

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D@25^{\circ}C$
650V	36mΩ@10V	70A

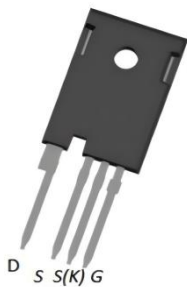
Feature

- New technology for high voltage device
- Ultra low on-resistance and ultra low conduction losses
- Ultra Low Gate Charge cause lower driving requirements
- Diode reverse recovery speed is super fast
- High reliability

Application

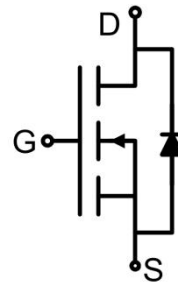
- Power factor correction (PFC)
- Switched mode power supplies (SMPS)
- Uninterruptible Power Supply (UPS)
- On-board charger (OBC)

Package

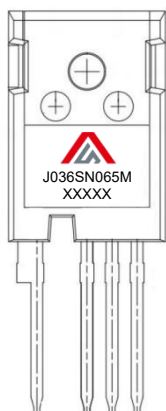


TO-247-4L

Circuit diagram



Marking



Absolute maximum ratings (T_C=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage (V _{GS} =0V)	V _{DS}	650	V
Gate-Source Voltage (V _{DS} =0V) AC (f>1 Hz)	V _{GS}	±30	V
Gate-Source Voltage (V _{DS} =0V) DC	V _{GS}	±20	V
Continuous Drain Current	I _D	70	A
Continuous Drain Current (T _C =100°C)	I _D (100°C)	49	A
Pulsed Drain Current ¹⁾	I _{DM}	210	A
Single Pulse Avalanche Energy ²⁾	E _{AS}	784	mJ
Power Dissipation	P _D	488	W
Thermal Resistance Junction to Case	R _{θJC}	0.31	°C/W
Operating Junction Temperature	T _J	-55 ~ +175	°C
Storage Temperature	T _{STG}	-55 ~ +175	°C

Electrical characteristics (T_A=25°C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =1mA	650			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =650V, V _{GS} =0V, T _C =25°C			10	μA
Gate-Source leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±200	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =3mA	3.5	4.2	5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =35A		30	36	mΩ
Dynamic characteristics ³⁾						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f =1MHz		7727		pF
Output Capacitance	C _{oss}			263		
Reverse Transfer Capacitance	C _{rss}			25.1		
Total Gate Charge	Q _g	V _{DS} =400V, V _{GS} =10V, I _D =40A		125		nC
Gate-Source Charge	Q _{gs}			57		
Gate-Drain Charge	Q _{gd}			34		
Turn-on delay time	t _{d(on)}	V _{DS} =380V, V _{GS} =10V, I _D =40A R _G =4Ω		54		nS
Turn-on rise time	t _r			37		
Turn-off delay time	t _{d(off)}			127		
Turn-off fall time	t _f			5		
Source-Drain Diode characteristics						
Diode Forward Current	I _S	T _C =25°C			70	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _{SD} =70A, T _J =25°C			1.2	V
Reverse Recovery Time	T _{rr}	I _F =40A, di/dt =100A/μs T _J =25°C		185		nS
Reverse Recovery Charge	Q _{rr}			1.6		uC
Peak Reverse Recovery Current	I _{rrm}			16		A

Notes:

- 1) Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2) T_J=25°C, V_{DD}=50V, V_G=10V, R_G=25Ω.
- 3) Guaranteed by design, not subject to production testing.

Typical Characteristics

Figure1. Safe operating area

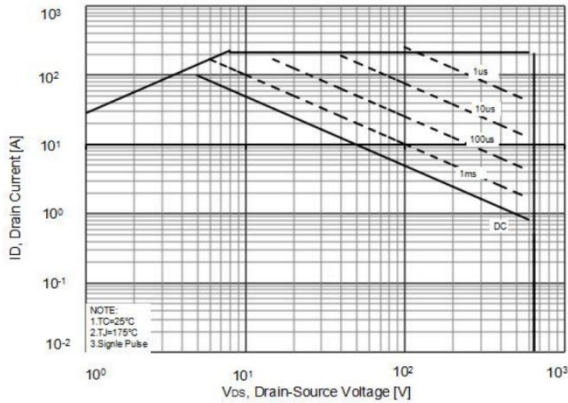


Figure2. Source-Drain Diode Forward Voltage

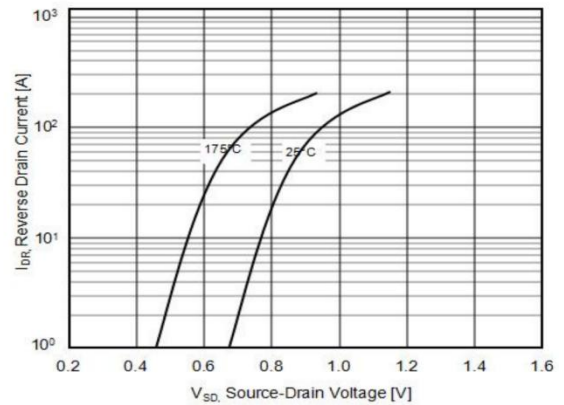


Figure3. Output characteristics (25°C)

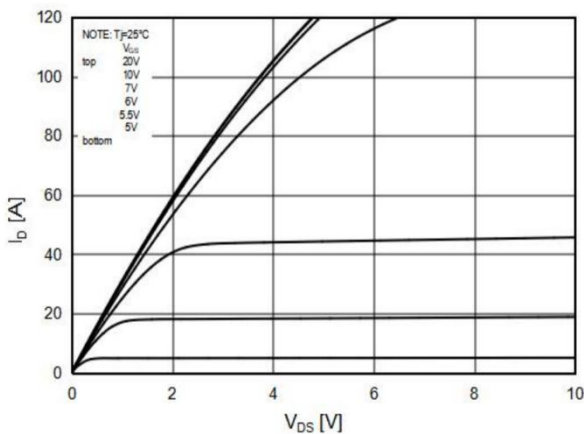


Figure4. Transfer characteristics

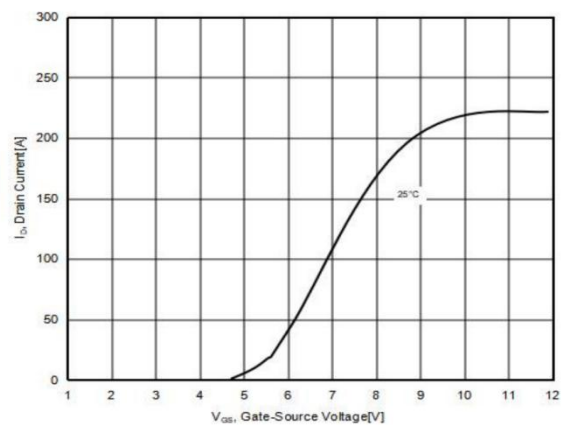


Figure5. Static drain-source on resistance

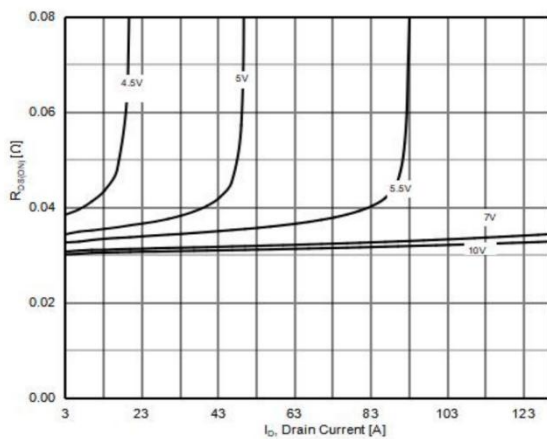
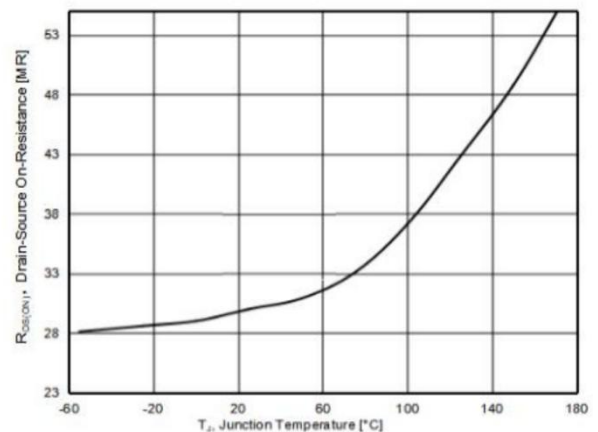


Figure6. $R_{DS(ON)}$ vs Junction Temperature



Typical Characteristics

Figure7. BV_{DS} vs Junction Temperature

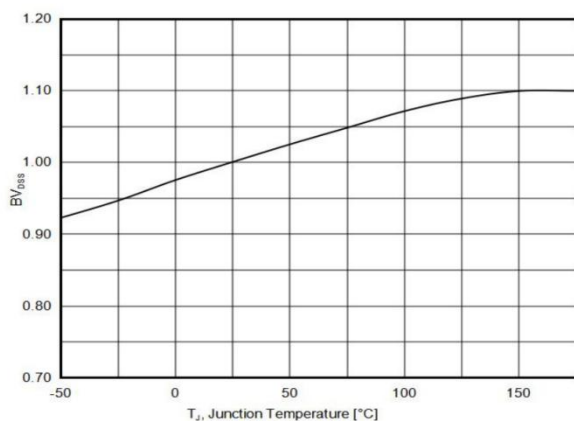


Figure8. Maximum I_D vs Junction Temperature

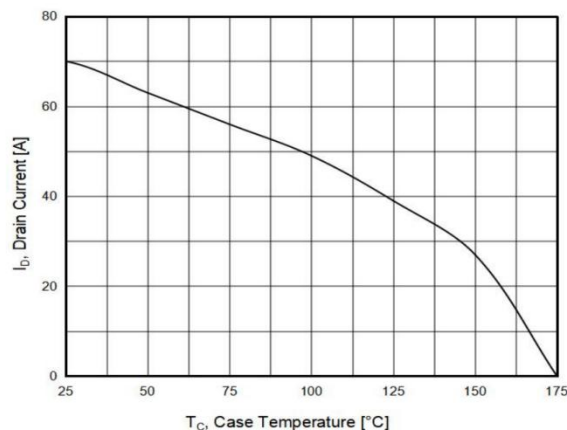


Figure9. Gate charge waveforms

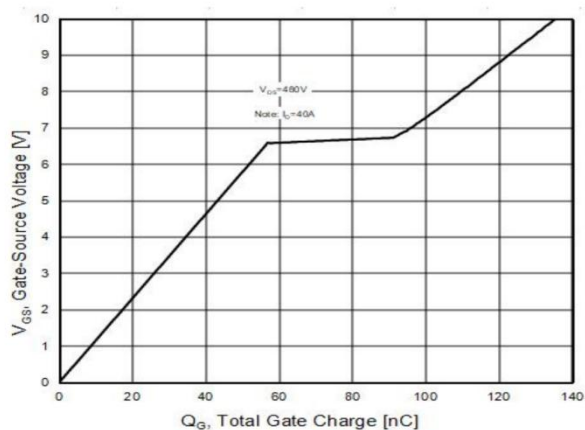


Figure10. Capacitance

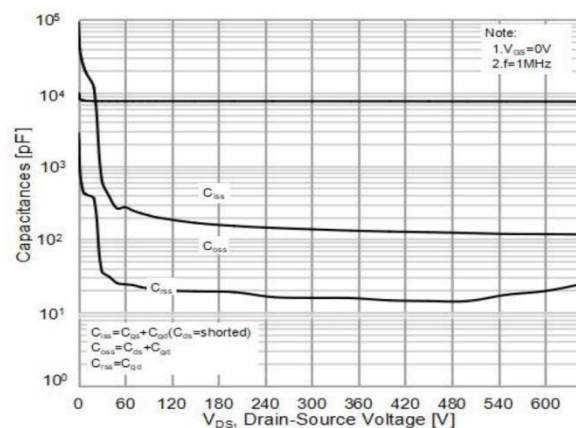
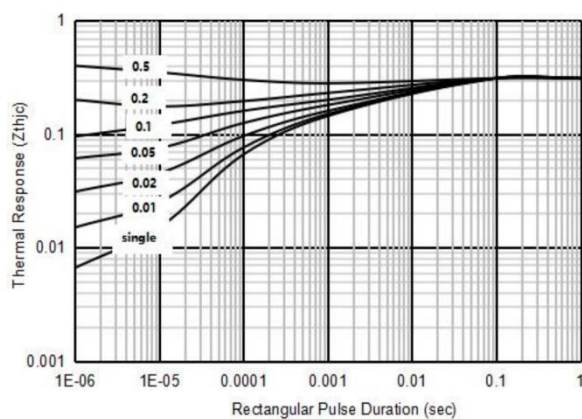
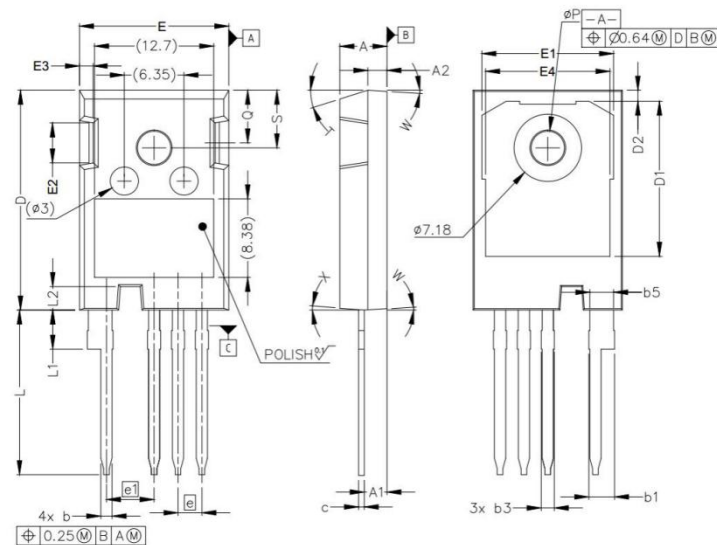


Figure11. Transient Thermal Impedance



TO-247-4L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.830	5.210	0.190	0.205
A1	2.290	2.540	0.090	0.100
A2	1.910	2.160	0.075	0.085
b	1.070	1.330	0.042	0.052
b1	2.390	2.940	0.094	0.116
b3	1.070	1.600	0.042	0.063
b5	2.390	2.690	0.094	0.106
c	0.550	0.680	0.022	0.027
D	23.300	23.600	0.917	0.929
D1	16.250	17.650	0.640	0.695
D2	0.950	1.250	0.037	0.049
E	15.750	16.130	0.620	0.635
E1	13.100	14.150	0.516	0.557
E2	3.680	5.100	0.145	0.201
E3	1.000	1.900	0.039	0.075
E4	12.380	13.430	0.487	0.529
e	2.540 BSC.		0.100 BSC.	
e1	5.080 BSC.		0.200 BSC.	
L	17.310	17.820	0.681	0.702
L1	3.970	4.370	0.156	0.172
L2	2.350	2.650	0.093	0.104
ΦP	3.510	3.650	0.138	0.144
Q	5.490	6.000	0.216	0.236
S	6.040	6.300	0.238	0.248
T	17.5° REF.		17.5° REF.	
W	3.5° REF.		3.5° REF.	
X	4.0° REF.		4.0° REF.	