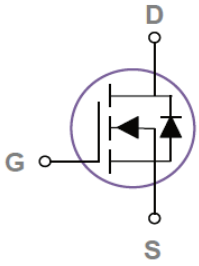
DACO SEMICONDUCTOR CO.,LTD.

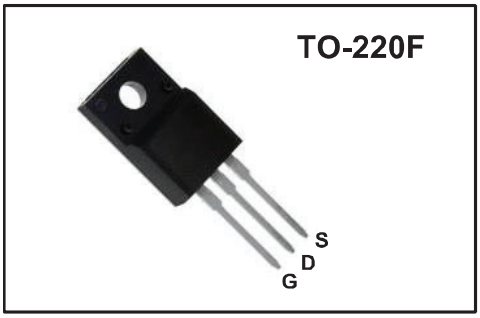
DAM4N651F

N-Channel Enhancement Mode MOSFET

Features

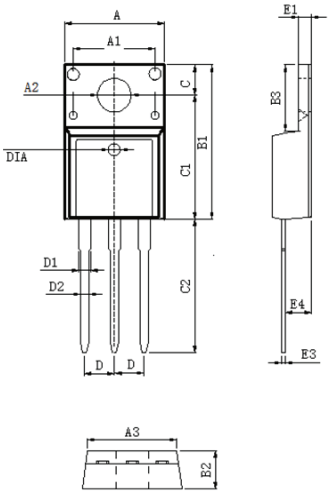
- V_{DSS} = 650V
- $R_{DS(ON)}$ Typ.2.2Ω @ V_{GS} = 10V
- Fully Avalanche Rated
- Pb Free & RoHS Compliant





Applications

- Backlighting
- Power Converters
- Synchronous Rectifiers



Absolute Maximum Ratings (Tc=25°C unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain Source Voltage	V_{DS}	650	V
Gate Source Voltage	V_{GS}	±30	V
Drain Current Continuous @ T_C = 25°C @ T_C = 100°C	I_D	4 2.5	A
Drain Current Pulsed@ T_C = 25°C	I_{DM}	16	A
Single Pulse Avalanche Energy	EAS	245	mJ
Single Pulse Avalanche Current	IAS	4	A
Maximum Power Dissipation	P_D	28	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Thermal Resistance Junction to Case Note3	$R_{\theta Jc}$	4.4	°C/W

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	10.460	9.860	0.412	0.388
A1	7.100	6.900	0.280	0.272
A2	3.500	3.100	0.138	0.122
A3	9.900	9.500	0.390	0.374
B1	16.170	15.570	0.637	0.613
B2	4.900	4.500	0.193	0.177
B3	6.880	6.480	0.271	0.255
C	3.500	3.100	0.138	0.122
C1	12.870	12.270	0.507	0.483
C2	13.380	12.580	0.527	0.495
D	2.590	2.490	0.102	0.098
D1	1.470	1.070	0.058	0.042
D2	0.900	0.700	0.035	0.028
E1	2.740	2.340	0.108	0.092
E3	0.600	0.400	0.024	0.016
E4	2.960	2.560	0.117	0.101
DIA	Φ1.5 TYP.	deep0.1 TYP.	Φ0.059 TYP.	deep0.004 TYP.

Electrical Characteristics @ T_J=25°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
OFF Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_{DS}=250uA	650	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V , V_{DS}=650V	-	-	1	uA
Gate-Body Leakage	I_{GSS}	V_{GS}=±30V , V_{DS}=0V	-	-	±100	nA
ON Characteristics						
Gate Threshold Voltage	V_{TH}	V_{DS}=V_{GS} , I_{DS}=250uA	2.5	3.5	4.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V , I_{DS}=2A	-	2.2	2.6	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=25V V_{GS}=0V Freq.=1MHz	-	518	900	pF
Output Capacitance	C_{oss}		-	41.6	80	
Reverse Transfer Capacitance	C_{rss}		-	4.5	9	
Switching Characteristics						
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=325V V_{GS}=10V R_G =10Ω I_{DS}=4A	-	15.4	30	ns
Rise Time	T_r		-	14.8	29	
Turn-Off Delay Time	$T_{d(off)}$		-	43.7	65	
Fall Time	T_f		-	10.5	20	
Total Gate Charge	Q_g	V_{DS}=520V V_{GS}=10V I_{DS}=4A	-	15.4	30	nC
Gate to Source Charge	Q_{gs}		-	2	4	
Gate to Drain Charge	Q_{gd}		-	7.3	14	
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V , I_S=1A	-	-	1	V

Notes:

1.Pulse Test: Pulse Width ≦ 300μs, Duty Cycle ≦ 2%.

2. V_{DD}=50V,V_{GS}=10V,L=30mH,I_{AS}=4A.,R_G=25Ω, Starting T_J=25°C

3. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins.

$R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design. $R_{\theta JA}$ shown below for single device operation on FR-4 in still air.

Typical Characteristics

Fig.1 Continuous Drain Current vs. T_C

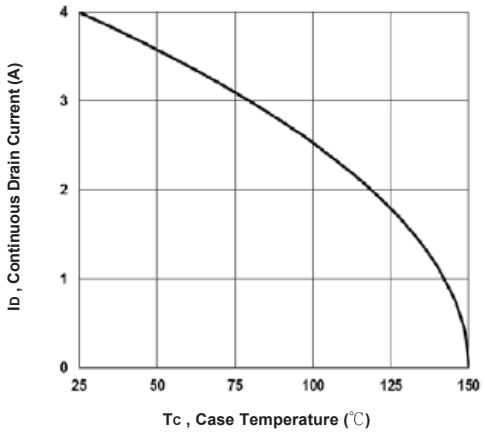


Fig.2 Normalized RDSON vs. T_J

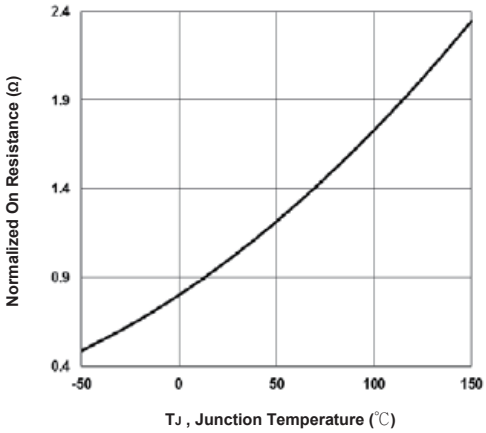


Fig.3 Normalized Vth vs. T_J

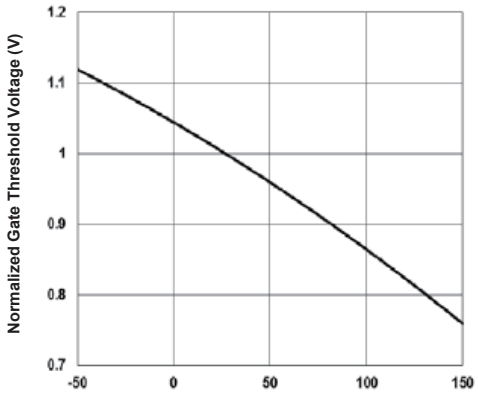


Fig.4 Gate Charge Waveform

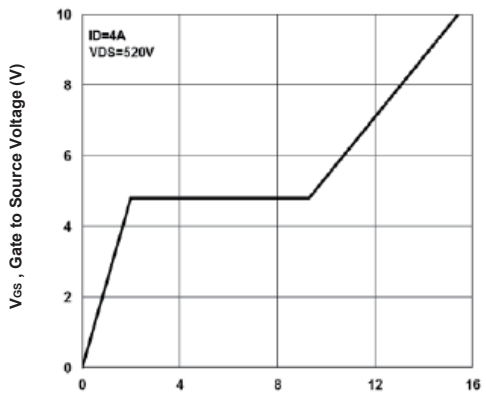


Fig.5 Normalized Transient Impedance

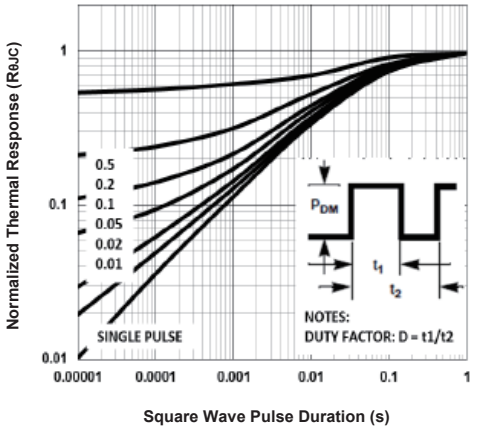
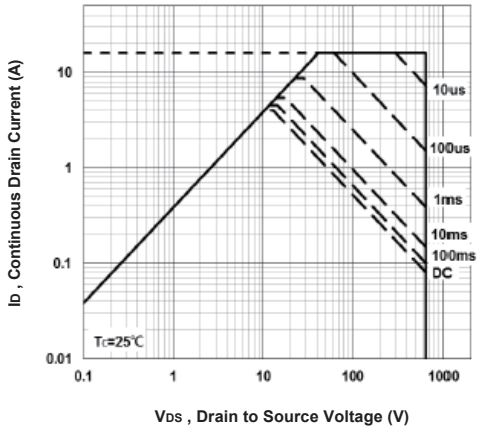


Fig.6 Maximum Safe Operation Area



Typical Characteristics

Fig.7 Switching Time Waveform

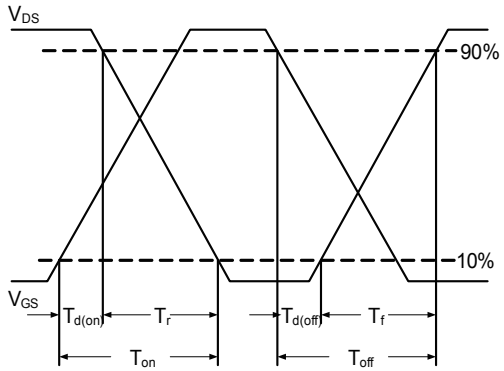
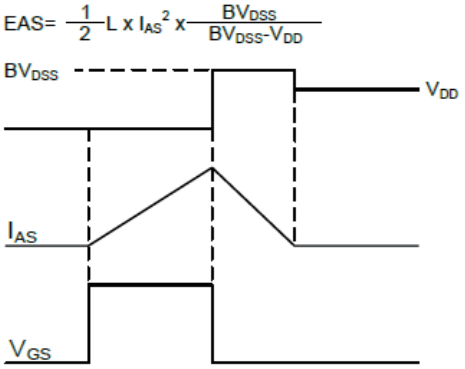



Fig.8 EAS Waveform