

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
600V	70mΩ@10V	48A

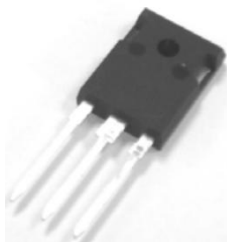
Feature

- Low on-resistance
- Low gate charge

Application

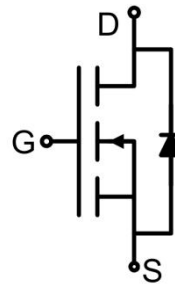
- Power factor correction (PFC)
- Uninterruptible Power Supply (UPS)

Package



TO-247AB

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}	600	V
Gate-Source Voltage	V _{GS}	±30	V
Continuous Drain Current	I _D	48	A
Pulsed Drain Current ¹⁾	I _{DM}	150	A
Single Pulse Avalanche Energy ²⁾	E _{AS}	550	mJ
Power Dissipation ³⁾	P _D	500	W
Thermal Resistance Junction to Case	R _{θJC}	0.25	°C/W
Operating Junction Temperature	T _J	-55 ~ +150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Electrical characteristics (T_J=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	600			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =600V, V _{GS} =0V			10	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±30V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =1mA	3	4	5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =23.5A		62	70	mΩ
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f =250kHz		3750		pF
Output Capacitance	C _{oss}			110		
Reverse Transfer Capacitance	C _{rss}			4		
Total Gate Charge	Q _g	V _{DS} =400V, V _{GS} =10V, I _D =23A		70		nC
Gate-Source Charge	Q _{gs}			20		
Gate-Drain Charge	Q _{gd}			16		
Turn-on delay time	t _{d(on)}	V _{DS} =400V, V _{GS} =10V, I _D =23A		87		nS
Turn-on rise time	t _r			66		
Turn-off delay time	t _{d(off)}			125		
Turn-off fall time	t _f			72		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				48	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =23A			0.88	V
Reverse Recovery Time	T _{rr}	V _R =100V, I _S =23A di/dt =-100A/μs		147		nS
Reverse Recovery Charge	Q _{rr}			1.32		uC
Peak reverse recovery current	I _{rrm}			17		A

Notes:

- 1) The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2) The EAS data shows Max. rating . L=0.5mH, I_{AS} =7A, V_{DD} =50V, R_θ=25Ω.
- 3) The power dissipation is limited by 150°C junction temperature.
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

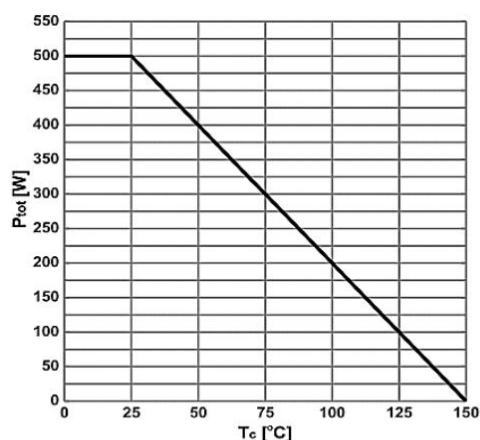


Figure1: Power dissipation (Non FullPAK)

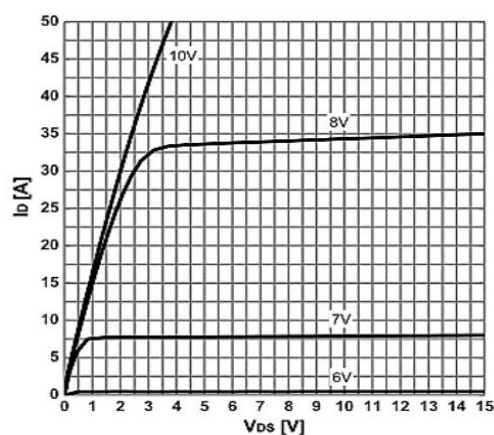


Figure2: output characteristics

$I_D = f(V_{DS})$; $T_J = 25^\circ\text{C}$; parameter: VGS

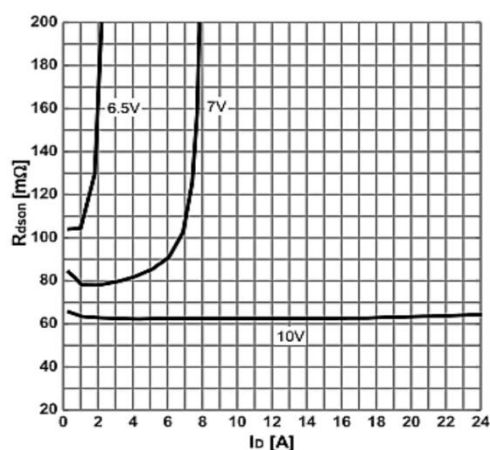


Figure3: Typ. drain-source on-state resistance

$R_{DS(on)} = f(I_D)$; $T_J = 25^\circ\text{C}$; parameter: VGS

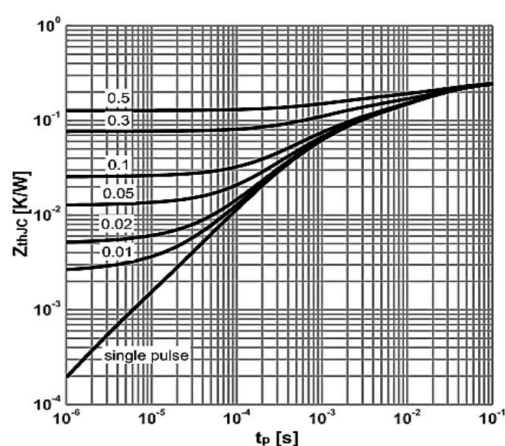


Figure4:Max. transient thermal impedance

$P_{tot} = f(T_C)$

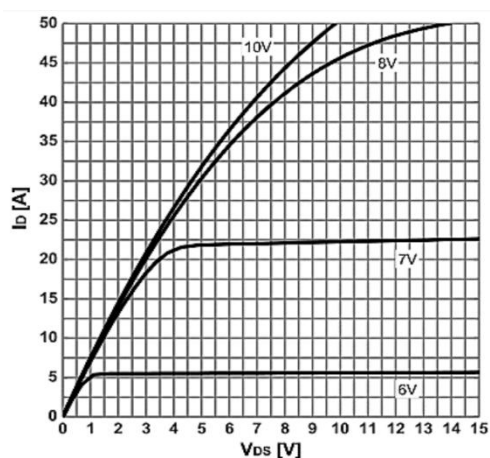


Figure5: Type. output characteristics

$I_D = f(V_{DS})$; $T_J = 125^\circ\text{C}$; parameter: VGS

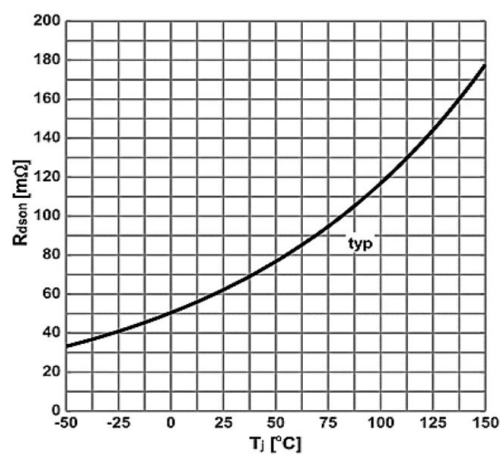


Figure6: Max. transient thermal impedance

$R_{DS(on)} = f(T_J)$; $I_D = 23.5\text{A}$; VGS = 10V

Typical Characteristics

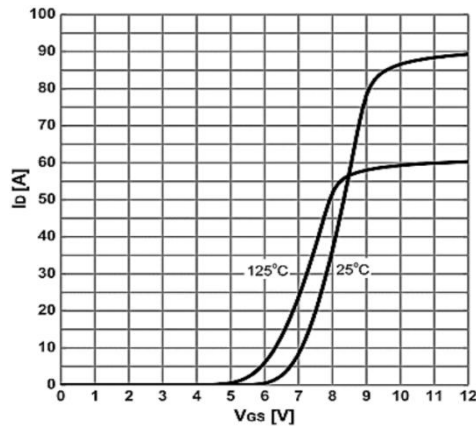


Figure 7: Typ. transfer characteristics
 $I_D = f(V_{GS})$; $V_{DS} = 20V$; parameter: T_J

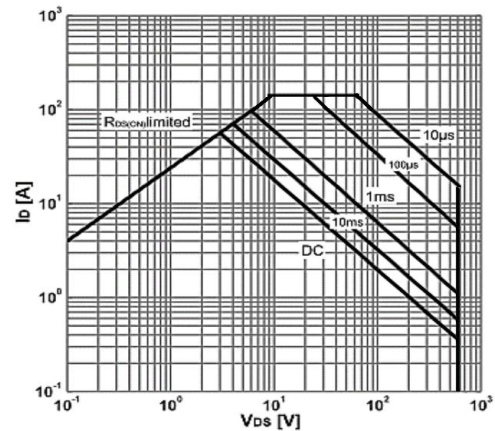


Figure 8: Safe operating area (Non FullPAK)
 $I_D = f(V_{DS})$; $T_J = 25^\circ C$; $D = 0$; parameter: t_p

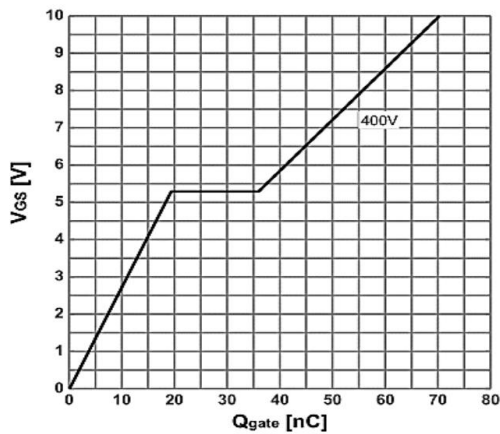


Figure 9: Typ. gate charge
 $V_{GS} = f(Q_{gate})$; $I_D = 25A$ pulsed; $V_{DS} = 400V$

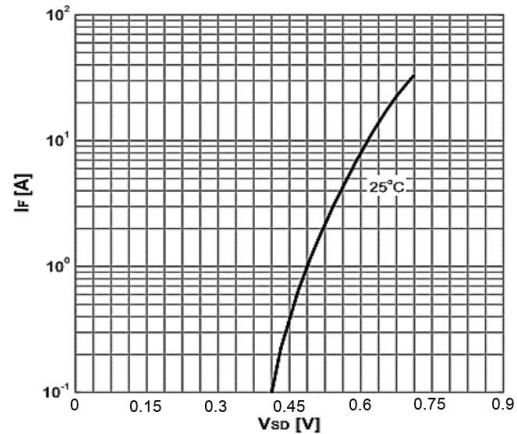


Figure 10: Forward characteristics of reverse diode
 $I_R = f(V_{SD})$; parameter: T_J

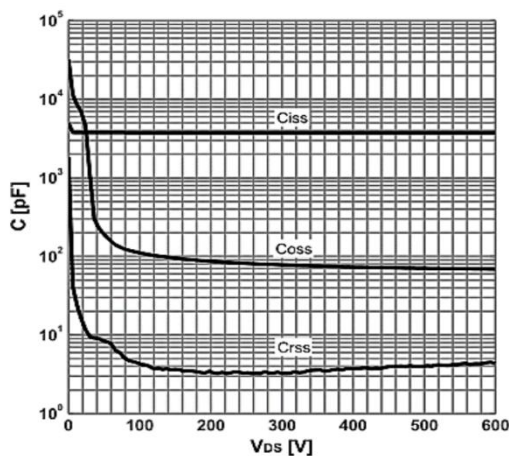


Figure 11: Typ. capacitances
 $C = f(V_{DS})$; $V_{GS} = 0V$; $f = 250kHz$

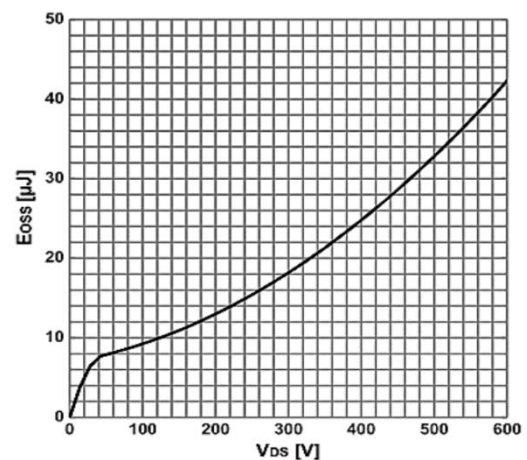
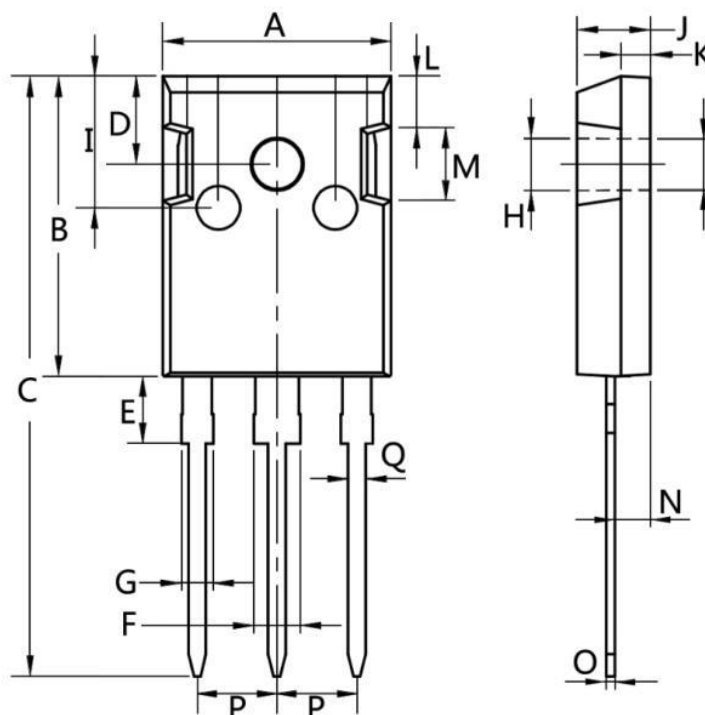


Figure 12: Typ. C_{oss} stored energy
 $E_{OSS} = f(V_{DS})$

TO-247AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	15.000	16.000	0.591	0.630
B	20.000	21.000	0.787	0.827
C	41.000	42.000	1.614	1.654
D	5.000	6.000	0.197	0.236
E	4.000	5.000	0.157	0.197
F	2.500	3.500	0.098	0.138
G	1.750	2.500	0.069	0.098
H	3.000	3.500	0.118	0.138
I	8.000	10.000	0.315	0.394
J	4.900	5.100	0.193	0.201
K	1.900	2.100	0.075	0.083
L	3.500	4.000	0.138	0.157
M	4.750	5.250	0.187	0.207
N	2.000	3.000	0.079	0.118
O	0.550	0.750	0.022	0.030
P	5.080 BSC.		0.200 BSC.	
Q	1.200	1.300	0.047	0.051