



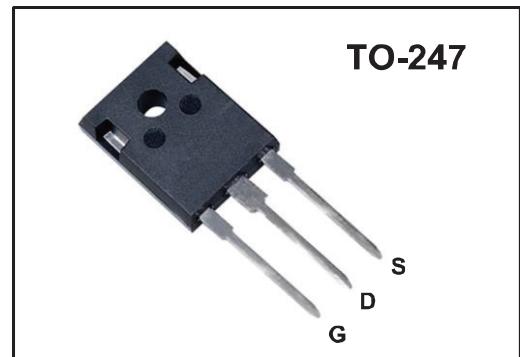
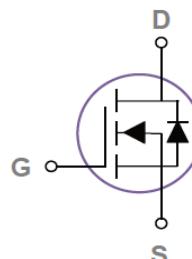
DACO SEMICONDUCTOR CO., LTD.

DAMJ20N600P

N-Channel Enhancement Mode MOSFET

Features

- ◆ $V_{DSS} = 600V$
- ◆ $R_{DS(ON)}$ Typ. 0.15Ω @ $V_{GS} = 10V$
- ◆ High ruggedness performance
- ◆ Super-Junction technology
- ◆ Pb Free & RoHS Compliant

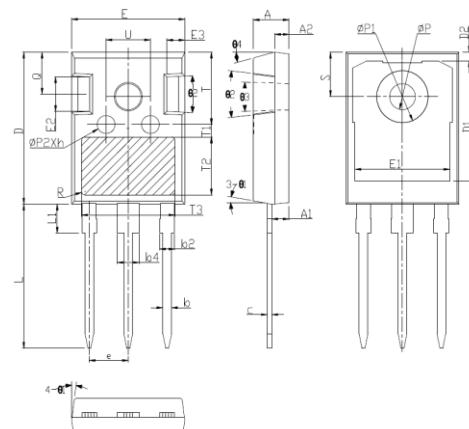


Applications

- ◆ Backlighting
- ◆ Power Converters
- ◆ Synchronous Rectifiers

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

Parameter	Symbol	Ratings	Unit
Drain Source Voltage	V_{DS}	600	V
Gate Source Voltage	V_{GS}	± 30	V
Drain Current Continuous @ $T_c = 25^\circ C$ @ $T_c = 100^\circ C$	I_D	20 12.6	A
Drain Current Pulsed@ $T_c = 25^\circ C$	I_{DM}	80	A
Single Pulse Avalanche Energy	E_{AS}	120	mJ
Single Pulse Avalanche Current	I_{AS}	4.9	A
Maximum Power Dissipation	P_D	152	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>	$R_{θJC}$	0.82	°C/W



Symbol	Dimensions In Millimeters			Symbol	Dimensions In Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	4.75	5.00	5.25	L	19.52	19.92	20.32
A1	2.16	2.41	2.66	L1	—	—	4.30
A2	1.85	2.00	2.15	ΦP	3.35	3.60	3.85
b	1.11	1.20	1.35	ΦP1	—	—	7.30
b2	1.90	2.01	2.25	ΦP2	2.25	2.50	2.75
b4	2.90	3.10	3.25	Q	5.50	5.80	6.10
c	0.51	0.61	0.75	S	6.15BSC		
D	20.60	21.00	21.40	R	0.50REF		
D1	16.15	16.55	16.95	T	9.70	—	10.30
D2	1.00	1.20	1.40	T1	1.65REF		
E	15.50	15.80	16.10	T2	8.00REF		
E1	13.00	13.30	13.60	T3	12.80REF		
E2	4.70	5.00	5.30	U	5.90	—	6.50
E3	2.25	2.50	2.75	θ1	3°	7°	10°
e	5.44BSC			θ2	2°	5°	8°
h	0.00	0.10	0.25	θ3	1°	—	2°
				θ4	10°	15°	20°



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DAMJ20N600P

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
OFF Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$\text{V}_{\text{GS}}=0\text{V}$, $\text{I}_{\text{DS}}=250\mu\text{A}$	600	-	-	V
Zero Gate Voltage Drain Current	I_{DS}	$\text{V}_{\text{GS}}=0\text{V}$, $\text{V}_{\text{DS}}=600\text{V}$	-	-	1	μA
Gate-Body Leakage	I_{GSS}	$\text{V}_{\text{GS}}=\pm 30\text{V}$, $\text{V}_{\text{DS}}=0\text{V}$	-	-	± 100	nA
ON Characteristics						
Gate Threshold Voltage	V_{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	$\text{R}_{\text{DS(on)}}$	$\text{V}_{\text{GS}}=10\text{V}$, $\text{I}_{\text{DS}}=26.5\text{A}$	-	0.15	0.18	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$\text{V}_{\text{DS}}=50\text{V}$ $\text{V}_{\text{GS}}=0\text{V}$ Freq.=1MHz	-	1440	-	pF
Output Capacitance	C_{oss}		-	105	-	
Reverse Transfer Capacitance	C_{rss}		-	3.94	-	
Switching Characteristics						
Turn-On Delay Time	$\text{T}_{\text{d(on)}}$	$\text{V}_{\text{DD}}=480\text{V}$ $\text{V}_{\text{GS}}=10\text{V}$ $\text{R}_G=25\Omega$ $\text{I}_{\text{DS}}=20\text{A}$	-	40.3	-	ns
Rise Time	T_r		-	49.3	-	
Turn-Off Delay Time	$\text{T}_{\text{d(off)}}$		-	60	-	
Fall Time	T_f		-	59.2	-	
Total Gate Charge	Q_g	$\text{V}_{\text{DS}}=480\text{V}$ $\text{V}_{\text{GS}}=10\text{V}$ $\text{I}_{\text{DS}}=20\text{A}$	-	23.3	-	nC
Gate to Source Charge	Q_{gs}		-	6.6	-	
Gate to Drain Charge	Q_{gd}		-	8.3	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	$\text{V}_{\text{GS}}=0\text{V}$, $\text{I}_{\text{S}}=20\text{A}$	-	-	1.4	V

Notes:

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

2. $\text{V}_{\text{DD}}=100\text{V}$, $\text{V}_{\text{GS}}=10\text{V}$, $\text{L}=10\text{mH}$, $\text{I}_{\text{AS}}=4.9\text{A}$, $\text{R}_G=25\Omega$, Starting $\text{T}_j=25^\circ\text{C}$

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 Continuous Drain Current vs. Tc

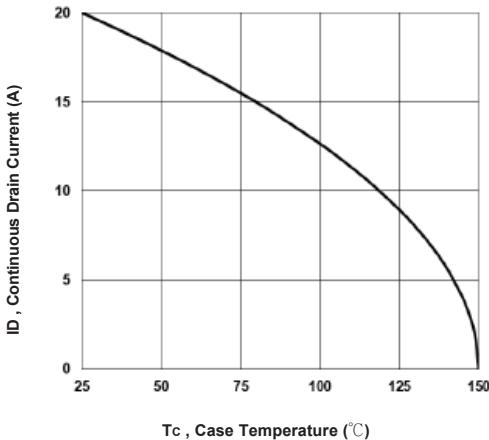


Fig.2 Normalized RDSON vs. TJ

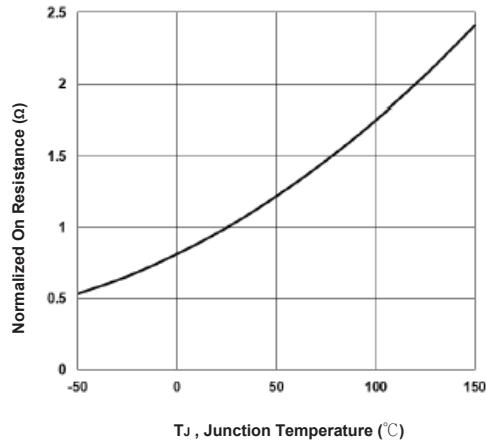


Fig.3 Normalized Vth vs. TJ

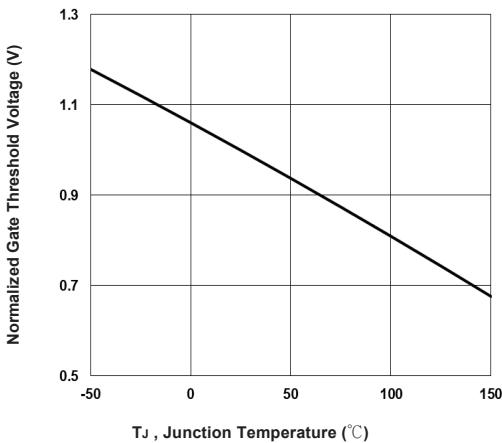


Fig.4 Gate Charge Waveform

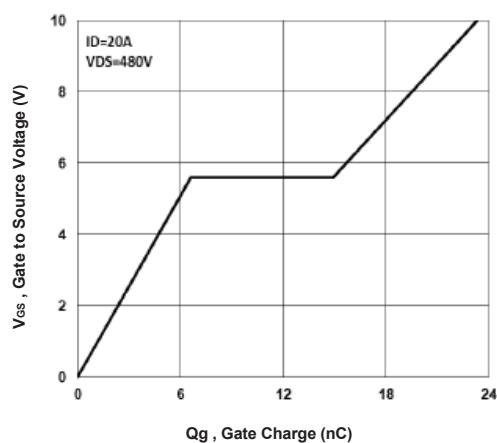


Fig.5 Normalized Transient Impedance

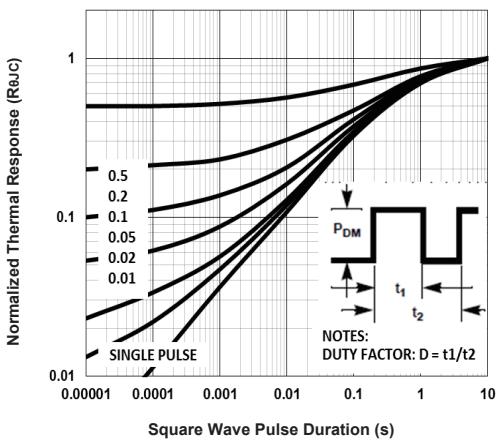
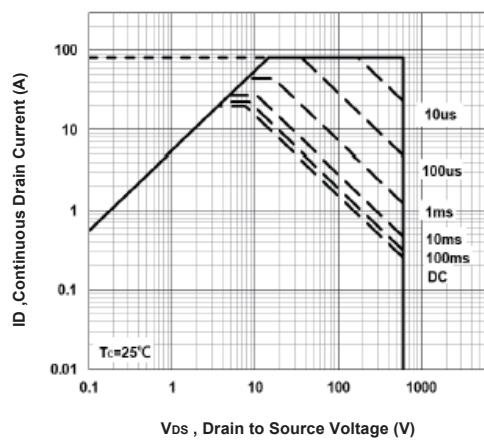


Fig.6 Maximum Safe Operation Area





Typical Characteristics

Fig.7 Switching Time Waveform

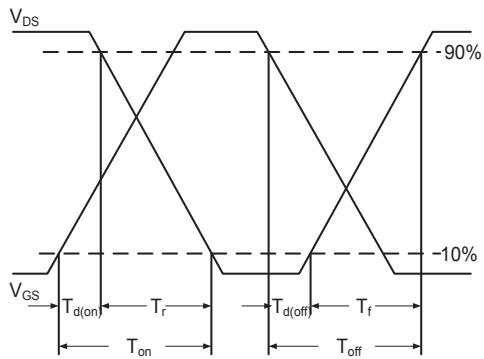


Fig.8 EAS Waveform

