

General Description

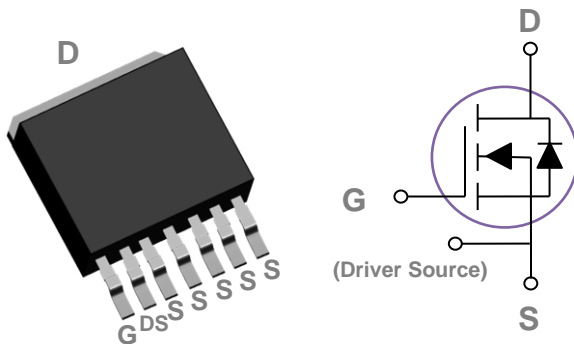
These N-Channel enhancement mode power field effect transistors are using silicon carbide technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BVDSS	R _{DS(ON)(typ)}	ID
1200V	30mΩ	57A

Features

- 1200V,57A, R_{DS(ON)(typ)} =30mΩ @V_{GS} = 18V
- Improved dv/dt capability
- Fast switching
- Green Device Available

TO263-7L Pin Configuration



Applications

- SMPS
- Solar Inverters
- Renewable energy
- EV battery chargers

Absolute Maximum Ratings T_c=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	1200	V
V _{GS}	Gate-Source Voltage	+22/-10	V
I _D	Drain Current – Continuous (T _c =25°C)	57	A
	Drain Current – Continuous (T _c =100°C)	40	A
I _{DM}	Drain Current – Pulsed ¹	142	A
P _D	Power Dissipation (T _c =25°C)	272	W
	Power Dissipation – Derate above 25°C	1.81	W/°C
T _{STG}	Storage Temperature Range	-55 to 175	°C
T _J	Operating Junction Temperature Range	-55 to 175	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJC}	Thermal Resistance Junction to Case	0.55	---	°C/W

Electrical Characteristics (T_J=25 °C, unless otherwise noted)
Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =100μA	1200	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =1200V , V _{GS} =0V , T _J =25°C	---	---	10	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =22V , V _{DS} =0V	---	---	100	nA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =18V , I _D =40A	---	30	39	mΩ
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =15V , I _D =40A	---	40	---	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =4mA	1.7	2.3	2.8	V

Dynamic and switching Characteristics

Q _g	Total Gate Charge	V _{DS} =800V , V _{GS} =-5/18V , I _{DS} =40A	---	115	---	nC
Q _{gs}	Gate-Source Charge		---	24	---	
Q _{gd}	Gate-Drain Charge		---	25	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =800V , V _{GS} =-5/18V , R _G =6Ω , I _{DS} =40A	---	25	---	ns
T _r	Rise Time		---	15	---	
T _{d(off)}	Turn-Off Delay Time		---	40	---	
T _f	Fall Time		---	15	---	
C _{iss}	Input Capacitance	V _{DS} =1000V , V _{GS} =0V , F=500kHz , V _{AC} =25mV	---	2600	---	pF
C _{oss}	Output Capacitance		---	135	---	
C _{rss}	Reverse Transfer Capacitance		---	6	---	
R _g	Gate resistance	V _{GS} =0V , V _{DS} =0V , F=1MHz	---	2.5	---	Ω

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	---	---	57	A
V _{SD}	Diode Forward Voltage	V _{GS} =-5V , I _S =40A , T _J =25°C	---	4.1	---	V
t _{rr}	Reverse Recovery Time	V _R =400V , I _S =40A	---	50	---	ns
Q _{rr}	Reverse Recovery Charge	di/dt=300A/μs , T _J =25°C	---	130	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300μs , duty cycle ≤ 2%.

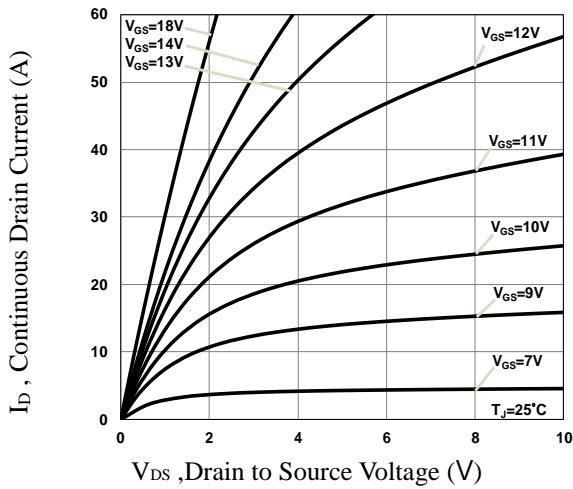


Fig.1 Typical Output Characteristics

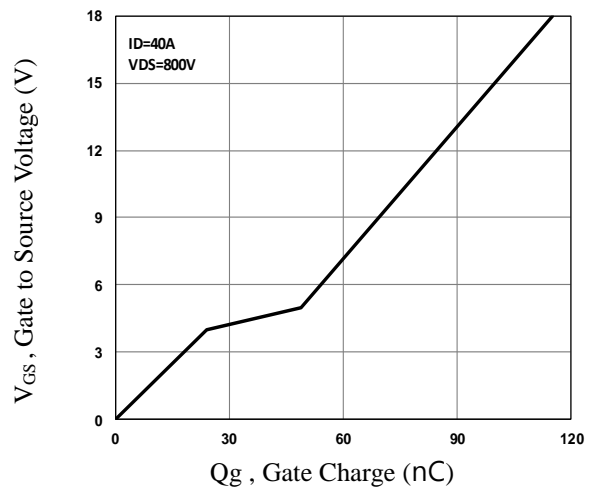


Fig.2 Gate Charge Characteristics

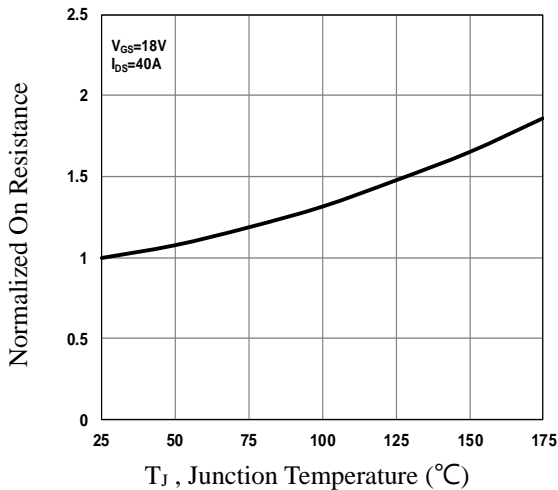


Fig.3 Normalized RDS(on) vs. TJ

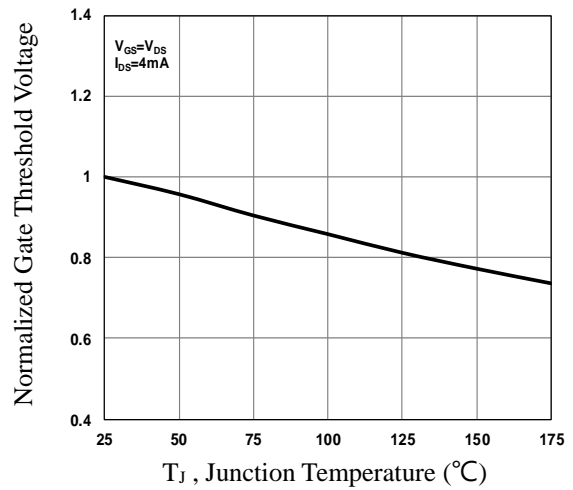


Fig.4 Normalized Vth vs. TJ

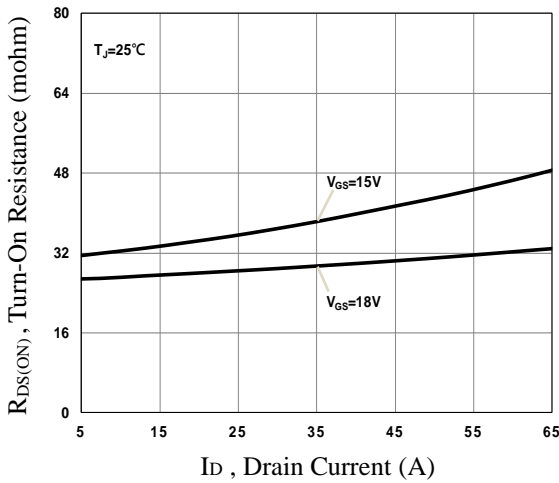


Fig.5 Turn-On Resistance vs. ID

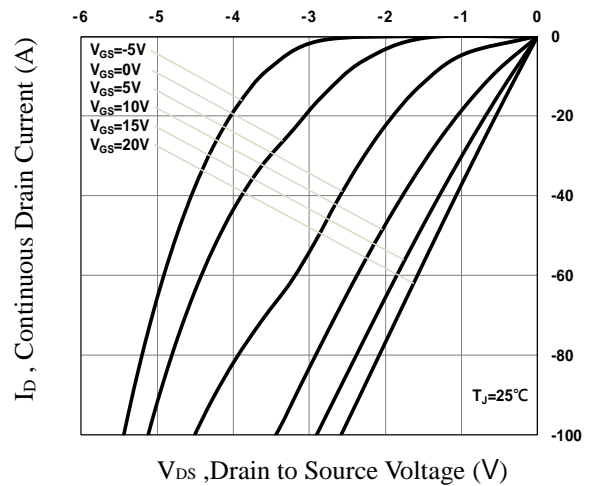


Fig.6 3rd Quadrant Characteristic

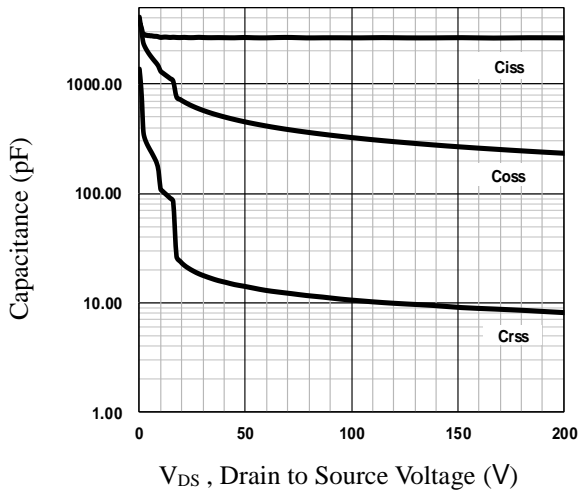


Fig.7 Capacitance Characteristics

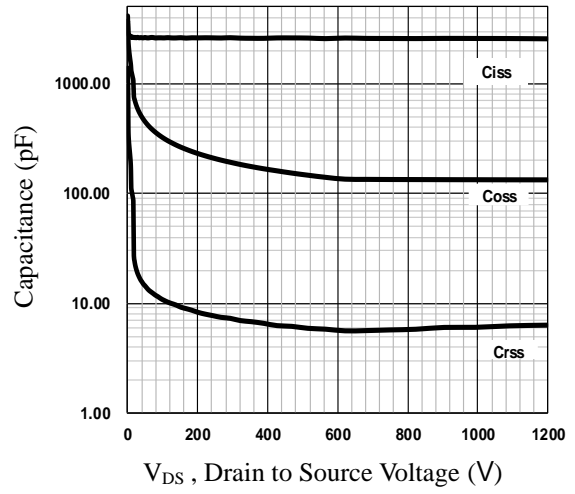


Fig.8 Capacitance Characteristics

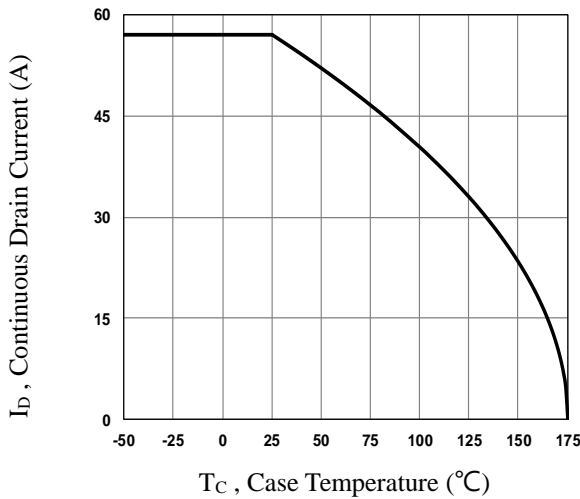


Fig.9 Continuous Drain Current vs. T_c

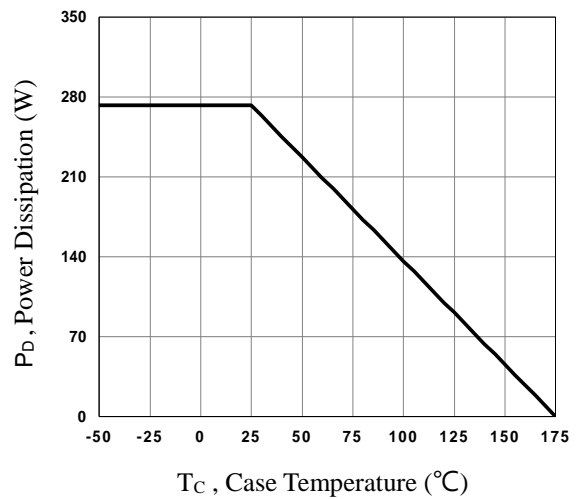
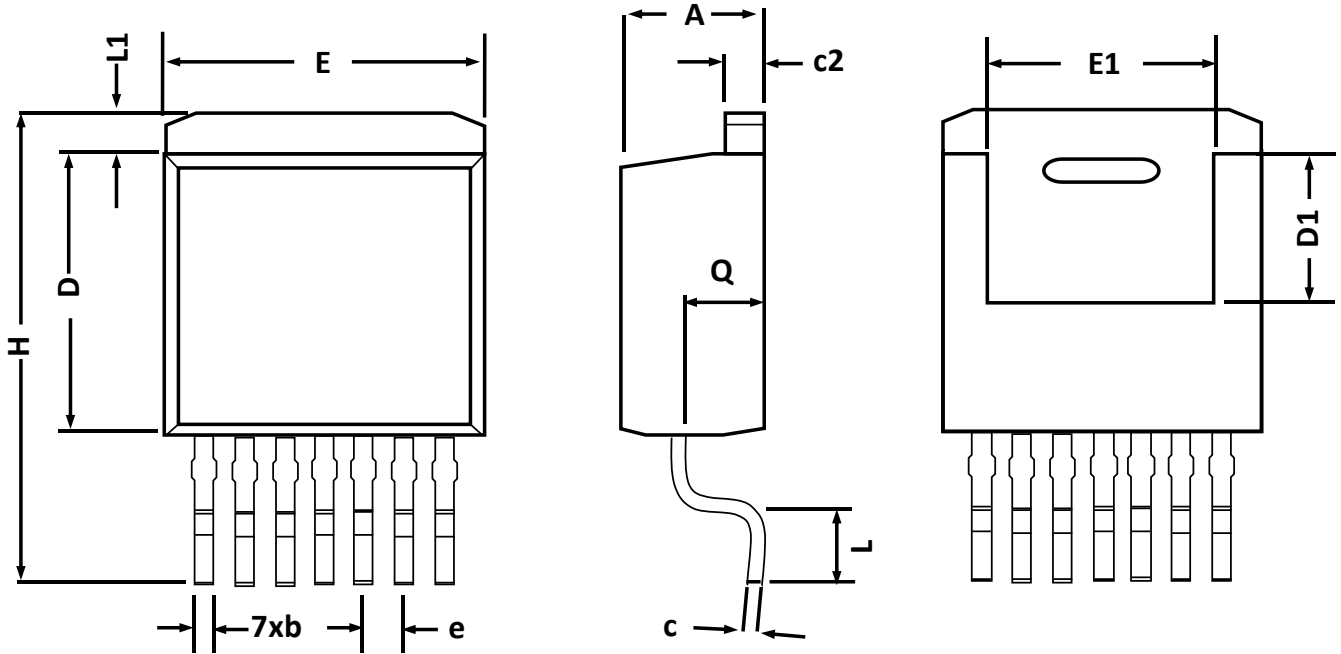


Fig.10 Power Dissipation Derating vs. T_c

TO263-7L PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Max	Min	Max	Min
A	4.500	4.300	0.177	0.169
b	0.700	0.500	0.028	0.020
c	0.600	0.450	0.024	0.018
c2	1.400	1.200	0.055	0.047
D	9.230	8.930	0.363	0.352
D1	4.950	4.650	0.195	0.183
E	10.28	10.08	0.405	0.397
E1	7.620	6.820	0.300	0.269
e	1.270 BSC		0.050 BSC	
H	16.00	15.00	0.630	0.591
L	2.500	1.900	0.098	0.075
L1	1.400	1.000	0.055	0.039
Q	2.750	2.450	0.108	0.096