

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
650V	470mΩ@10V	20A

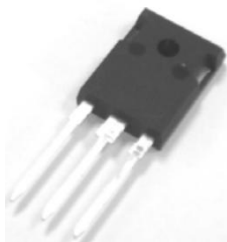
Feature

- Fast switching capability
- Avalanche energy tested
- Improved dv/dt capability, high ruggedness

Application

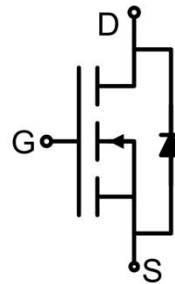
- High speed switching applications
- Switching power supplies and adaptors

Package



TO-247AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	650	V
Gate-Source Voltage	V _{GS}	±30	V
Continuous Drain Current (T _C =25°C)	I _D	20	A
Continuous Drain Current (T _C =100°C)	I _D (100°C)	14.1	A
Pulsed Drain Current ¹⁾	I _{DM}	80	A
Single Pulse Avalanche Energy ²⁾	E _{AS}	1200	mJ
Power Dissipation	P _D	113.6	W
Thermal Resistance Junction to Case	R _{θJC}	1.1	°C/W
Operating Junction Temperature	T _J	-55 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°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 =250μA	650			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =650V, V _{GS} =0V			1	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 =250μA	2	3.2	4	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =10A		310	470	mΩ
Dynamic characteristics ³⁾						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f =1MHz		2764		pF
Output Capacitance	C _{oss}			252		
Reverse Transfer Capacitance	C _{rss}			8.8		
Total Gate Charge	Q _g	V _{DS} =520V, V _{GS} =10V I _D =20A, I _G =1mA		57		nC
Gate-Source Charge	Q _{gs}			18		
Gate-Drain Charge	Q _{gd}			19		
Turn-on delay time	t _{d(on)}	V _{DS} =325V, V _{GS} =10V I _D =20A, R _G =25Ω		42		nS
Turn-on rise time	t _r			65		
Turn-off delay time	t _{d(off)}			178		
Turn-off fall time	t _f			73		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				20	A
Diode Forward voltage ⁴⁾	V _{SD}	V _{GS} =0V, I _S =20A			1.4	V
Reverse Recovery Time ⁴⁾	T _{rr}	I _F =20A, di/dt =100A/μs		690		nS
Reverse Recovery Charge	Q _{rr}			9		μC

Notes:

- 1) Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2) L = 10mH, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
- 3) Guaranteed by design, not subject to production testing.
- 4) Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

Typical Characteristics

Fig.1 Typical Output Characteristics

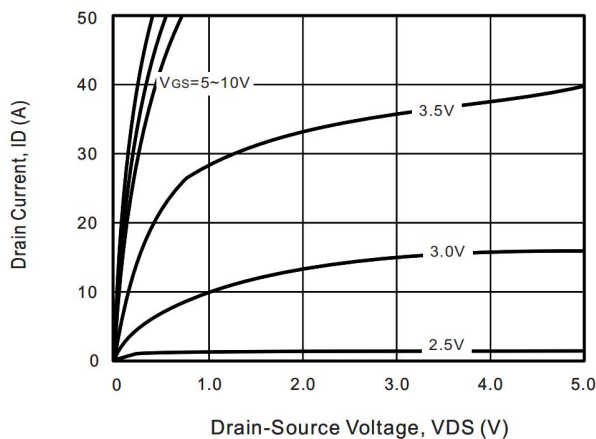


Fig.2 Power Dissipation

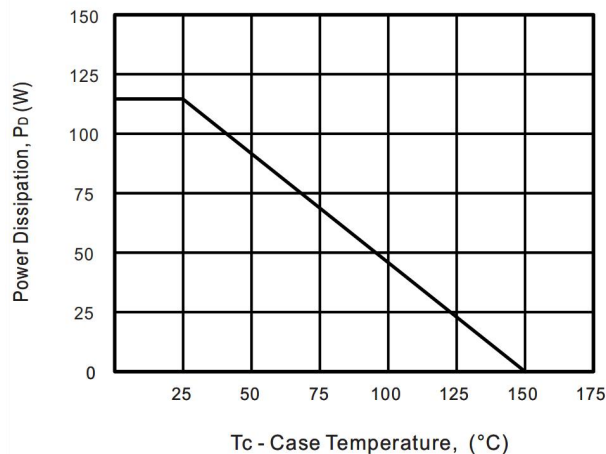


Fig.3 Drain Current Derating

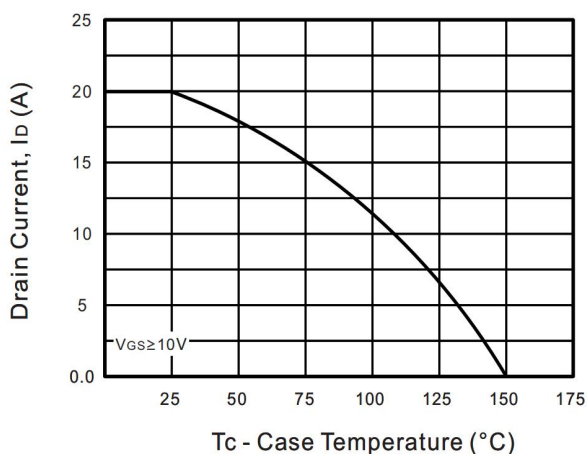


Fig.4 Drain-Source On-Resistance vs. Drain Current

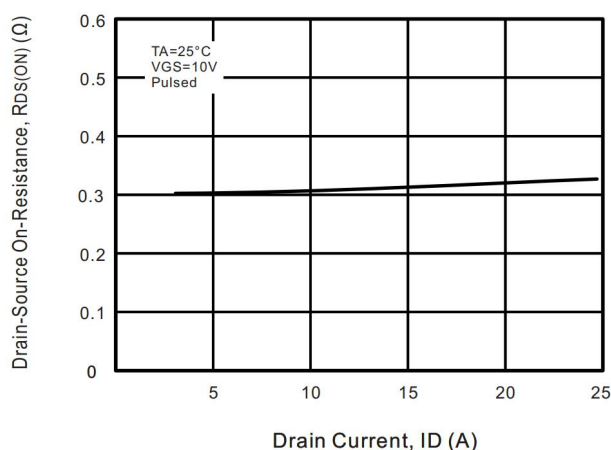


Fig.5 Gate Threshold Voltage vs. Junction Temperature

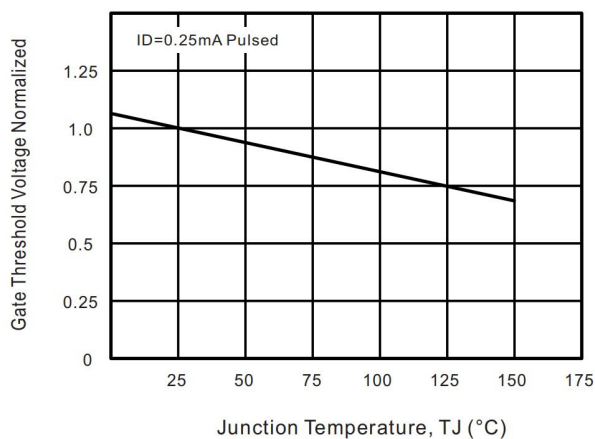
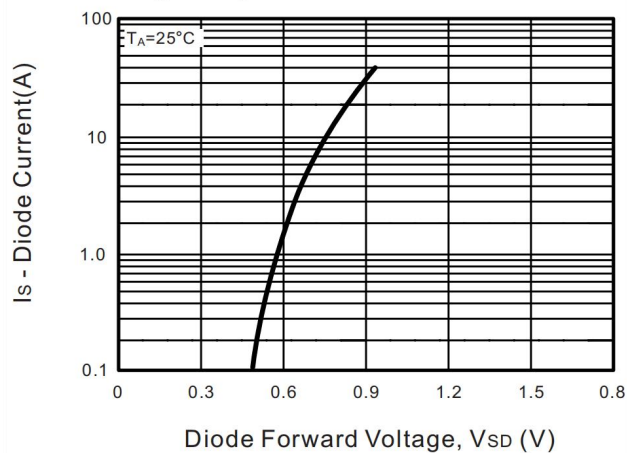


Fig.6 Body-diode Forward Characteristics



Typical Characteristics

Fig.7 Drain-Source On-Resistance vs. Junction Temperature

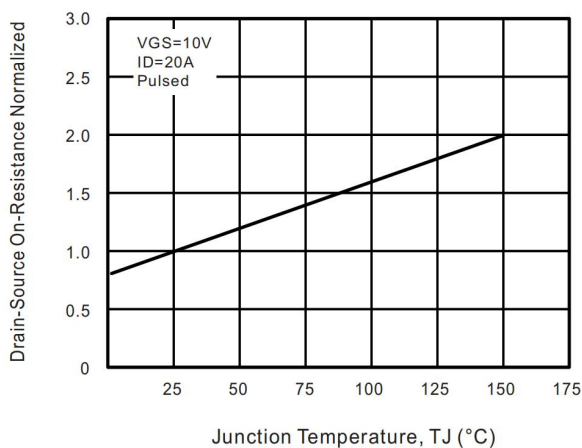


Fig.8 Breakdown Voltage vs. Junction Temperature

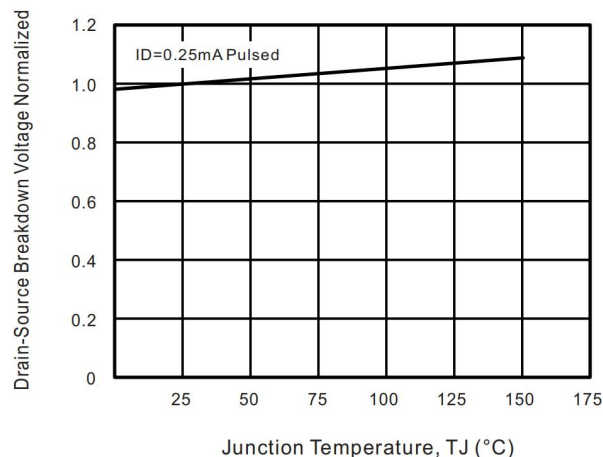


Fig.9 Capacitance Characteristics

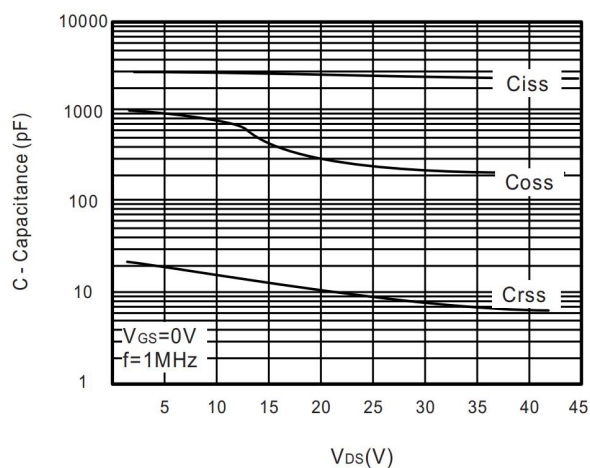


Fig.10 Gate Charge Characteristics

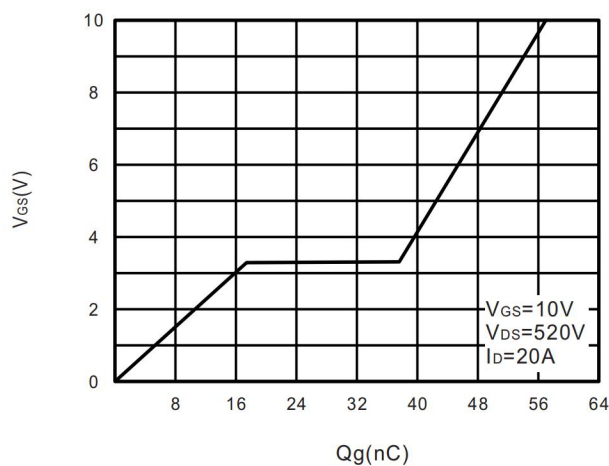
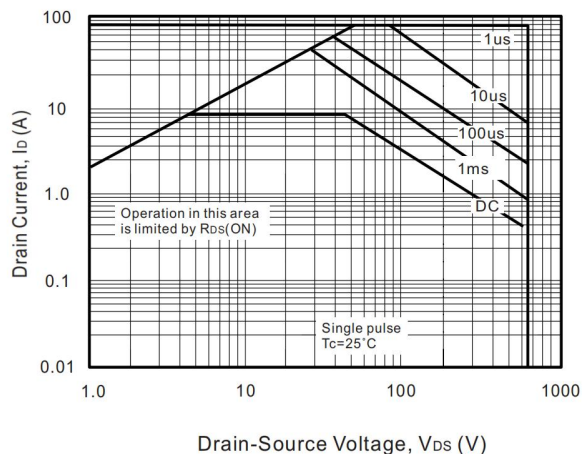
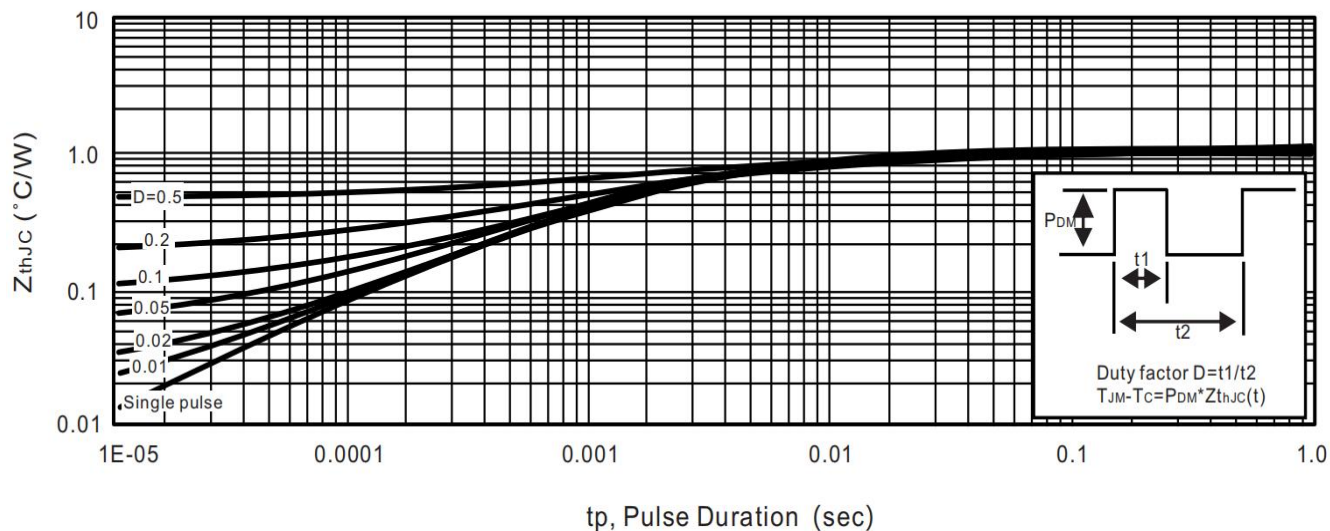


Fig.11 Safe Operating Area

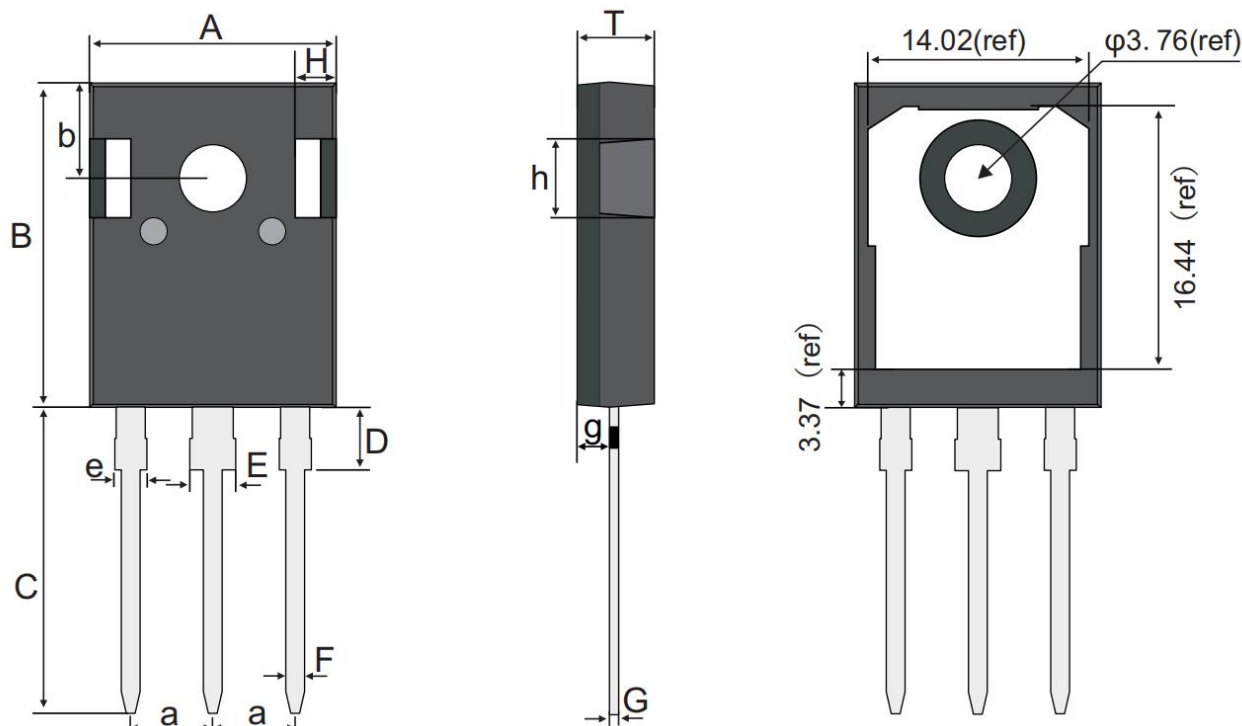


Typical Characteristics

Fig.12 Max. Transient Thermal Impedance



TO-247AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	15.610	16.010	0.615	0.630
a	5.340	5.540	0.210	0.218
B	20.780	21.180	0.818	0.834
b	6.060	6.260	0.239	0.246
C	19.800	20.200	0.780	0.795
D	4.050	4.250	0.159	0.167
E	2.950	3.250	0.116	0.128
e	1.900	2.200	0.075	0.087
F	1.100	1.300	0.043	0.051
G	0.500	0.700	0.020	0.028
g	2.290	2.490	0.090	0.098
H	2.310	2.710	0.091	0.107
h	4.970	5.370	0.196	0.211
T	4.800	5.200	0.189	0.205