

### Features

- Advanced Trench MOS Technology
- 100% EAS Guaranteed
- High Current Capability
- Green Device Available

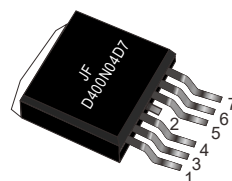
### Applications

- SMPS Synchronous Rectification
- DC/DC Converters
- Or-ing

### Product Summary

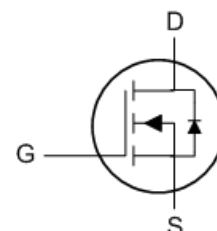
BVDSS	RDSON	ID
40V	1.1mΩ	400A

### TO-263-7L Pin Configuration



Pin Definition:

1. Gate
2. Drain
- 3/4/5/6/7. Source



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	40	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ (Silicon Limited)	400	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ (Silicon Limited)	280	A
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ (Wire Bond Limited)	240	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	1610	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	673	mJ
$I_{AS}$	Avalanche Current	116	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation <sup>4</sup>	380	W
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 175	$^\circ C$

### Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>1</sup>	---	40	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	---	0.4	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=10V, I_D=195A$	---	0.9	1.1	m $\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	2	2.8	4	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=32V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	$\mu A$
		$V_{DS}=32V, V_{GS}=0V, T_J=55^\circ\text{C}$	---	---	5	
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
$R_g$	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	---	1.2	---	$\Omega$
$Q_g$	Total Gate Charge	$V_{DS}=20V, V_{GS}=10V, I_D=20A$	---	108	---	nC
$Q_{gs}$	Gate-Source Charge		---	25.4	---	
$Q_{gd}$	Gate-Drain Charge		---	26.8	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=20V, V_{GS}=10V, R_G=1.5\Omega, I_D=20A$	---	20	---	ns
$T_r$	Rise Time		---	145	---	
$T_{d(off)}$	Turn-Off Delay Time		---	55	---	
$T_f$	Fall Time		---	18	---	
$C_{iss}$	Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1\text{MHz}$	---	6601	---	$\mu F$
$C_{oss}$	Output Capacitance		---	2073	---	
$C_{rss}$	Reverse Transfer Capacitance		---	248	---	
<b>Diode Characteristics</b>						
$I_S$	Continuous Source Current <sup>1,5</sup>	$V_G=V_D=0V, \text{Force Current}$	---	---	240	A
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=195A, T_J=25^\circ\text{C}$	---	---	1.2	V

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is  $V_{DD}=25V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=240A$
- 4.The power dissipation is limited by 175 $^\circ\text{C}$  junction temperature
- 5.Package limitation current is 240 A.

## Typical Characteristics

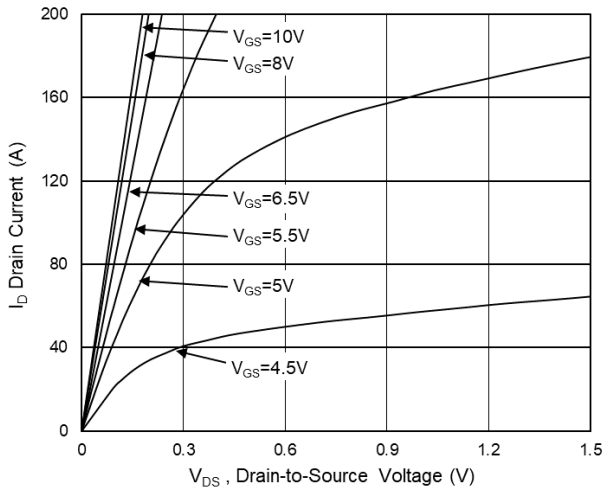


Fig.1 Typical Output Characteristics

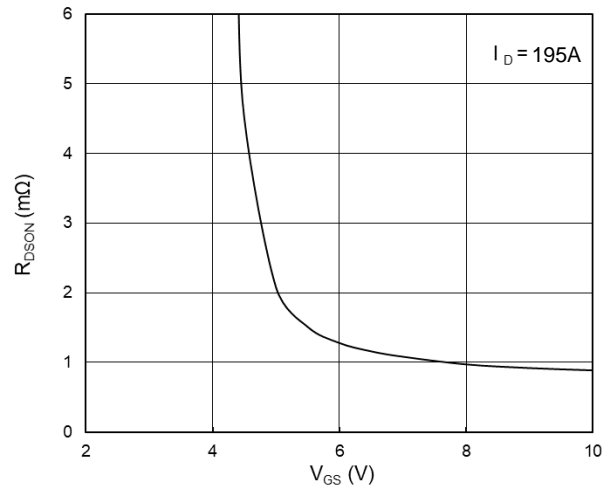


Fig.2 On-Resistance vs G-S Voltage

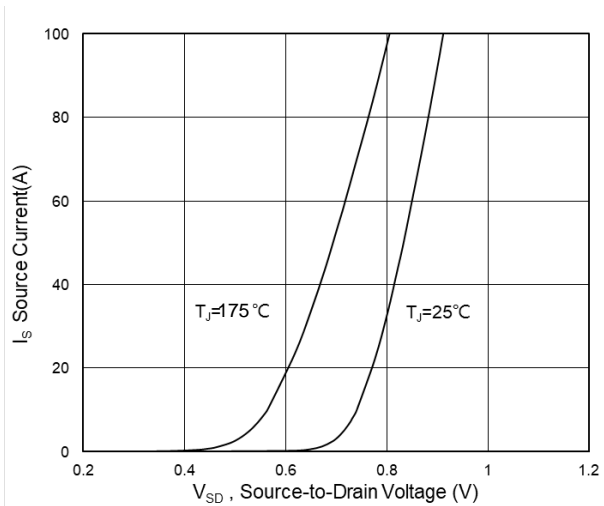


Fig.3 Source Drain Forward Characteristics

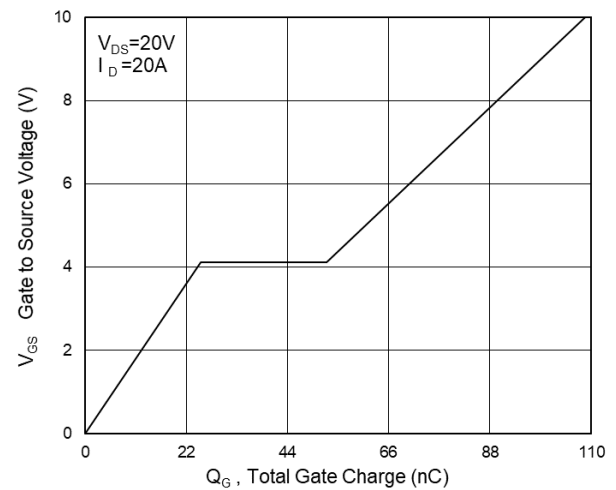


Fig.4 Gate-Charge Characteristics

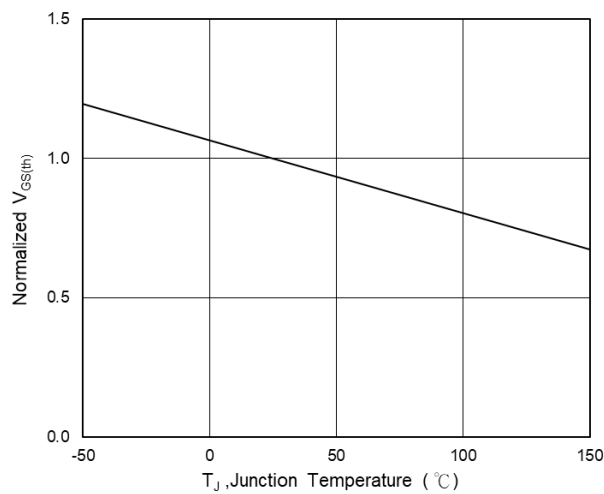


Fig.5 Normalized  $V_{GS(th)}$  vs  $T_J$

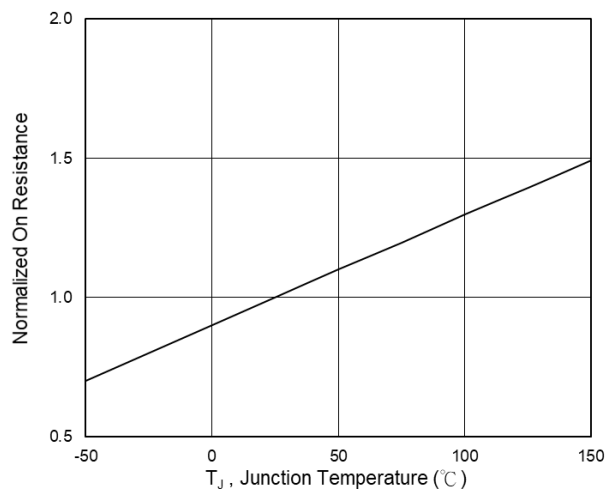
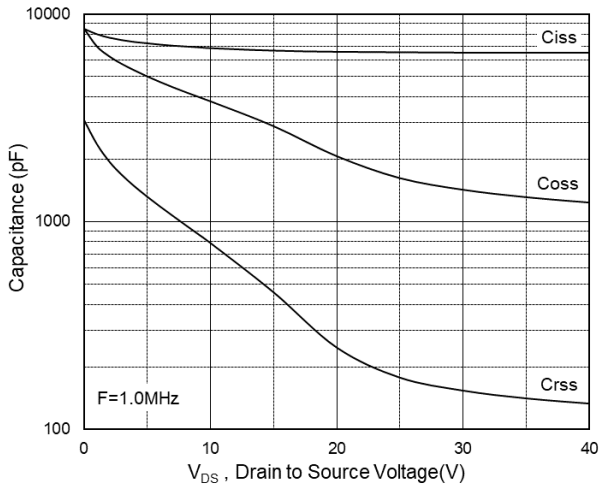
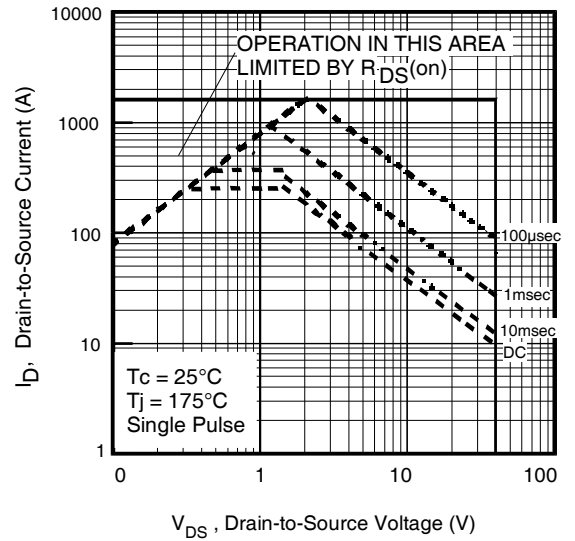


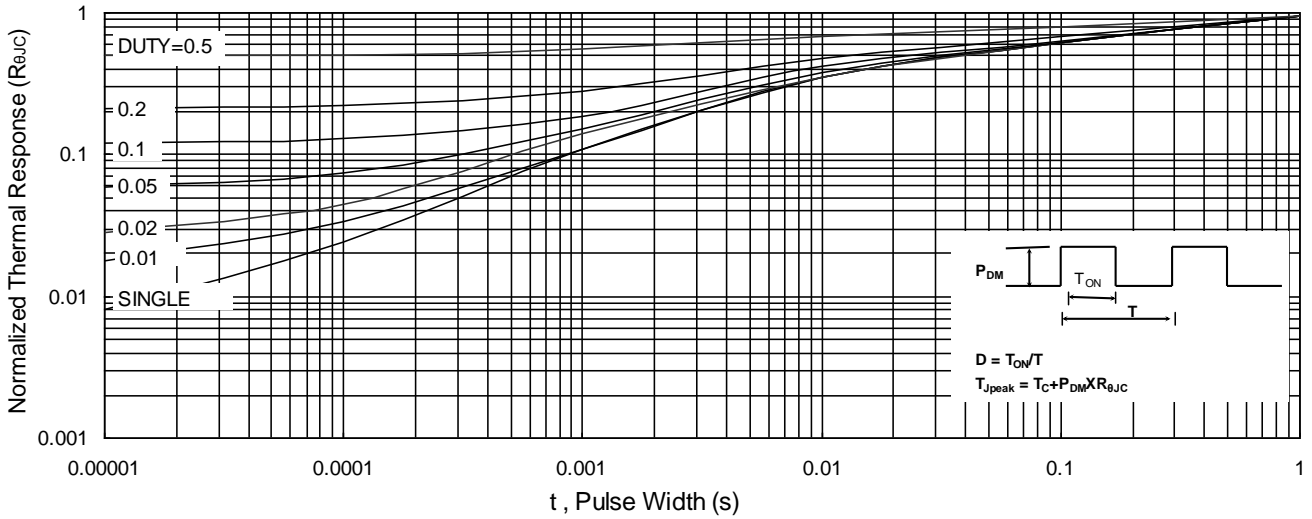
Fig.6 Normalized  $R_{DS(on)}$  vs  $T_J$



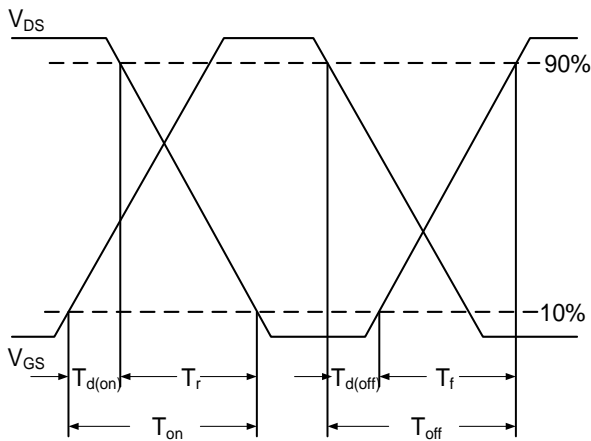
**Fig.7 Capacitance**



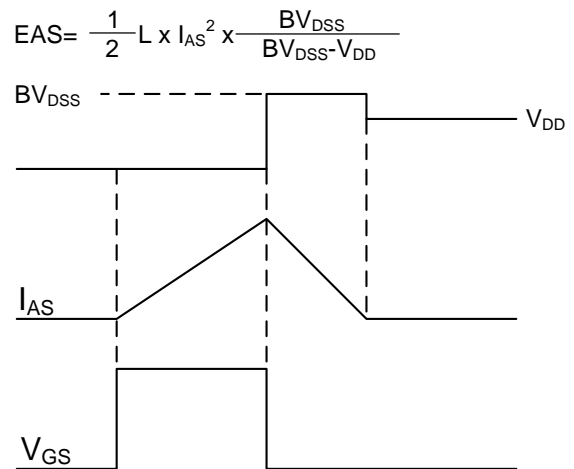
**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**

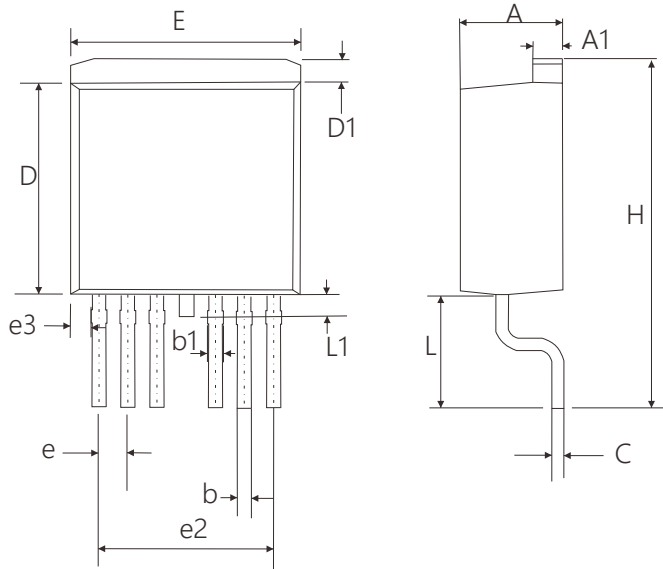


**Fig.10 Switching Time Waveform**



**Fig.11 Unclamped Inductive Switching Waveform**

# TO-263-7L Outline



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.25	4.75	0.167	0.187
A1	1.2	1.4	0.047	0.055
b	0.5	0.7	0.020	0.028
b1	0.5	0.9	0.020	0.035
C	0.4	0.6	0.016	0.024
D	9.05	9.45	0.356	0.372
D1	0.7	1.3	0.028	0.051
E	9.8	10.2	0.386	0.402
e	1.07	1.47	0.042	0.058
e2	7.32	7.92	0.288	0.312
e3	0.64	1.04	0.025	0.041
H	14.65	15.65	0.577	0.616
L	4.47	5.47	0.176	0.215
L1	0.90	1.50	0.035	0.059

## Friendship Reminder

■ JiNan JingHeng (hereinafter referred to as JH) reserves the right to make changes to this document and its products and specifications at anytime without notice.

济南晶恒（以下简称 JH）保留未经通知，变更本文件和与本文件相关的产品及规格的权利。

■ Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.

使用方应在使用、采购本产品之前获取并确认产品信息和规格书的最新版本。

■ JH makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does JH assume any liability for application assistance or customer product design.

JH 对其产品用于某特定用途的适用性，既不做任何保证、说明或担保，也不承担任何应用协助或使用方设计的法定责任。

■ JH does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.

JH 不保证或承担任何责任，其产品被采购使用于任何非预期或授权的应用，

■ No license is granted by implication or otherwise under any intellectual property rights of JH.

此规格书属于 JH 的知识产权,没有经过我司授权不得抄袭。

■ JH's products are not authorized for use as critical components in life support devices or systems without express written approval of JH.

没有 JH 的书面授权，JH 的产品不能在生命支撑设备或系统里作为关键零件使用。