



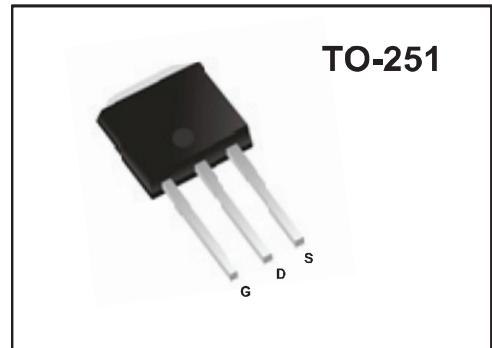
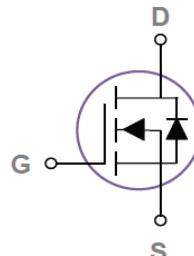
DACO SEMICONDUCTOR CO., LTD.

DAMJ4N700B

## N-Channel Enhancement Mode MOSFET

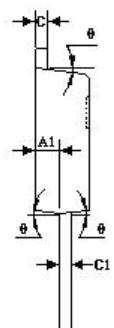
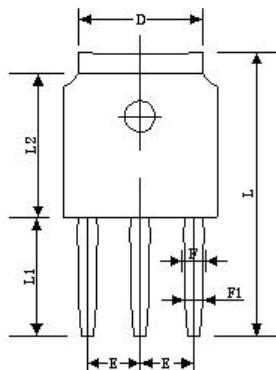
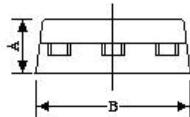
### Features

- ◆  $V_{DSS} = 700V$
- ◆  $R_{DS(ON)}$  Typ.  $0.83\Omega$  @  $V_{GS} = 10V$
- ◆ High ruggedness performance
- ◆ Super-Junction technology
- ◆ Pb Free & RoHS Compliant



### Applications

- ◆ Backlighting
- ◆ Power Converters
- ◆ Synchronous Rectifiers



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.400	2.200	0.094	0.087
A1	1.110	0.910	0.044	0.036
B	6.700	6.500	0.264	0.256
C	0.580	0.460	0.023	0.018
C1	0.580	0.460	0.023	0.018
D	5.460	5.100	0.215	0.201
E	2.386	2.186	0.094	0.086
F	0.940	0.740	0.037	0.029
F1	0.860	0.660	0.034	0.026
L	12.300	11.700	0.484	0.461
L1	5.200	4.800	0.205	0.189
L2	6.200	6.000	0.244	0.236
θ	9°	3°	9°	3°

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

Parameter	Symbol	Ratings	Unit
Drain Source Voltage	$V_{DS}$	700	V
Gate Source Voltage	$V_{GS}$	$\pm 30$	V
Drain Current Continuous @ $T_c = 25^\circ C$ @ $T_c = 100^\circ C$	$I_D$	4 2.5	A
Drain Current Pulsed@ $T_c = 25^\circ C$	$I_{DM}$	12	A
Single Pulse Avalanche Energy	EAS	45	mJ
Single Pulse Avalanche Current	IAS	3	A
Maximum Power Dissipation	$P_D$	50	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 <sup>Note3</sup>	$R_{\theta JC}$	2.5	°C/W



**DACO SEMICONDUCTOR CO., LTD.**

**DAMJ4N700B**

**Electrical Characteristics @  $T_J=25^\circ\text{C}$  (unless otherwise specified)**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>OFF Characteristics</b>						
Drain-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	$\text{V}_{\text{GS}}=0\text{V}$ , $\text{I}_{\text{DS}}=250\mu\text{A}$	700	-	-	V
Zero Gate Voltage Drain Current	$\text{I}_{\text{DS}}$	$\text{V}_{\text{GS}}=0\text{V}$ , $\text{V}_{\text{DS}}=700\text{V}$	-	-	1	$\mu\text{A}$
Gate-Body Leakage	$\text{I}_{\text{GSS}}$	$\text{V}_{\text{GS}}=\pm 30\text{V}$ , $\text{V}_{\text{DS}}=0\text{V}$	-	-	$\pm 100$	$\text{nA}$
<b>ON Characteristics</b>						
Gate Threshold Voltage	$\text{V}_{\text{TH}}$	$\text{V}_{\text{DS}}=\text{V}_{\text{GS}}$ , $\text{I}_{\text{DS}}=250\mu\text{A}$	2.5	3.5	4.5	V
Static Drain-Source On-Resistance	$\text{R}_{\text{DS(on)}}$	$\text{V}_{\text{GS}}=10\text{V}$ , $\text{I}_{\text{DS}}=2\text{A}$	-	0.83	0.93	$\Omega$
<b>Dynamic Characteristics</b>						
Input Capacitance	$\text{C}_{\text{iss}}$	$\text{V}_{\text{DS}}=25\text{V}$ $\text{V}_{\text{GS}}=0\text{V}$ Freq.=1MHz	-	450	700	pF
Output Capacitance	$\text{C}_{\text{oss}}$		-	300	450	
Reverse Transfer Capacitance	$\text{C}_{\text{rss}}$		-	5	10	
<b>Switching Characteristics</b>						
Turn-On Delay Time	$\text{T}_{\text{d(on)}}$	$\text{V}_{\text{DD}}=300\text{V}$ $\text{V}_{\text{GS}}=10\text{V}$ $\text{R}_G=12\Omega$ $\text{I}_{\text{DS}}=2\text{A}$	-	13	20	ns
Rise Time	$\text{T}_r$		-	12	19	
Turn-Off Delay Time	$\text{T}_{\text{d(off)}}$		-	31	50	
Fall Time	$\text{T}_f$		-	9	17	
Total Gate Charge	$\text{Q}_g$	$\text{V}_{\text{DS}}=480\text{V}$ $\text{V}_{\text{GS}}=10\text{V}$ $\text{I}_{\text{DS}}=2\text{A}$	-	13	20	nC
Gate to Source Charge	$\text{Q}_{\text{gs}}$		-	3	6	
Gate to Drain Charge	$\text{Q}_{\text{gd}}$		-	6	12	
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage	$\text{V}_{\text{SD}}$	$\text{V}_{\text{GS}}=0\text{V}$ , $\text{I}_{\text{S}}=2\text{A}$	-	-	1.2	V

Notes:

1. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

2.  $\text{V}_{\text{DD}}=50\text{V}$ ,  $\text{V}_{\text{GS}}=10\text{V}$ ,  $\text{L}=10\text{mH}$ ,  $\text{I}_{\text{AS}}=3\text{A}$ ,  $\text{R}_G=1.46\Omega$ , Starting  $T_J=25^\circ\text{C}$

3.  $\text{R}_{\theta JA}$  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.

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



## Typical Characteristics

Fig.1 Output Characteristics

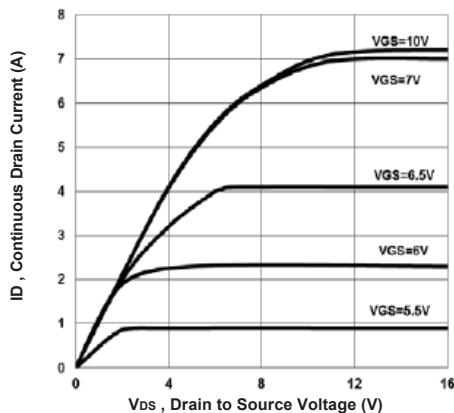
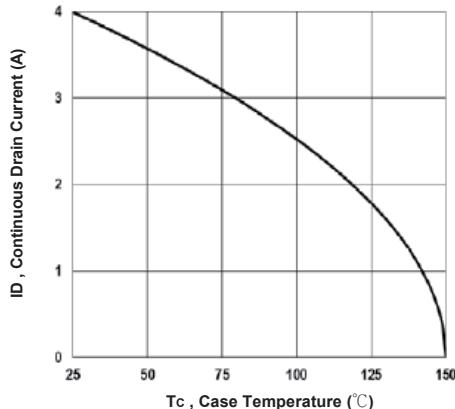
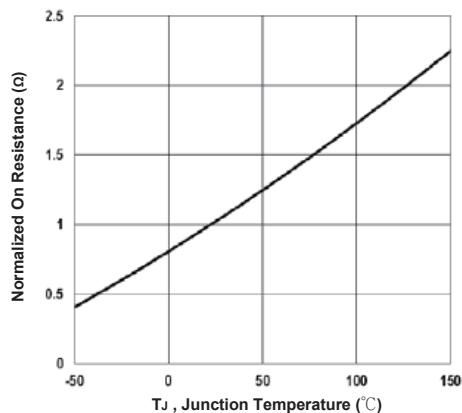
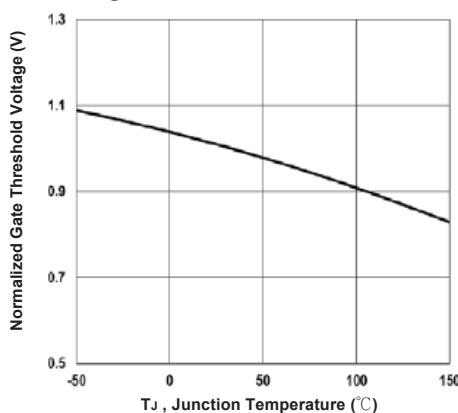
Fig.2 Continuous Drain Current vs.  $T_c$ Fig.3 Normalized RDSON vs.  $T_J$ Fig.4 Normalized V<sub>th</sub> vs.  $T_J$ 

Fig.5 Gate Charge Waveform

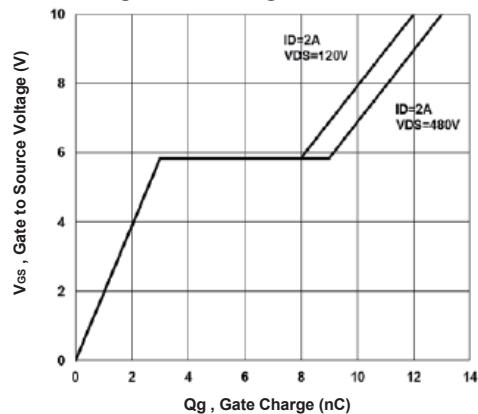
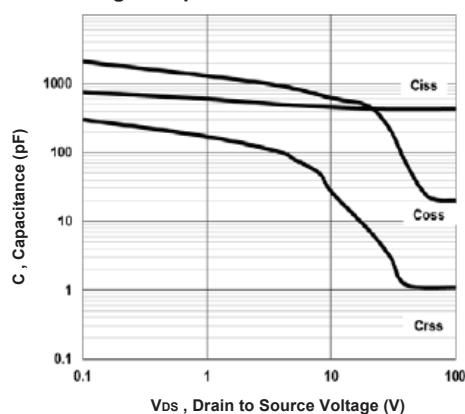


Fig.6 Capacitance Characteristics





### Typical Characteristics

Fig.7 Normalized Transient Impedance

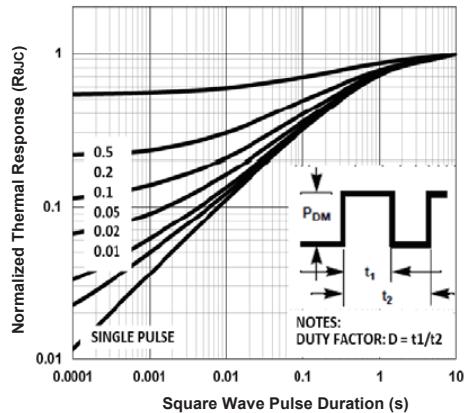


Fig.8 Maximum Safe Operation Area

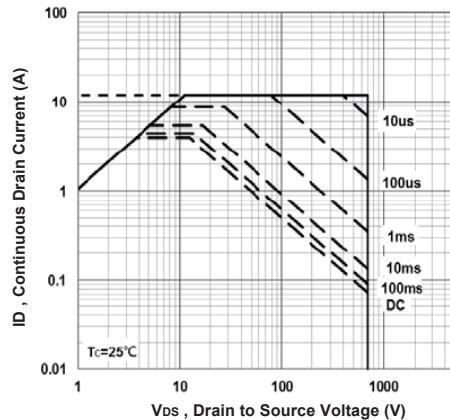


Fig.9 Switching Time Waveform

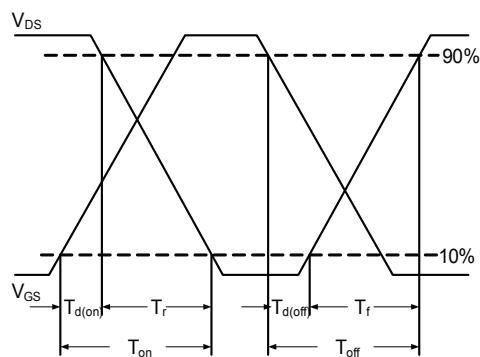


Fig.10 EAS Waveform

