

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
300V	16mΩ@10V	125A

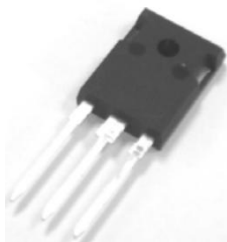
Feature

- Fast switching
- Low gate charge and $R_{DS(ON)}$

Application

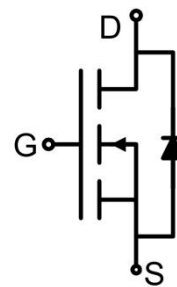
- PWM application
- Hard switched and high frequency circuits
- Power management

Package



TO-247AB

Circuit diagram



Marking



Absolute maximum ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	300	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_c=25^{\circ}\text{C}$)	I_D	125	A
Continuous Drain Current ($T_c=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	83	A
Pulsed Drain Current	I_{DM}	380	A
Single Pulse Avalanche Energy ¹⁾	E_{AS}	1332	mJ
Power Dissipation ($T_c=25^{\circ}\text{C}$)	P_D	500	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.25	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

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

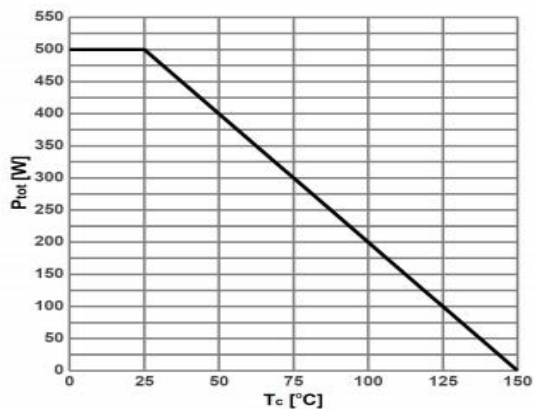
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	300			V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=240V, V_{GS}=0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	3.5	4.5	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=35A$		13	16	m Ω
Dynamic characteristics ²⁾						
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, f=1MHz$		5200		pF
Output Capacitance	C_{oss}			340		
Reverse Transfer Capacitance	C_{rss}			6.5		
Total Gate Charge	Q_g	$V_{DS}=200V, V_{GS}=10V, I_D=40A$		85		nC
Gate-Source Charge	Q_{gs}			26		
Gate-Drain Charge	Q_{gd}			22		
Turn-on delay time	$t_{d(on)}$	$V_{DS}=200V, V_{GS}=10V, I_D=40A$ $R_G=20\Omega$		49		nS
Turn-on rise time	t_r			32		
Turn-off delay time	$t_{d(off)}$			82		
Turn-off fall time	t_f			8		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				125	A
Diode Forward voltage	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}C$			1.2	V
Reverse Recovery Time	T_{rr}	$V_R=200V, I_S=40A$		118		nS
Reverse Recovery Charge	Q_{rr}	$di/dt=100A/\mu s$		0.56		μC

Notes:

- 1) The test condition is $V_{DD}=50\text{V}, V_{GS}=10\text{V}, L=0.5\text{mH}, R_G=25\Omega$.
- 2) Guaranteed by design, not subject to production testing.

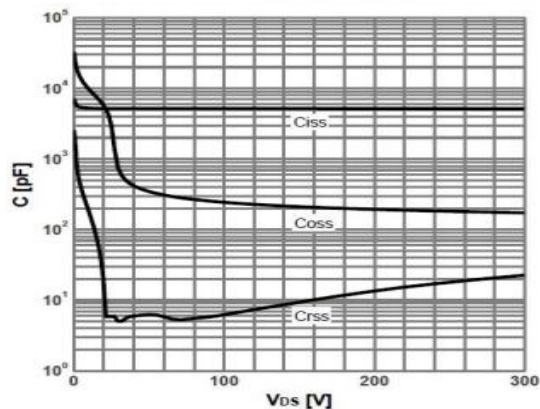
Typical Characteristics

Power dissipation



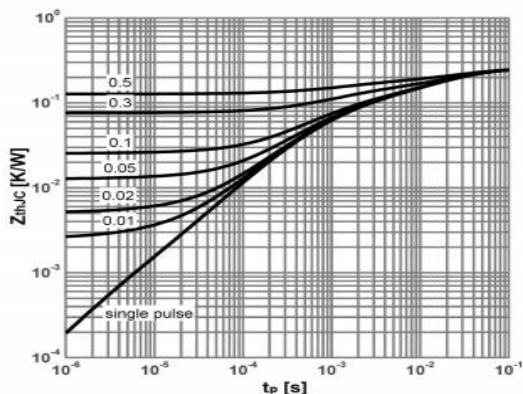
$$P_{tot}=f(T_c)$$

Typ. capacitances



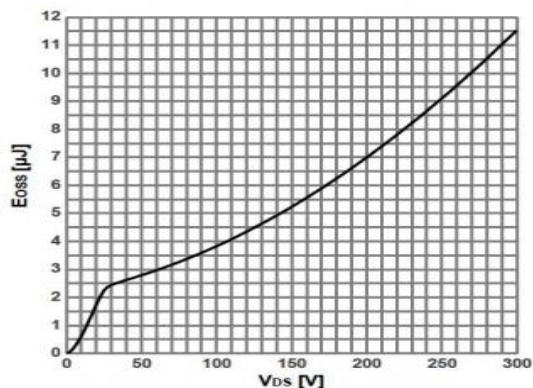
$$C=f(V_{DS}); V_{GS}=0V; f=1MHz$$

Max. transient thermal impedance



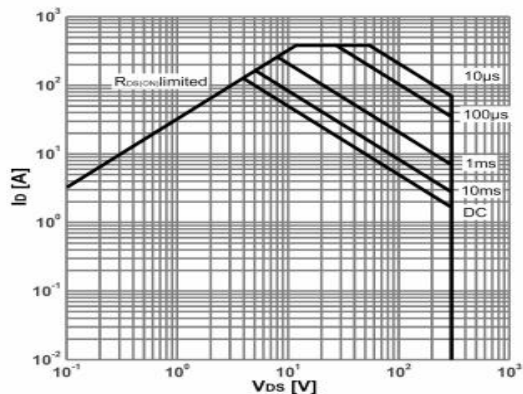
$$Z_{thJC}=f(t_p); \text{ parameter: } D= t_p/T$$

Typ. Coss stored energy



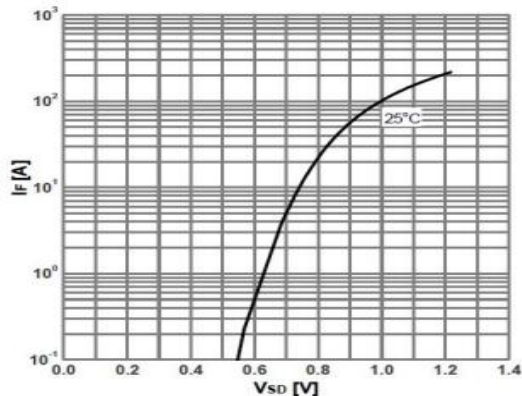
$$E_{OSS}=f(V_{DS})$$

Safe operating area



$$I_D=f(V_{DS}); T_J=25^{\circ}C; D=0; \text{ parameter: } t_p$$

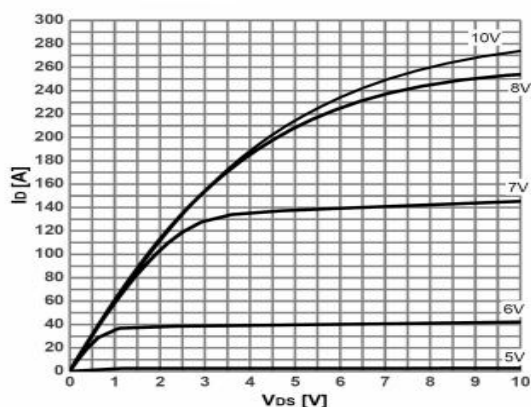
Forward characteristics of reverse diode



$$I_F=f(V_{SD}); \text{ parameter: } T_J$$

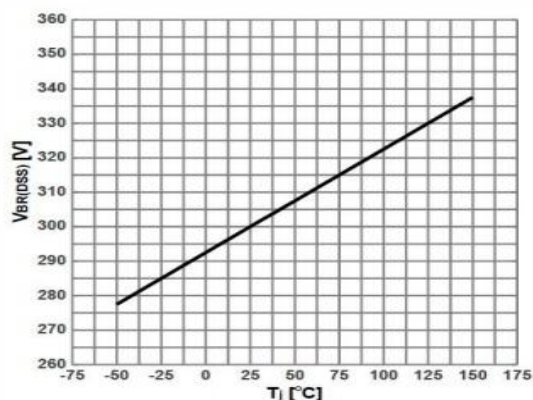
Typical Characteristics

Typ. output characteristics



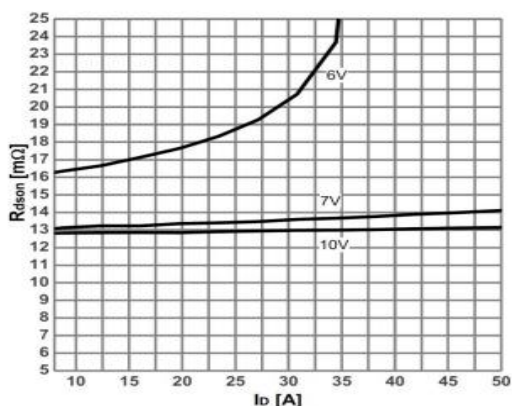
$I_D = f(V_{DS})$; $T_J = 25^\circ\text{C}$; parameter: V_{GS}

Drain-source breakdown voltage



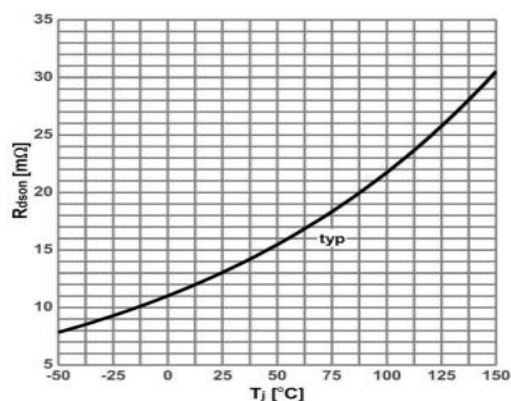
$V_{DS(iss)} = f(T_J)$; $I_D = 1\text{mA}$

Typ. drain-source on-state resistance



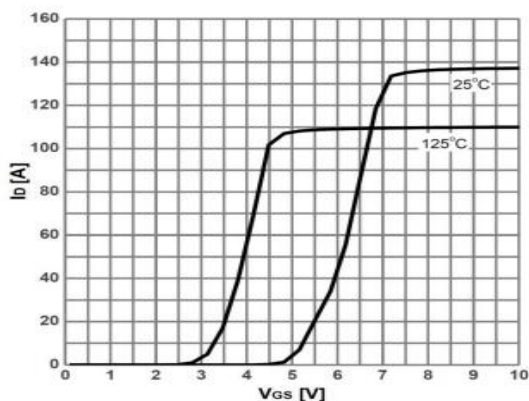
$R_{DS(on)} = f(I_D)$; $T_J = 25^\circ\text{C}$; parameter: V_{GS}

Drain-source on-state resistance



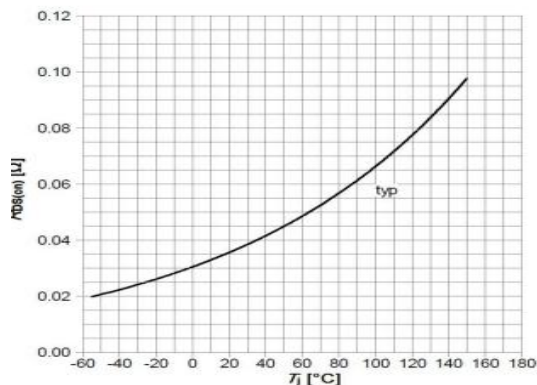
$R_{DS(on)} = f(T_J)$; $I_D = 36\text{A}$; $V_{GS} = 10\text{V}$

Typ. transfer characteristics



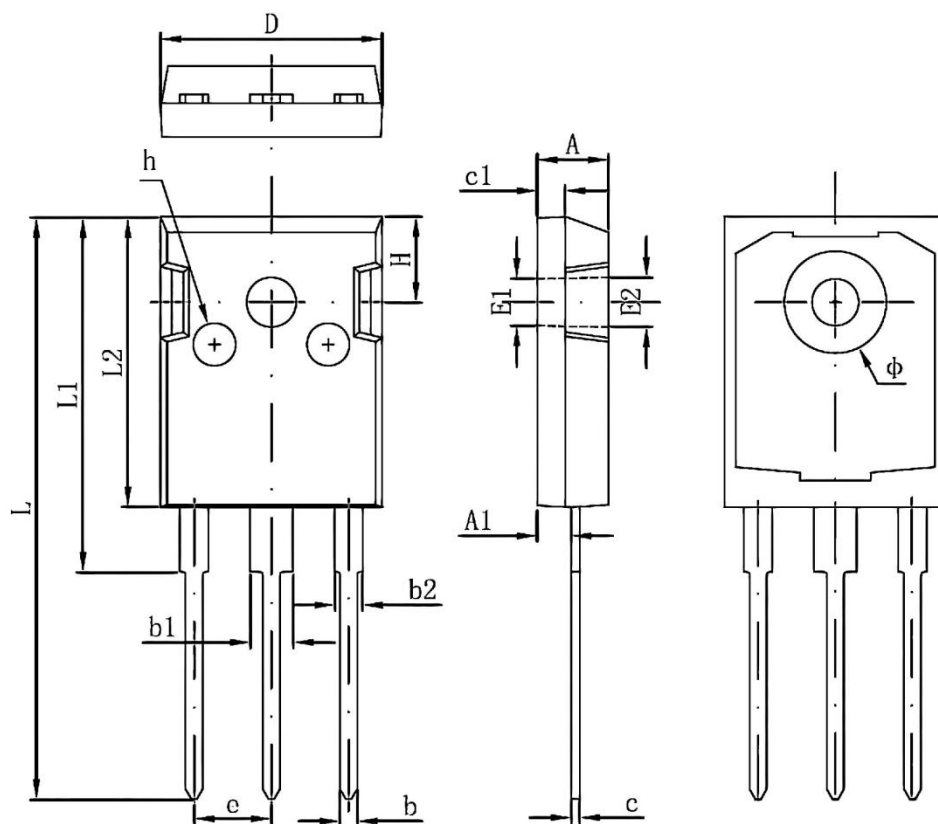
$I_D = f(V_{GS})$; $V_{DS} = 200\text{V}$; parameter: T_J

Typ. gate charge



$V_{GS} = f(Q_{gate})$; $I_D = 40\text{A}$ pulsed; $V_{DS} = 200\text{V}$

TO-247AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF.		0.138 REF.	
E2	3.600 REF.		0.142 REF.	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
φ	7.100	7.300	0.280	0.287
e	5.450 TYP.		0.215 TYP.	
H	5.980 REF.		0.235 REF.	
h	0.000	0.300	0.000	0.012