SEMITRONICS CORP.

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SEF40604

POWER MOSFET

FEATURES

- Isolated Case
- Hermetically Sealed Package
- High dv.dt
- Low $R_{DS(on)}$ 0.35 Ohms
- Eutectic Die Attachment for Hi Reliability
- MIL STX Screening Available

APPLICATIONS

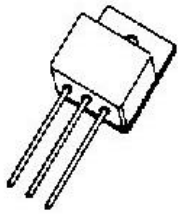
- High Reliability Power Supplies
- Switch Mode Power Supplies
- Battery Back-Up Supplies
- High Speed Power Switching

DESCRIPTION

The SEF40604 is a 20 Amp, 600 volts, 0.35 ohms. Power Mosfet packaged in three lead hermetically sealed TO-258 metallic package.

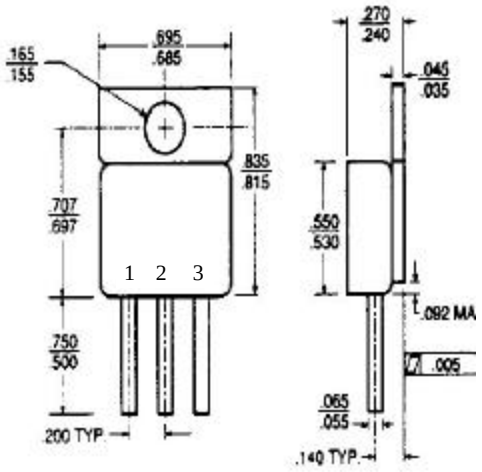
Custom Lead Forming Available
Ceramic Feedthroughs Available
Add STX suffix for Military screening

PACKAGE



T0-258AA

CASE OUTLINE



Pin 1: D Pin 2: S Pin 3: G

Absolute Maximum Ratings

Parameter		Maximum	Units
Continuous Drain Current	I_D @ Tc = 25º C,	20	A
Continuous Drain Current	I_{AR} @ Tc = 25ºC	20	A
Pulse Drain Current	I_{DM} @ Tc = 25ºC	80	A
Power Dissipation	P_D @ Tc =25º C	300	W
Gate-to-Source Voltage	V_{GS}	± 20	V
Peak Diode Recovery	dv/dt	5.0	V/ns
Operating & Storage Temperature	Tj & T_{STG}	-55 to +150	ºC

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Static @ Tj = 25°C (unless otherwise specified)

Parameter		Min.	Typ.	Max.	Units	Conditions
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	600	—	—	V	V_{GS} = 0V, I_D = 250uA
Static Drain to Source On-Resistance	$R_{DS(on)}$	—	—	0.35	Ù	V_{GS} = 10V, I_D = 10A
Gate Threshold Voltage	V_{GS}	2.0	—	4.5	V	V_{DS} = V_{GS}, I_D = 4 mA
Drain-to-Source Leakage Current	I_{DSS}	—	—	250	uA	V_{DS} = 480V, V_{GS} = 0V
		—	—	1000		V_{DS} = 480V, V_{GS} = 0V, Tj =125°C
Gate-to-Source Forward Leakage	I_{GSS}	—	—	100	nA	V_{GS} = 20V
Gate-to-Source Forward Leakage	I_{GSS}	—	—	-100		V_{GS} = -20V

Dynamic @ Tj = 25°C (unless otherwise specified)

Parameter		Min.	Typ.	Max.	Units	Conditions
Forward Transconductance	gfs	11	18	—	S	V_{DS} = 10V, I_D = 10A pulse
Total Gate Charge	Qg	—	151	170	nC	I_D = 10A V_{DS} = 300V V_{GS} = 10V
Gate-to-Source Charge	Qgs	—	29	40		
Gate-to-Drain (“Miller”) charge	Qgd	—	60	85		
Turn-on-Delay Time	$t_{d(on)}$	—	20	40	ns	V_{GS} = 10V V_{DS} = 300V I_D = 10A R_G = 2 Ohms
Rise Time	t_r	—	43	60		
Turn-Off-Delay Time	$t_{d(off)}$	—	70	90		
Fall time	t_f	—	40	60		
Input Capacitance	C_{iss}	—	4500	—	pF	V_{GS} = 0V V_{DS} = 25V f = 1.0 MHZ
Output Capacitance	C_{oss}	—	420	—		
Reverse Transfer Capacitance	C_{rss}	—	140	—		

Avalanche Characteristics

Parameter		Typ.	Max.	Units
Repetitive Avalanche Energy @ T_C = 25° C	E_{AR}	—	30	mJ

Thermal Resistance

Parameter		Typ.	Max.	Units
Junction-to-case	$R_{\theta JC}$	—	0.42	°C/W
Case-to-Sink, flat, Greased Surface	$R_{\theta CS}$	0.25	—	

Diode Characteristics

Parameter		Min.	Typ.	Max.	Units	Conditions
Continuous Source Current	I_S	—	—	20	A	Tj = 25°C
Pulsed Source Current	I_{SM}	—	—	80		
Diode Forward Voltage	V_{SD}	—	—	1.5	V	Tj = 25°C, I_S=20A, V_{GS}=0V
Reverse Recovery Time	t_{rr}	—	—	250	ns	Tj = 25°C, I_F=20A di/dt = 100A/us V_R = 100 V
Reverse Recovery Charge	Q_{rr}	—	1		uC	
Reverse Recovery Current	I_{RM}		10		A	Tj = 25°C

Fig. 1 Output Characteristics

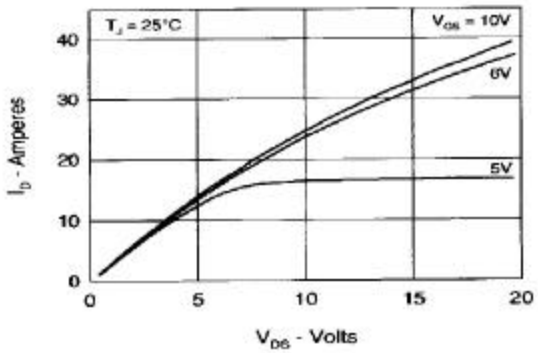

Fig. 2 Input Admittance

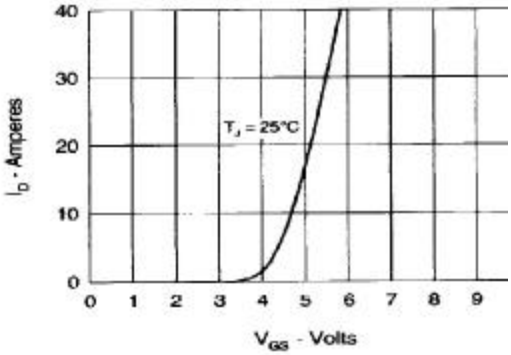

Fig. 3 $R_{DS(on)}$ vs. Drain Current

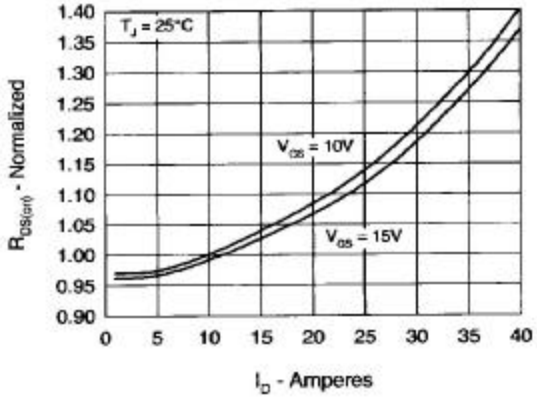

Fig. 4 Temperature Dependence of Drain to Source Resistance

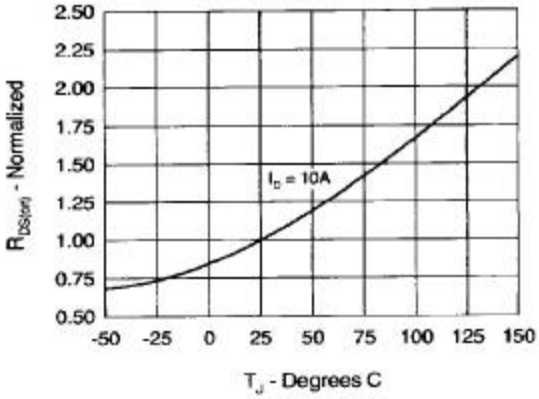

Fig. 5 Drain Current vs. Case Temperature

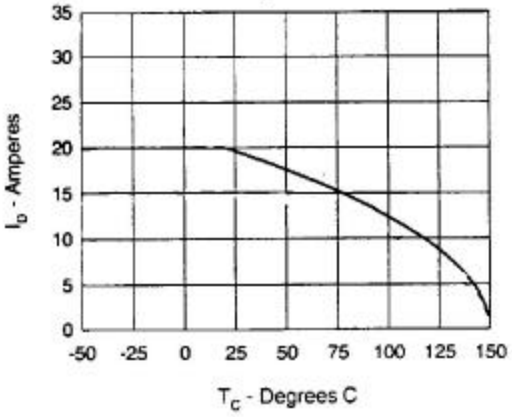

Fig. 6 Temperature Dependence of Breakdown and Threshold Voltage