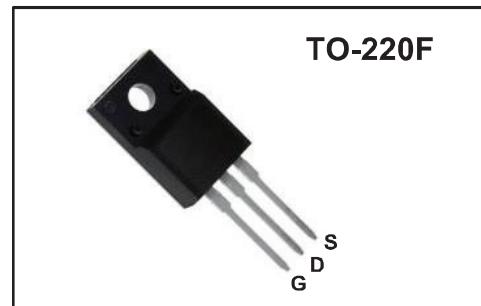
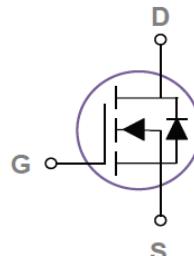




## N-Channel Enhancement Mode MOSFET

### Features

- ◆  $V_{DSS} = 650V$
- ◆  $R_{DS(ON)}$  Typ.  $0.33\Omega$  @  $V_{GS} = 10V$
- ◆ High ruggedness performance
- ◆ Super-Junction technology
- ◆ Pb Free & RoHS Compliant

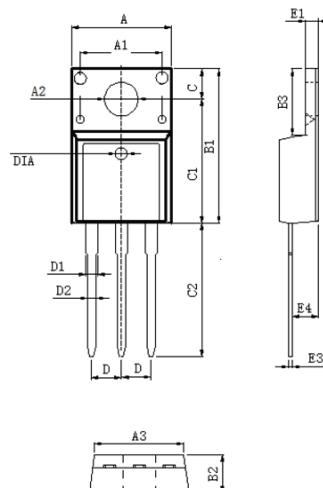


### Applications

- ◆ Backlighting
- ◆ Power Converters
- ◆ Synchronous Rectifiers

### Absolute Maximum Ratings ( $T_C=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain Source Voltage	$V_{DS}$	650	V
Gate Source Voltage	$V_{GS}$	$\pm 30$	V
Drain Current Continuous @ $T_c = 25^\circ C$ @ $T_c = 100^\circ C$	$I_D$	11 6.7	A
Drain Current Pulsed@ $T_c = 25^\circ C$	$I_{DM}$	44	A
Single Pulse Avalanche Energy	$E_{AS}$	272	mJ
Single Pulse Avalanche Current	$I_{AS}$	7.1	A
Maximum Power Dissipation	$P_D$	31.2	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 <small>Note3</small>	$R_{θJC}$	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.



DACO SEMICONDUCTOR CO., LTD.

DAMJ11N650F

### 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	$\text{BV}_{\text{DSS}}$	$\text{V}_{\text{GS}}=0\text{V}$ , $\text{I}_{\text{DS}}=250\mu\text{A}$	650	-	-	V
Zero Gate Voltage Drain Current	$\text{I}_{\text{DS}}$	$\text{V}_{\text{GS}}=0\text{V}$ , $\text{V}_{\text{DS}}=650\text{V}$	-	-	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	-	4	V
Static Drain-Source On-Resistance	$\text{R}_{\text{DS(on)}}$	$\text{V}_{\text{GS}}=10\text{V}$ , $\text{I}_{\text{DS}}=5.5\text{A}$	-	0.33	0.38	$\Omega$
<b>Dynamic Characteristics</b>						
Input Capacitance	$\text{C}_{\text{iss}}$	$\text{V}_{\text{DS}}=50\text{V}$ $\text{V}_{\text{GS}}=0\text{V}$ Freq.=1MHz	-	690	-	pF
Output Capacitance	$\text{C}_{\text{oss}}$		-	57	-	
Reverse Transfer Capacitance	$\text{C}_{\text{rss}}$		-	2.47	-	
<b>Switching Characteristics</b>						
Turn-On Delay Time	$\text{T}_{\text{d(on)}}$	$\text{V}_{\text{DD}}=380\text{V}$ $\text{V}_{\text{GS}}=10\text{V}$ $\text{R}_G=25\Omega$ $\text{I}_{\text{DS}}=11\text{A}$	-	26	-	ns
Rise Time	$\text{T}_r$		-	28.3	-	
Turn-Off Delay Time	$\text{T}_{\text{d(off)}}$		-	34	-	
Fall Time	$\text{T}_f$		-	33.2	-	
Total Gate Charge	$\text{Q}_g$	$\text{V}_{\text{DS}}=480\text{V}$ $\text{V}_{\text{GS}}=10\text{V}$ $\text{I}_{\text{DS}}=11\text{A}$	-	13	-	nC
Gate to Source Charge	$\text{Q}_{\text{gs}}$		-	3.6	-	
Gate to Drain Charge	$\text{Q}_{\text{gd}}$		-	5.6	-	
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage	$\text{V}_{\text{SD}}$	$\text{V}_{\text{GS}}=0\text{V}$ , $\text{I}_{\text{S}}=11\text{A}$	-	-	1.3	V

#### Notes:

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

2.  $\text{V}_{\text{DD}}=50\text{V}$ ,  $\text{V}_{\text{GS}}=10\text{V}$ ,  $\text{L}=10.8\text{mH}$ ,  $\text{I}_{\text{AS}}=7.1$ ,  $\text{R}_G=25\Omega$ , Starting  $T_J=25^\circ\text{C}$

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

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



## Typical Characteristics

Fig.1 Continuous Drain Current vs. T<sub>c</sub>

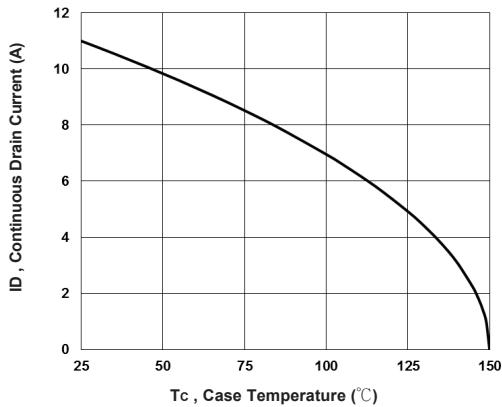


Fig.2 Normalized RDSON vs. T<sub>J</sub>

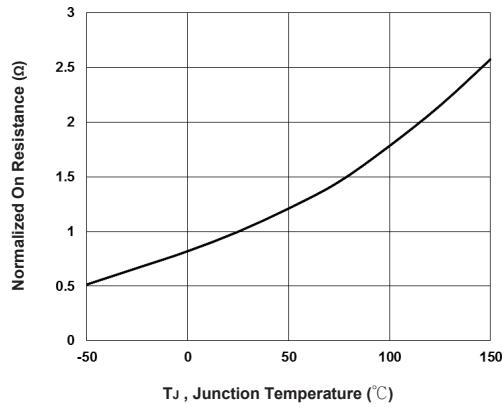


Fig.3 Normalized V<sub>th</sub> vs. T<sub>J</sub>

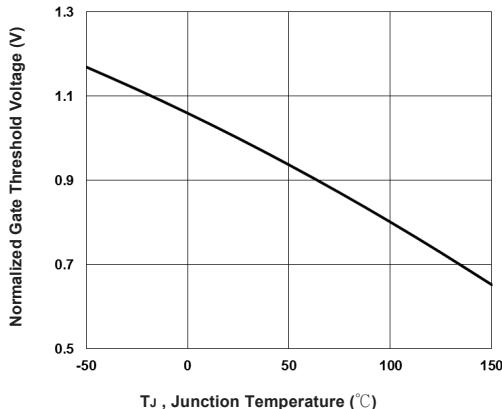


Fig.4 Gate Charge Waveform

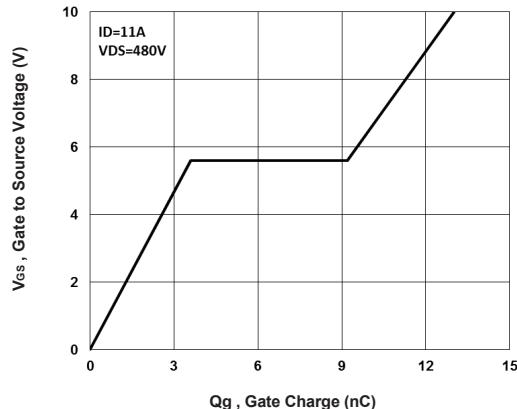


Fig.5 Normalized Transient Impedance

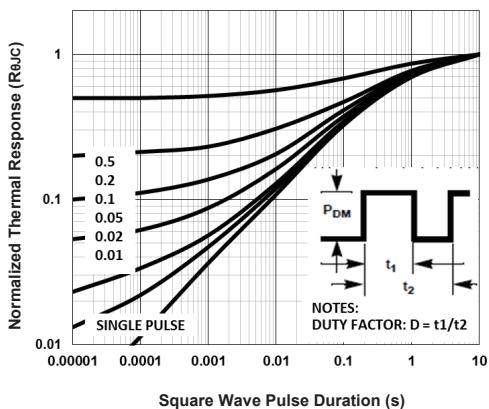
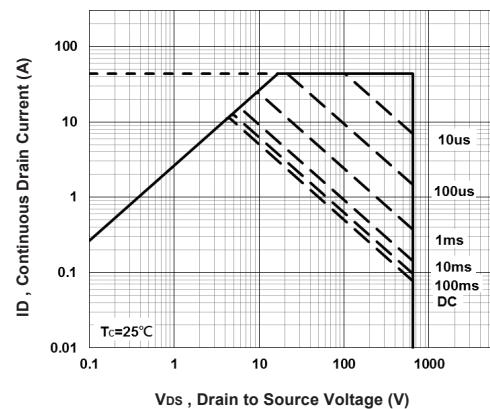


Fig.6 Maximum Safe Operation Area





### Typical Characteristics

Fig.7 Switching Time Waveform

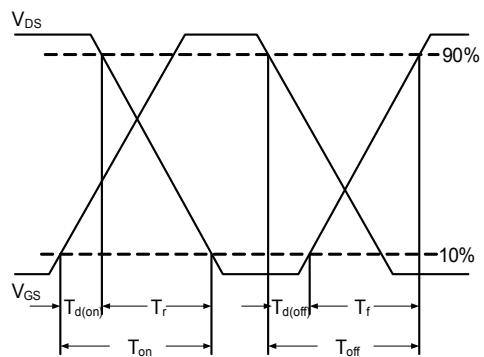


Fig.8 EAS Waveform

