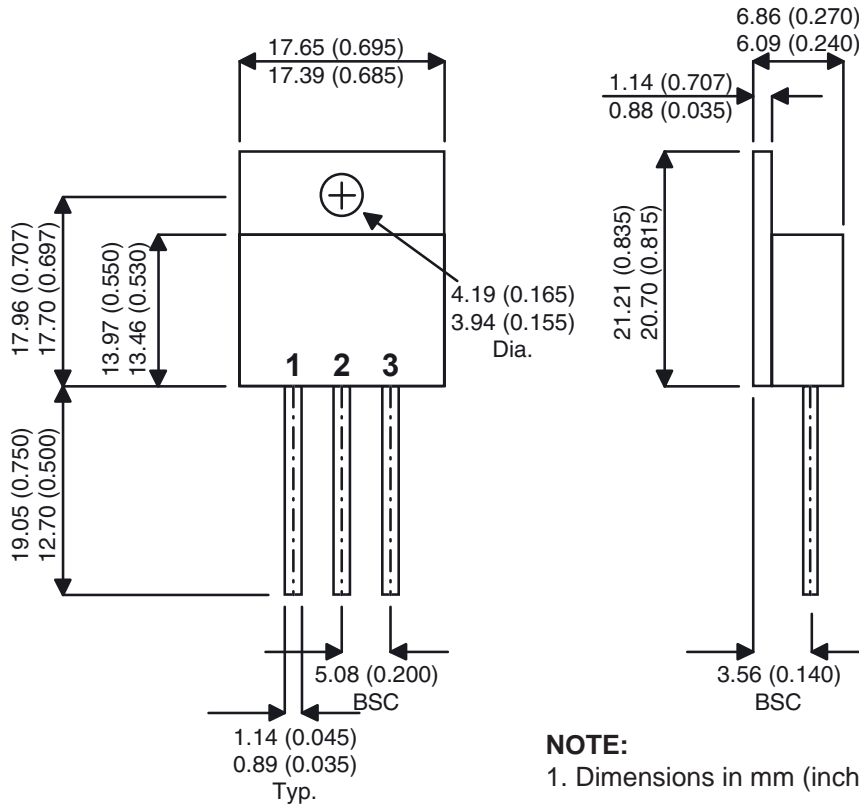


ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Off Characteristics						
Drain-Source Blocking Voltage	BV_{DS}	$V_{GS} = -15\text{ V}, I_D = 600\ \mu\text{A}$	1200	-	-	V
Total Drain Leakage Current	I_{DSS}	$V_{DS} = 1200\text{ V}, V_{GS} = -15\text{ V}, T_j = 25^\circ\text{C}$	-	2	20	μA
		$V_{DS} = 1200\text{ V}, V_{GS} = -15\text{ V}, T_j = 150^\circ\text{C}$	-	20	400	
Total Gate Reverse Leakage	I_{GSS}	$V_{GS} = -15\text{ V}, V_{DS} = 0\text{ V}$	-	-0.1	-0.6	mA
		$V_{GS} = -15\text{ V}, V_{DS} = 1200\text{ V}$	-	-0.1	-	
On Characteristics						
Drain-Source On-resistance	$R_{DS(on)}$	$I_D = 40\text{ A}, V_{GS} = 2\text{ V}, T_j = 25^\circ\text{C}$	-	0.035	0.045	Ω
		$I_D = 40\text{ A}, V_{GS} = 2\text{ V}, T_j = 100^\circ\text{C}$	-	0.07	-	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = 1\text{ V}, I_D = 34\text{ mA}$	-6.00	-	-4.00	V
Gate Forward Current	I_{GFWD}	$V_{GS} = 2\text{ V}$	-	0	-	mA
Gate Resistance	R_G	$f = 1\text{ MHz}, \text{ drain-source shorted}$	-	4	-	Ω
	$R_{G(on)}$	$V_{GS} > 2.7\text{ V}$	-	0.25	-	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DD} = 100\text{ V}$	-	1340	-	μF
Output Capacitance	C_{oss}		-	206	-	
Reverse Transfer Capacitance	C_{rss}		-	194	-	
Effective Output Capacitance, energy related	$C_{o(er)}$	$V_{DS} = 0\text{ V to } 600\text{ V}, V_{GS} = 0\text{ V}$	-	110	-	
Switching Characteristics						
Turn-On Delay	t_{on}	$V_{DS} = 600\text{ V}, I_D = 40\text{ A}, \text{ Inductive Load}, T_j = 25^\circ\text{C}$	-	TBD	-	ns
Rise Time	t_r		-	TBD	-	
Turn-Off Delay	t_{off}		-	TBD	-	
Fall Time	t_f		-	TBD	-	
Turn-On Energy	E_{on}	$V_{DS} = 600\text{ V}, I_D = 40\text{ A}, \text{ Inductive Load}, T_j = 150^\circ\text{C}$	-	TBD	-	μJ
Turn-Off Energy	E_{off}		-	TBD	-	
Total Switching Energy	E_{ts}		-	TBD	-	
Turn-On Delay	t_{on}		-	TBD	-	
Rise Time	t_r	$V_{DS} = 600\text{ V}, I_D = 40\text{ A}, \text{ Inductive Load}, T_j = 150^\circ\text{C}$	-	TBD	-	ns
Turn-Off Delay	t_{off}		-	TBD	-	
Fall Time	t_f		-	TBD	-	
Turn-On Energy	E_{on}		-	TBD	-	
Turn-Off Energy	E_{off}	$V_{DS} = 600\text{ V}, I_D = 5\text{ A}, V_{GS} = +2.5\text{ V}$	-	TBD	-	μJ
Total Switching Energy	E_{ts}		-	TBD	-	
Total Gate Charge	Q_g		-	65	-	
Gate-Source Charge	Q_{gs}		-	4	-	
Gate-Drain Charge	Q_{gd}	-	54	-	nC	



MECHANICAL DRAWING



- NOTE:**
1. Dimensions in mm (inches)
2. Controlling dimensions (inches)

ORDERING INFORMATION

<u>Base Part Number</u>	<u>Configuration</u>	<u>Package</u>	<u>Junction Temp. Range</u>	<u>Processing</u>
ASJD1200R045	Blank= Non-isolated Tab S= Isolated Tab	M=TO-258 -	EL EX	Blank /V /S

Temp Ranges: EL= Elevated Temp. Range, -55°C to 200°C (T_j)
EX= Extreme Temp. Range, -55°C to 260°C (T_j) (consult factory)

Processing: Blank = Commercial / Standard Processing
MIL-PRF-19500 Equivalent Processing Available Per SCD
/V= JANTX MIL-PRF-19500 Equivalent (future standard offering)
/S= JANS MIL-PRF-19500 Equivalent (future standard offering)

Example Part Numbers: ASJD1200R045SM-EL
ASJD1200R045M-EX

SemiSouth has commercial plastic versions of this product available. Please refer to the SemiSouth website <http://www.semisouth.com/products/products.html> for datasheet specifications and ordering information. The SemiSouth part number is SJD120R045 and is supplied in a TO-247 plastic package.



DOCUMENT TITLE

Normally-ON Trench Silicon Carbide Power JFET

<u>Rev #</u>	<u>History</u>	<u>Release Date</u>	<u>Status</u>
0.0	Initial Release	December 2010	Advanced Information
0.1	Replaced TO-257 package with TO-258 package	June 2011	Advance Information