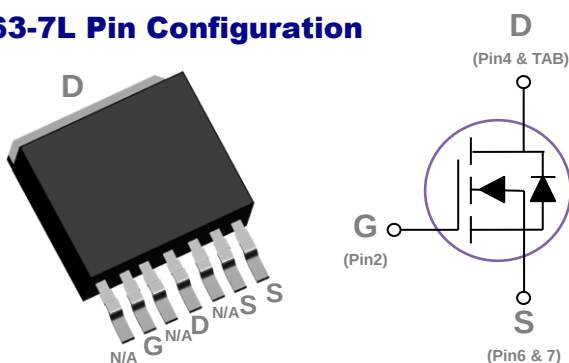


General Description

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

TO263-7L Pin Configuration



BVDSS	RDS(on)	ID
100V	2.9mΩ	150A

Features

- 100V, 150A, $R_{DS(ON)} = 2.9m\Omega$ @ $V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available

Applications

- Networking
- Load Switch
- LED applications
- Quick Charger

Absolute Maximum Ratings $T_c=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current – Continuous ($T_c=25^\circ\text{C}$)	150	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$)	95	A
I_{DM}	Drain Current – Pulsed ¹	600	A
EAS	Single Pulse Avalanche Energy ²	2450	mJ
IAS	Single Pulse Avalanche Current ²	70	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	481	W
	Power Dissipation – Derate above 25°C	3.9	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	0.26	$^\circ\text{C/W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	100	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=80V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=80V$, $V_{GS}=0V$, $T_J=85^\circ\text{C}$	---	---	30	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$, $I_D=30A$	---	2.3	2.9	m Ω
		$V_{GS}=4.5V$, $I_D=20A$	---	7.2	9.5	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1.2	1.8	2.5	V

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{3, 4}	$V_{DS}=50V$, $V_{GS}=10V$, $I_D=80A$	---	205	310	nC
			---	104	160	
Q_{gs}	Gate-Source Charge ^{3, 4}	$V_{DS}=50V$, $V_{GS}=4.5V$, $I_D=80A$	---	27	40	
Q_{gd}	Gate-Drain Charge ^{3, 4}		---	34	50	
$T_{d(on)}$	Turn-On Delay Time ^{3, 4}	$V_{DD}=50V$, $V_{GS}=10V$, $R_G=6\Omega$ $I_D=80A$	---	70	110	ns
T_r	Rise Time ^{3, 4}		---	30	45	
$T_{d(off)}$	Turn-Off Delay Time ^{3, 4}		---	160	240	
T_f	Fall Time ^{3, 4}		---	50	75	
C_{iss}	Input Capacitance	$V_{DS}=50V$, $V_{GS}=0V$, $F=1\text{MHz}$	---	14800	22000	pF
C_{oss}	Output Capacitance		---	2200	3300	
C_{rss}	Reverse Transfer Capacitance		---	40	60	
R_g	Gate resistance	$V_{GS}=0V$, $V_{DS}=0V$, $F=1\text{MHz}$	---	1	2	Ω

Guaranteed Avalanche Energy

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
EAS	Single Pulse Avalanche Energy	$V_{DD}=50V$, $L=1\text{mH}$, $I_{AS}=53A$	1404	---	---	mJ

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	150	A
I_{SM}	Pulsed Source Current		---	---	300	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=1A$, $T_J=25^\circ\text{C}$	---	---	1	V
t_{rr}	Reverse Recovery Time	$V_R=50V$, $I_S=10A$	---	120	---	ns
Q_{rr}	Reverse Recovery Charge	$di/dt=100A/\mu s$, $T_J=25^\circ\text{C}$	---	480	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=50V$, $V_{GS}=10V$, $L=1\text{mH}$, $I_{AS}=70A$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$.
3. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

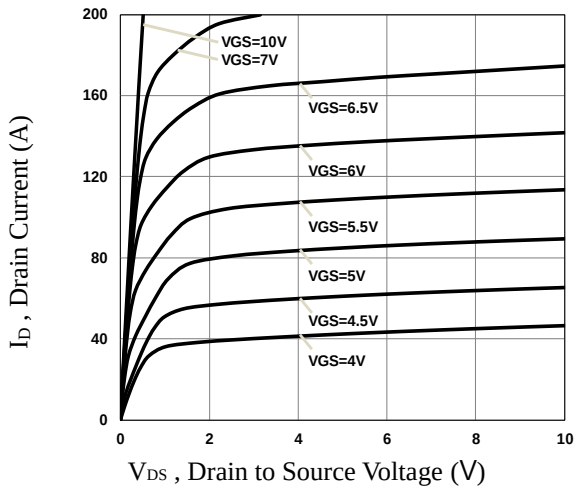


Fig.1 Typical Output Characteristics

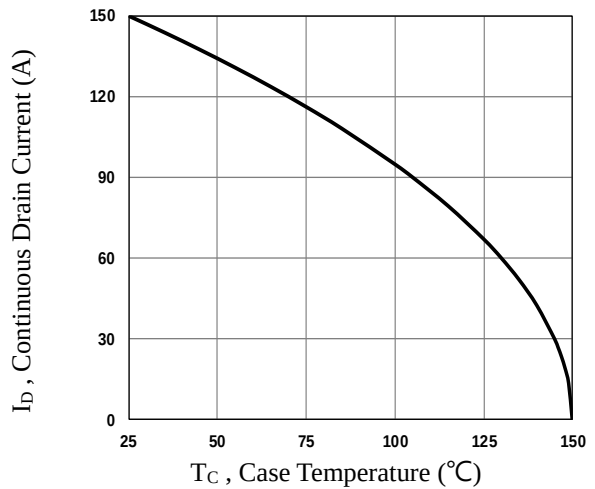


Fig.2 Continuous Drain Current vs. T_C

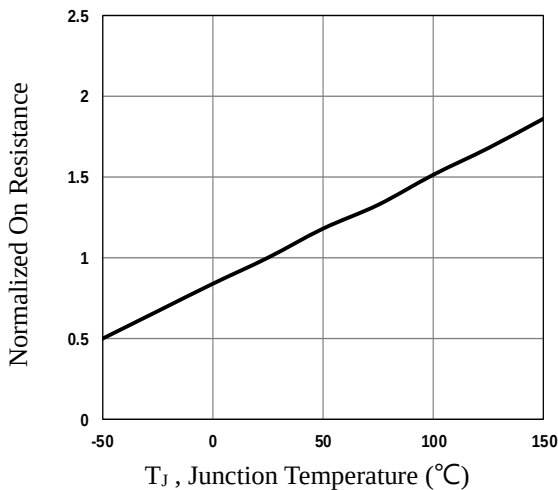


Fig.3 Normalized $R_{DS(on)}$ vs. T_J

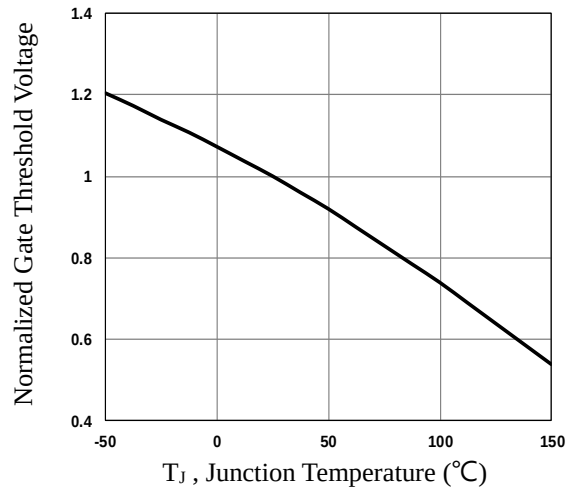


Fig.4 Normalized V_{th} vs. T_J

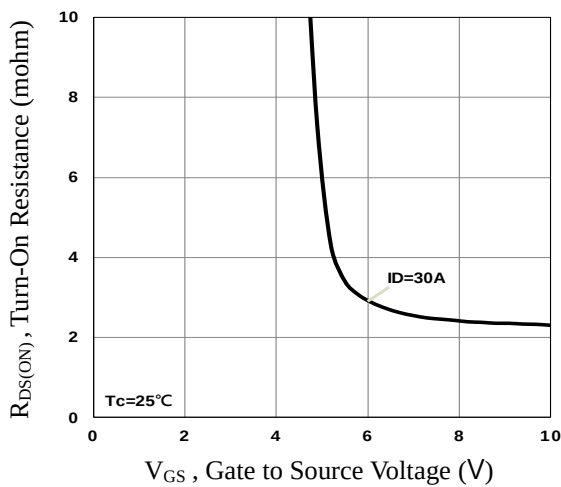


Fig.5 Turn-On Resistance vs. V_{GS}

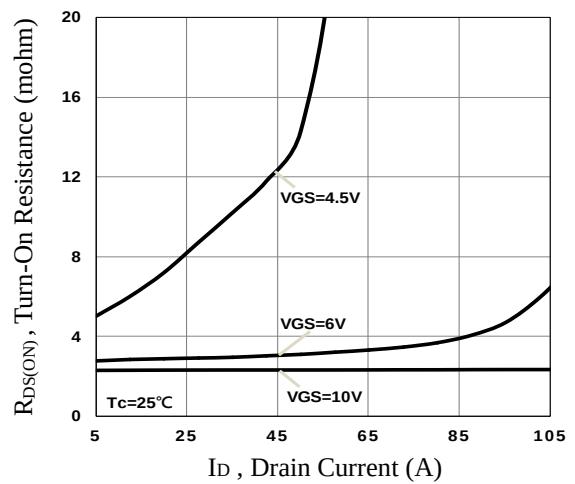


Fig.6 Turn-On Resistance vs. I_D

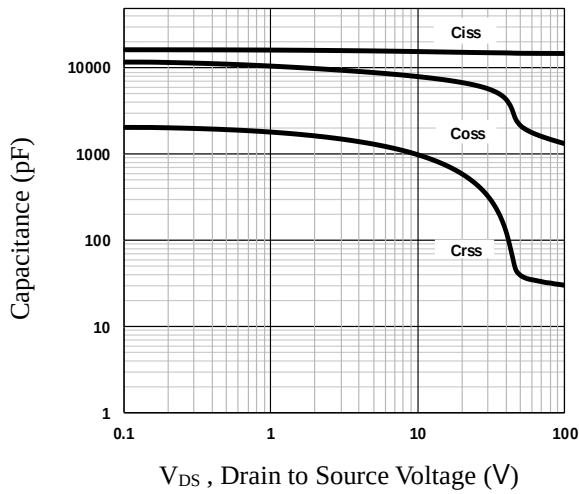


Fig.7 Capacitance Characteristics

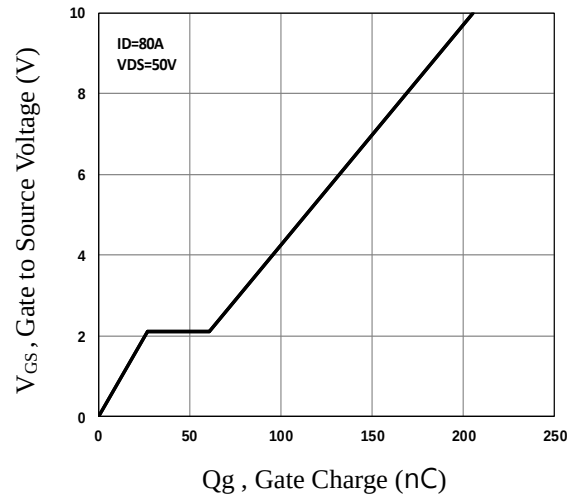


Fig.8 Gate Charge Characteristics

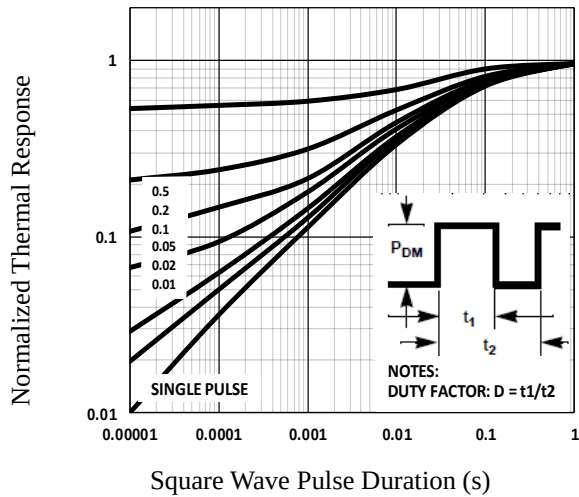


Fig.9 Normalized Transient Impedance

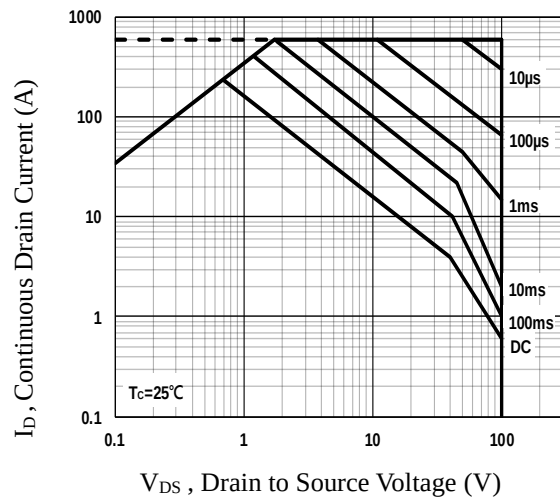


Fig.10 Maximum Safe Operation Area

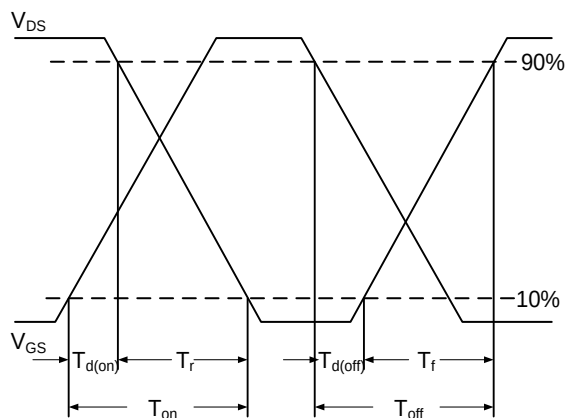


Fig.11 Switching Time Waveform

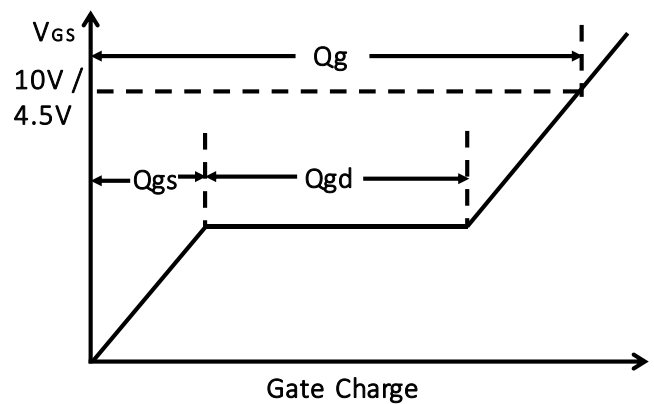
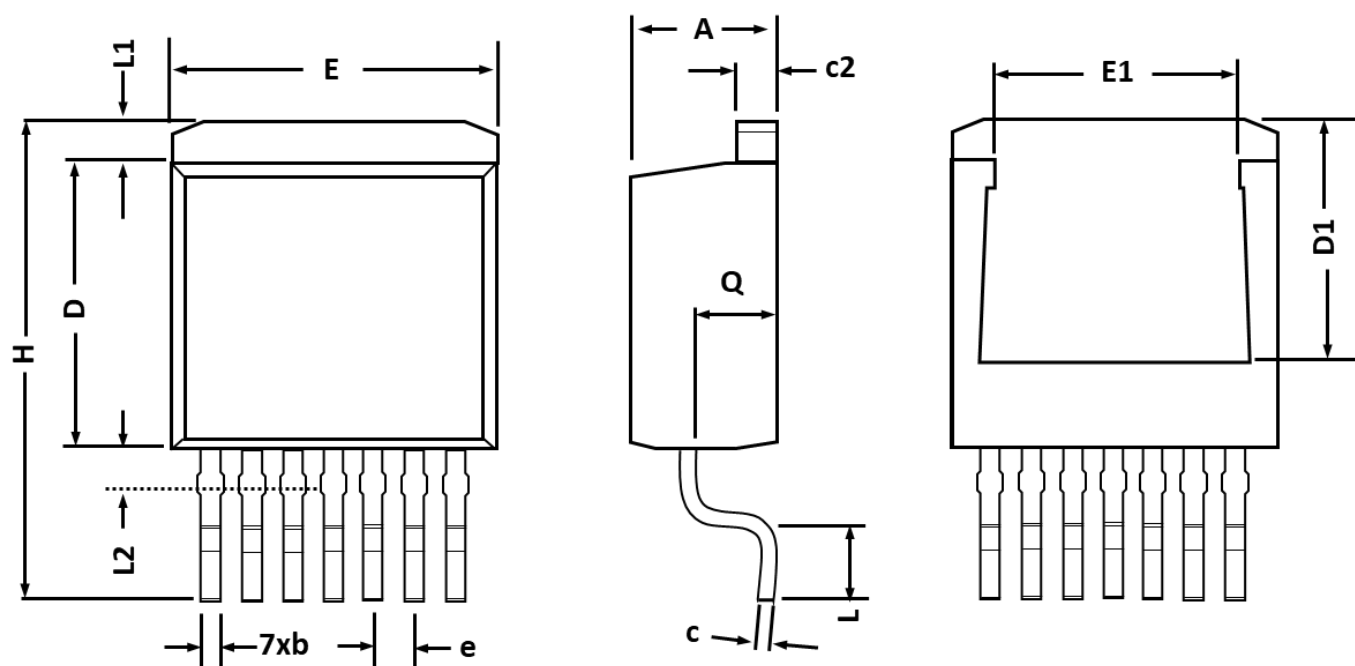


Fig.12 Gate Charge Waveform

TO263-7L PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Max	Min	Max	Min
A	4.650	4.200	0.183	0.165
b	0.700	0.500	0.028	0.020
c	0.600	0.400	0.024	0.016
c2	1.400	1.150	0.055	0.045
D	9.050	8.800	0.356	0.346
D1	---	6.850	---	0.270
E	10.400	9.950	0.409	0.392
E1	7.900	6.85	0.311	0.269
e	1.270 BSC		0.050 BSC	
H	15.900	14.600	0.626	0.575
L	2.800	1.750	0.110	0.069
L1	1.360 REF.		0.054 REF.	
L2	1.200 REF.		0.047 REF.	
Q	2.700	2.300	0.106	0.091