FW297

Power MOSFET
60V, 58mΩ, 4.5A, Dual N-Channel

ON Semiconductor®

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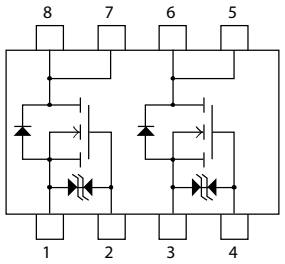
V_{DSS}	R_{DS}(on) Max	I_D Max
60V	58mΩ@ 10V	4.5A
	84mΩ@ 4.5V	
	95mΩ@ 4.0V	

Features

- Low On-Resistance
- 4.0V Drive
- ESD Diode-Protected Gate
- Pb-Free, Halogen Free and RoHS Compliance

Electrical Connection
N-Channel

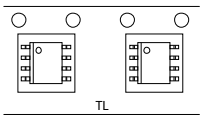


Specifications

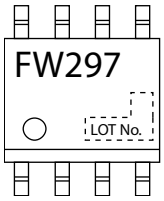
Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Value	Unit
Drain to Source Voltage	V_{DSS}	60	V
Gate to Source Voltage	V_{GSS}	±20	V
Drain Current (DC)	I_D	4.5	A
Drain Current (Pulse) PW ≤ 10μs, duty cycle ≤ 1%	I_{DP}	18	A
Power Dissipation When mounted on ceramic substrate (2000mm^2 × 0.8mm) 1 unit, PW≤10s	P_D	1.8	W
Total Dissipation When mounted on ceramic substrate (2000mm^2 × 0.8mm) , PW≤10s	P_T	2.2	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	−55 to +150	°C

Packing Type : TL



Marking



Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to Ambient 1 unit, PW≤10s *1	$R_{\theta JA}$	69.4	°C/W
Junction to Ambient 2 units, PW≤10s *1	$R_{\theta JA}$	56.8	

Note: *1 When mounted on ceramic substrate (2000mm^2 × 0.8mm)

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

ORDERING INFORMATION

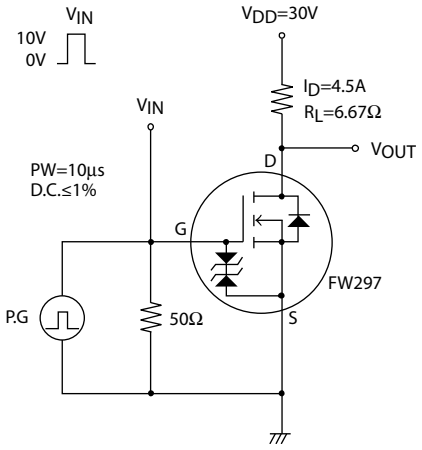
See detailed ordering and shipping information on page 5 of this data sheet.

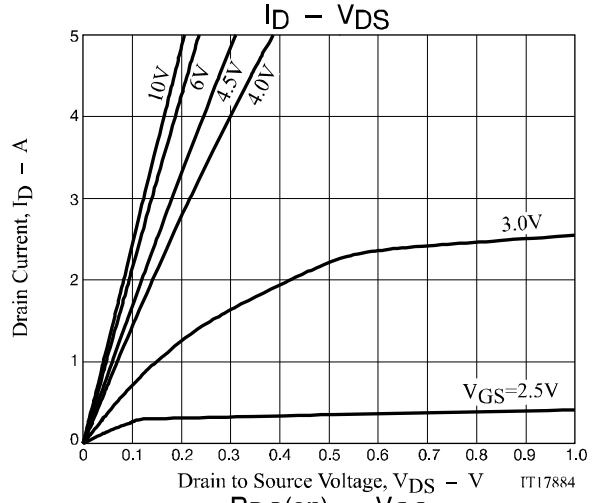
Electrical Characteristics at Ta = 25°C

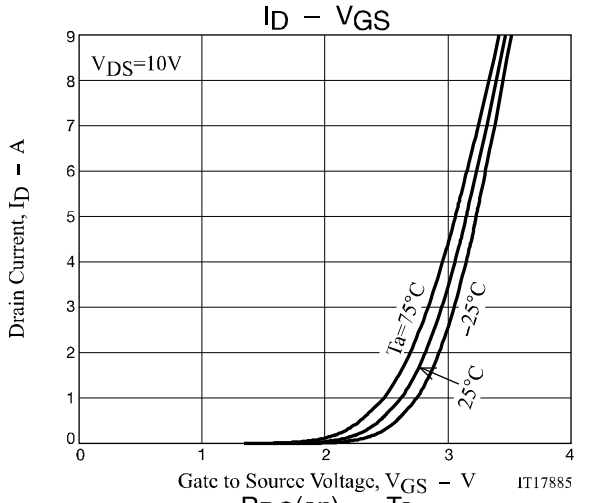
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	60			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Gate Threshold Voltage	$V_{GS}(th)$	V_{DS}=10V, I_D=1mA	1.2		2.6	V
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=4.5A		4.7		S
Static Drain to Source On-State Resistance	$R_{DS}(on)1$	I_D=4.5A, V_{GS}=10V		45	58	mΩ
	$R_{DS}(on)2$	I_D=2A, V_{GS}=4.5V		60	84	mΩ
	$R_{DS}(on)3$	I_D=2A, V_{GS}=4.0V		68	95	mΩ
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		750		pF
Output Capacitance	Coss			59		pF
Reverse Transfer Capacitance	Crss			47		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		7		ns
Rise Time	t_r			16		ns
Turn-OFF Delay Time	$t_d(off)$			50		ns
Fall Time	t_f			30		ns
Total Gate Charge	Qg	V_{DS}=30V, V_{GS}=10V, I_D=4.5A		14		nC
Gate to Source Charge	Qgs			2.3		nC
Gate to Drain “Miller” Charge	Qgd			2.8		nC
Forward Diode Voltage	V_{SD}	I_S=4.5A, V_{GS}=0V		0.81	1.2	V

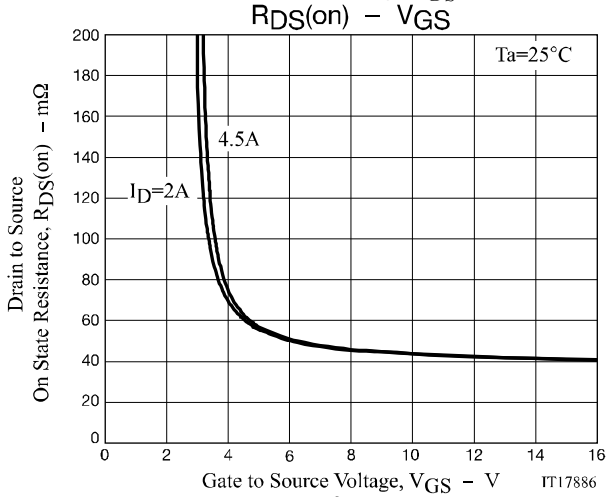
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

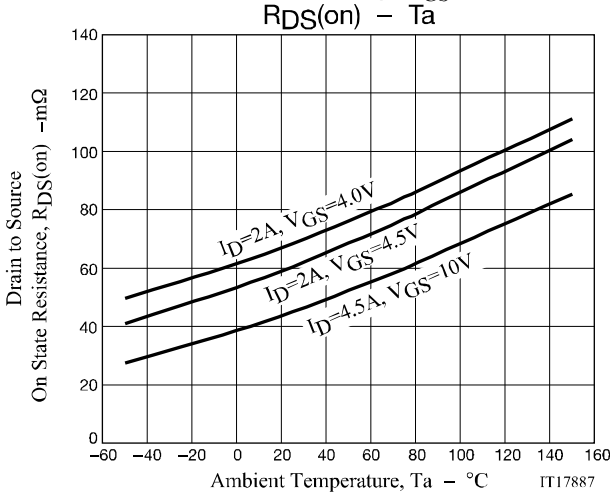
Switching Time Test Circuit

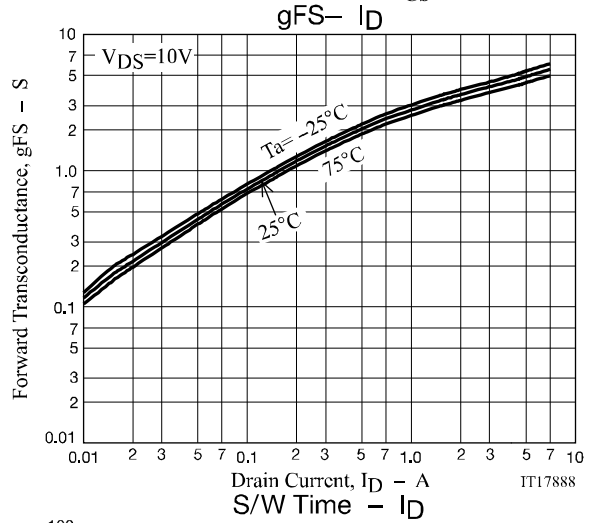


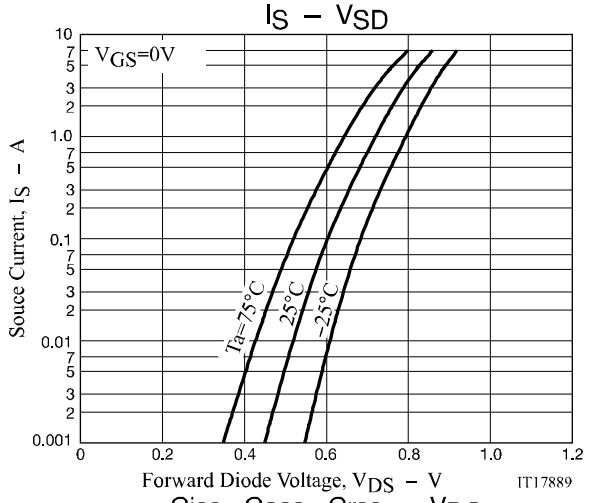

ID – VDS
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT17884
10V
6V
4.5V
4.0V
3.0V
VGS=2.5V

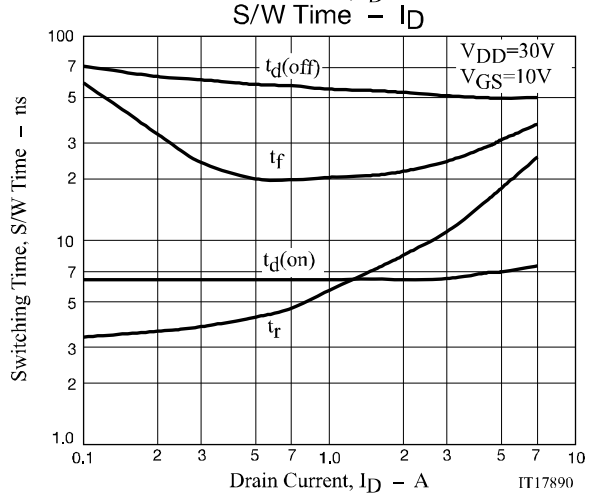

ID – VGS
Drain Current, ID – A
Gate to Source Voltage, VGS – V
IT17885
VDS=10V
Ta=75°C
–25°C
25°C

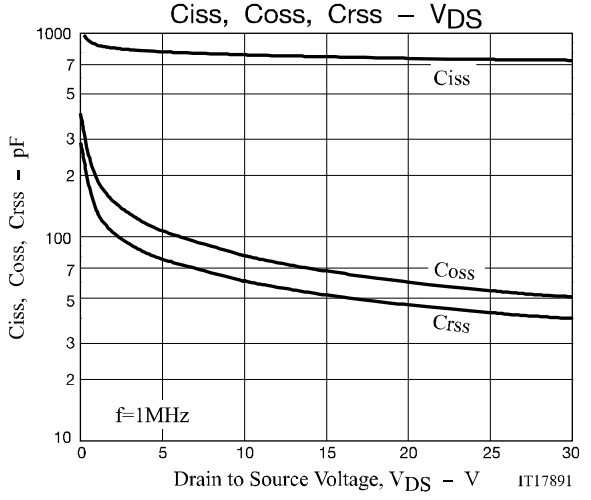

RDS(on) – VGS
Drain to Source
On State Resistance, RDS(on) – mΩ
Gate to Source Voltage, VGS – V
IT17886
Ta=25°C
4.5A
ID=2A

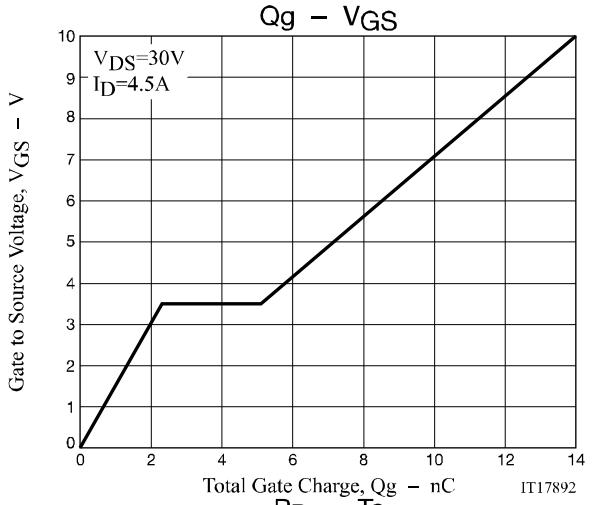

RDS(on) – Ta
Drain to Source
On State Resistance, RDS(on) –mΩ
Ambient Temperature, Ta – °C
IT17887
ID=2A, VGS=4.0V
ID=2A, VGS=4.5V
ID=4.5A, VGS=10V

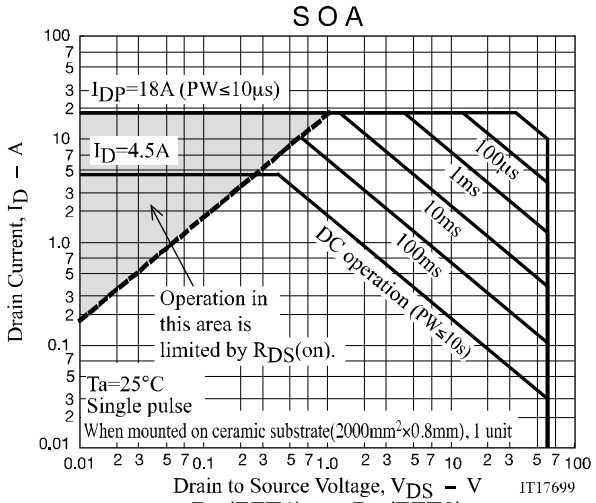

gFS– ID
Forward Transconductance, gFS – S
Drain Current, ID – A
IT17888
VDS=10V
Ta= –25°C
75°C
25°C

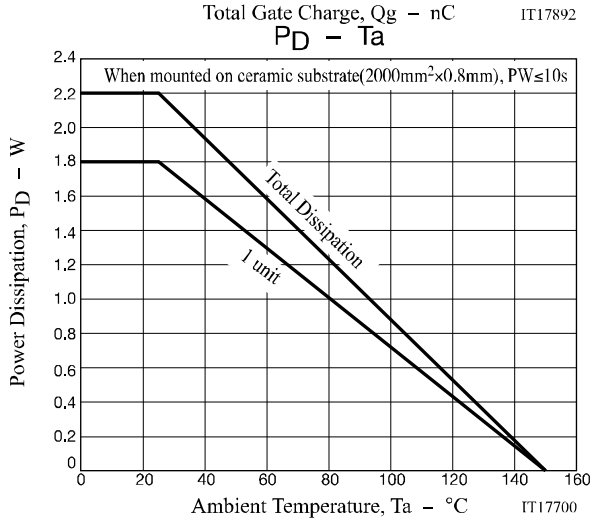

IS – VSD
Souce Current, IS – A
Forward Diode Voltage, VDS – V
IT17889
VGS=0V
Ta=75°C
25°C
–25°C

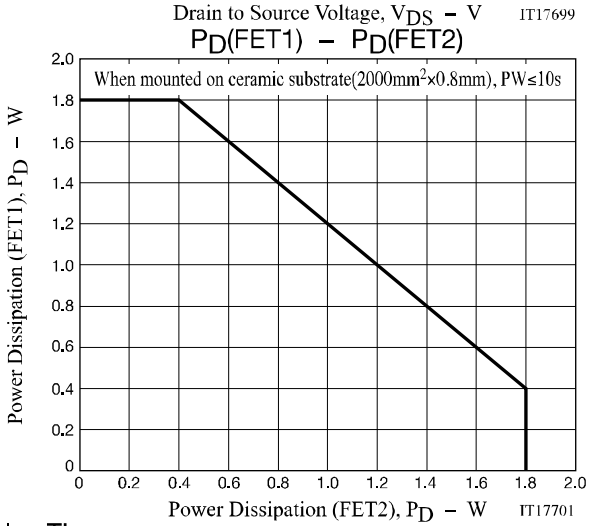

S/W Time – ID
Switching Time, S/W Time – ns
Drain Current, ID – A
IT17890
VDD=30V
VGS=10V
td(off)
tf
td(on)
tr

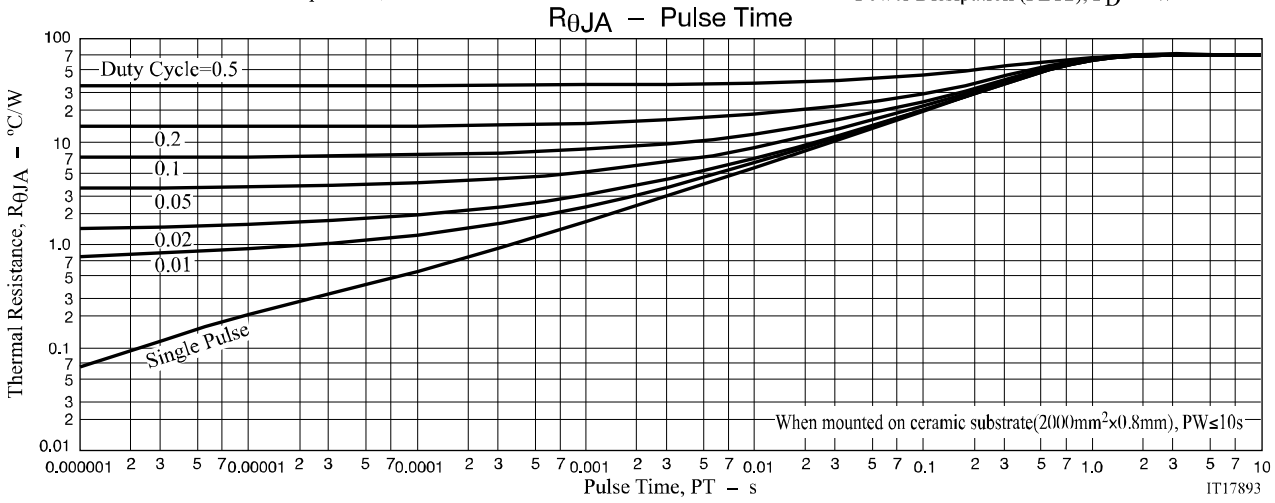

Ciss, Coss, Crss – VDS
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT17891
Ciss
Coss
Crss
f=1MHz


Qg – VGS
VDS=30V
ID=4.5A
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT17892


S O A
IDP=18A (PW≤10μs)
ID=4.5A
100μs
1ms
10ms
100ms
DC operation (PW≤10s)
Operation in this area is limited by RDS(on).
Ta=25°C
Single pulse
When mounted on ceramic substrate(2000mm2×0.8mm), 1 unit
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT17699


PD – Ta
When mounted on ceramic substrate(2000mm2×0.8mm), PW≤10s
Total Dissipation
1 unit
Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT17700


PD(FET1) – PD(FET2)
When mounted on ceramic substrate(2000mm2×0.8mm), PW≤10s
Power Dissipation (FET1), PD – W
Power Dissipation (FET2), PD – W
IT17701


RθJA – Pulse Time
Duty Cycle=0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse
When mounted on ceramic substrate(2000mm2×0.8mm), PW≤10s
Thermal Resistance, RθJA – °C/W
Pulse Time, PT – s
IT17893

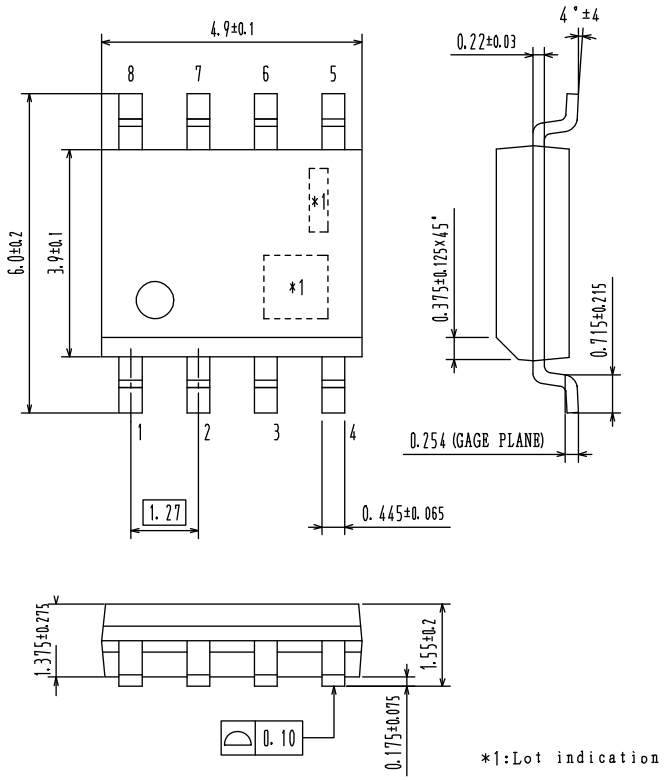
Package Dimensions

FW297-TL-2W

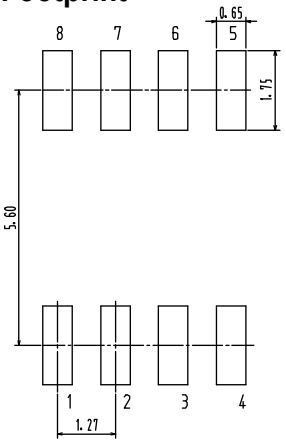
SOIC-8

CASE 751CR
ISSUE O
Unit : mm

1: Source1
2: Gate1
3: Source2
4: Gate2
5: Drain2
6: Drain2
7: Drain1
8: Drain1



Recommended Soldering Footprint



ORDERING INFORMATION

Device	Package	Shipping	Note
FW297-TL-2W	SOIC8 SC-87, SOT-96	2,500 pcs. / Tape & Reel	Pb-Free and Halogen Free

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D. http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF

Note on usage : Since the FW297 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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