

General Description

The AGM15T06C combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

This device is ideal for load switch and battery protection applications.

Features

- Advance high cell density Trench technology
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance
- 100% Avalanche tested
- 100% DVDS tested

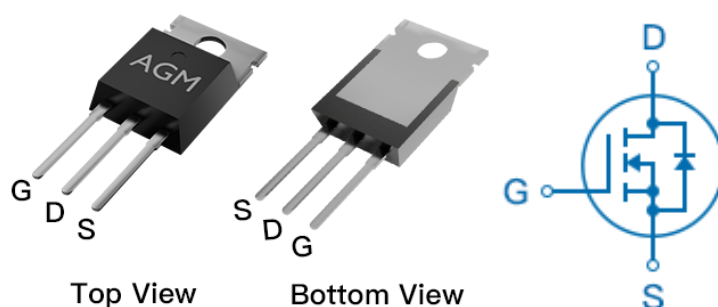
Application

- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

Product Summary

BVDSS	RDSON	ID
150V	6.5mΩ	140A

TO-220 Pin Configuration



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM15T06C	AGM15T06C	TO-220	----	----	1000

Table 1. Absolute Maximum Ratings (TA=25°C)

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	150	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	140	A
	Drain Current-Continuous(Tc=100°C)	95	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	560	A
PD	Maximum Power Dissipation(Tc=25°C)	250	w
	Maximum Power Dissipation(Tc=100°C)	100	w
EAS	Avalanche energy (Note 3)	924	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	°C

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State) ¹	---	60	°C/W
RθJC	Thermal Resistance Junction-Case ¹	---	0.5	°C/W

Table 3. Electrical Characteristics (TJ=25°C unless otherwise noted)

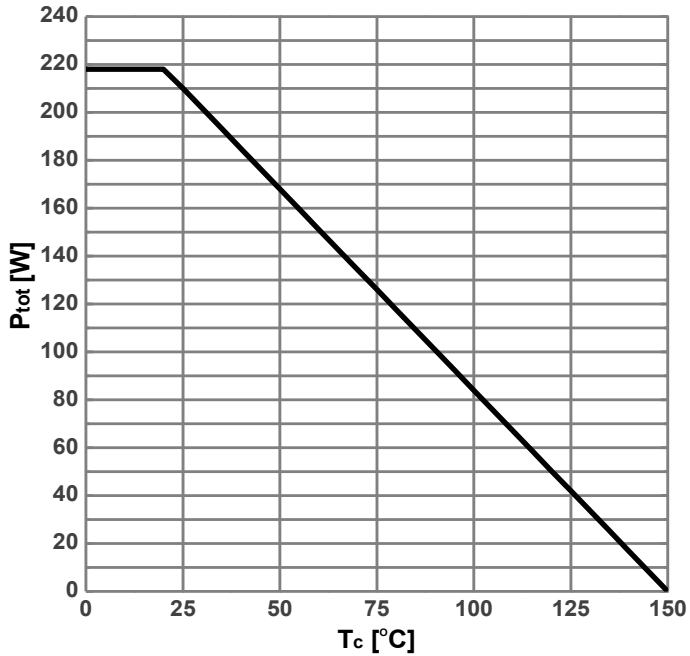
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	150	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=150V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	2.0	2.8	4.0	V
gFS	Forward Transconductance	VDS=5V,ID=10A	--	18	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=20A	--	6.5	7.5	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=75V,VGS=0V, F=1MHZ	--	5025	--	pF
Coss	Output Capacitance		--	410	--	pF
Crss	Reverse Transfer Capacitance		--	10	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	--	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=75V, ID=80A,RGEN=6Ω	--	25	--	nS
tr	Turn-on Rise Time		--	31	--	nS
td(off)	Turn-Off Delay Time		--	60	--	nS
tf	Turn-Off Fall Time		--	20	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=75V, ID=80A	--	19	--	nC
Qgs	Gate-Source Charge		--	11	--	nC
Qgd	Gate-Drain Charge		--	12	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	140	A
VSD	Forward on Voltage	VGS=0V,IS=10A	--	--	1.2	V
trr	Reverse Recovery Time	IF=10A , dl/dt=100A/μs , TJ=25℃	--	45	--	ns
Qrr	Reverse Recovery Charge		--	12	--	nc

Notes 1.The maximum current rating is package limited.

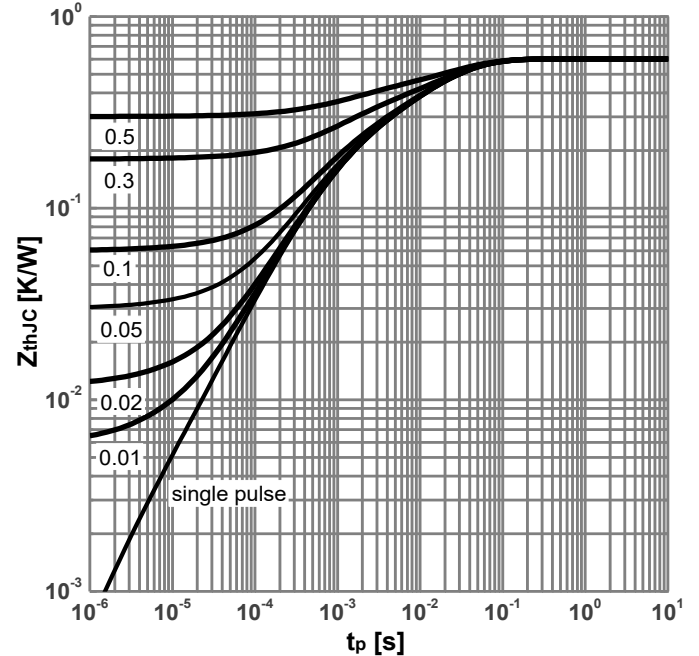
Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: TJ=25°C,VDD=50V,Vgs=10V,ID=43A, L=1mH,RG=25ohm

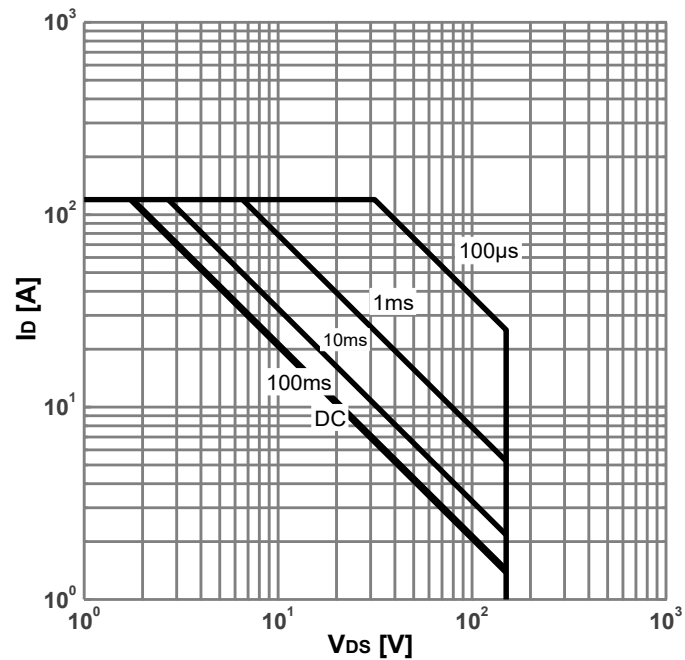
Electrical characteristics diagrams

Diagram 1: Power dissipation


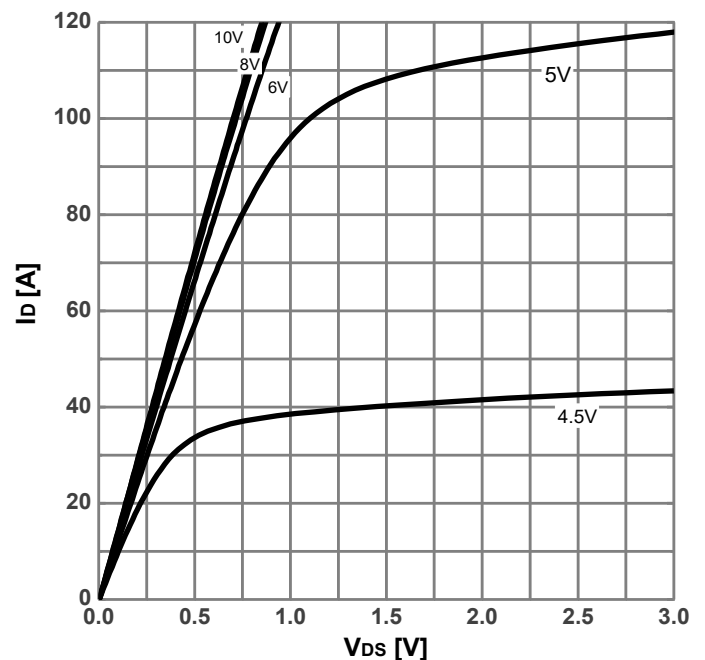
$$P_{tot}=f(T_c)$$

Diagram 2: Max. transient thermal impedance


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

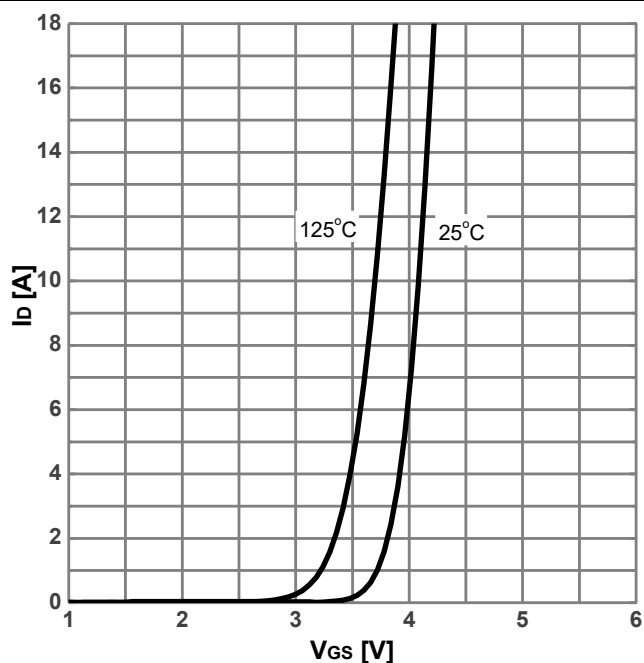
Diagram 3: Safe operating area


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

Diagram 4: Typ. output characteristics


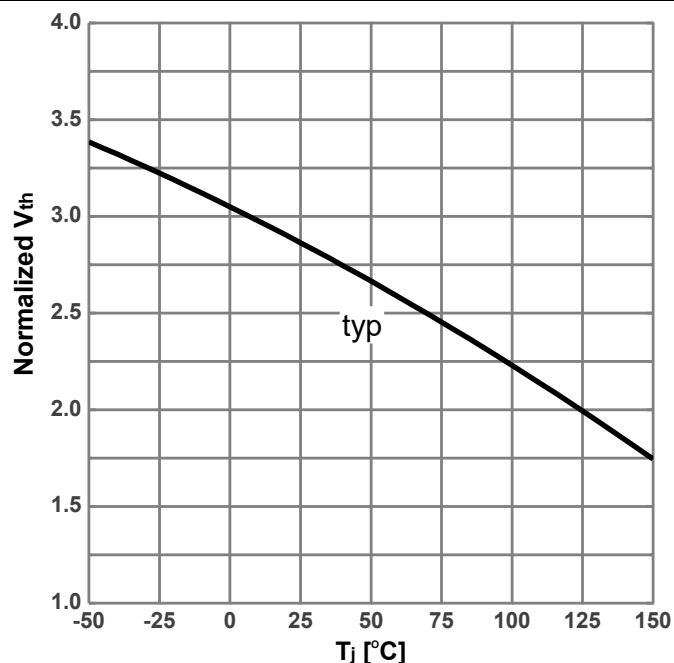
$$I_D=f(V_{DS}); T_J=25^{\circ}\text{C}; \text{ parameter: } V_{GS}$$

Diagram 5: Typ. transfer characteristics



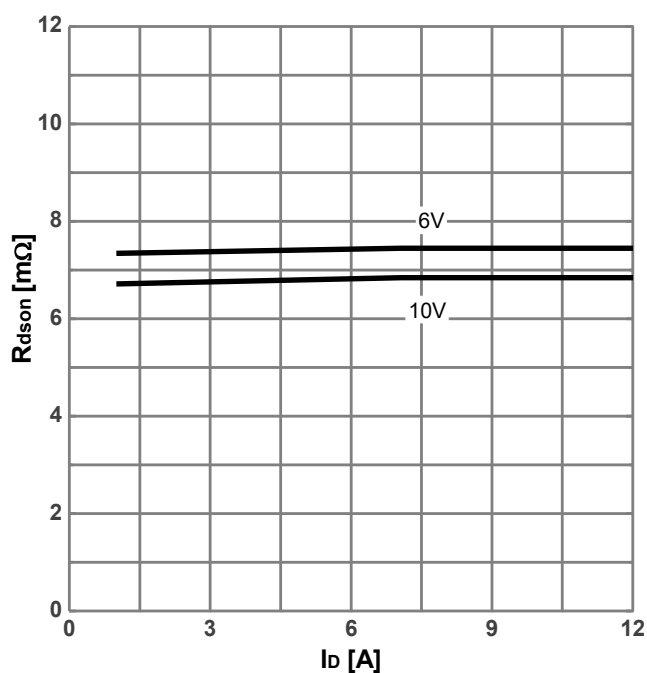
$$I_D = f(V_{GS}); V_{DS} = 5\text{V}; \text{parameter: } T_j$$

Diagram 6: Gate threshold voltage vs. Junction temperature



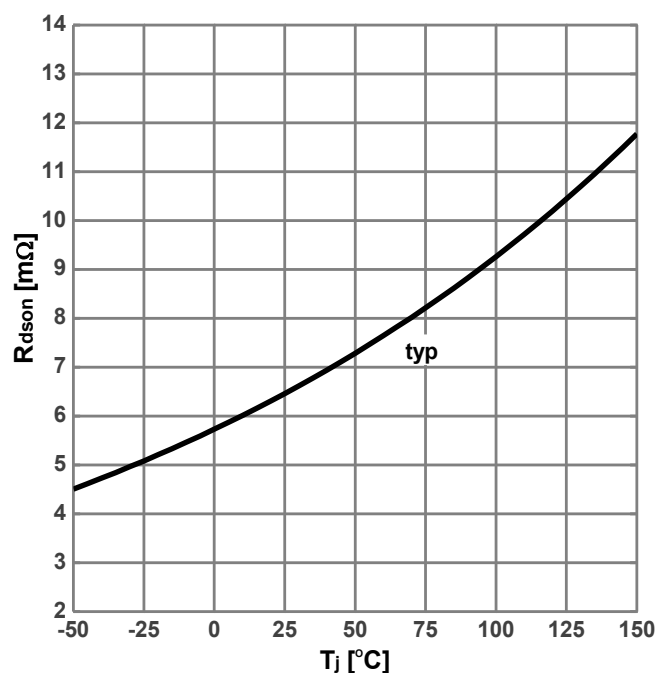
$$V_{th} = f(T_j); I_D = 250\mu\text{A}$$

Diagram 7: On-state resistance vs. Drain current



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

Diagram 8: On-state resistance vs. Junction temperature



$$R_{DS(on)} = f(T_j); I_D = 20\text{A}; V_{GS} = 10\text{V}$$

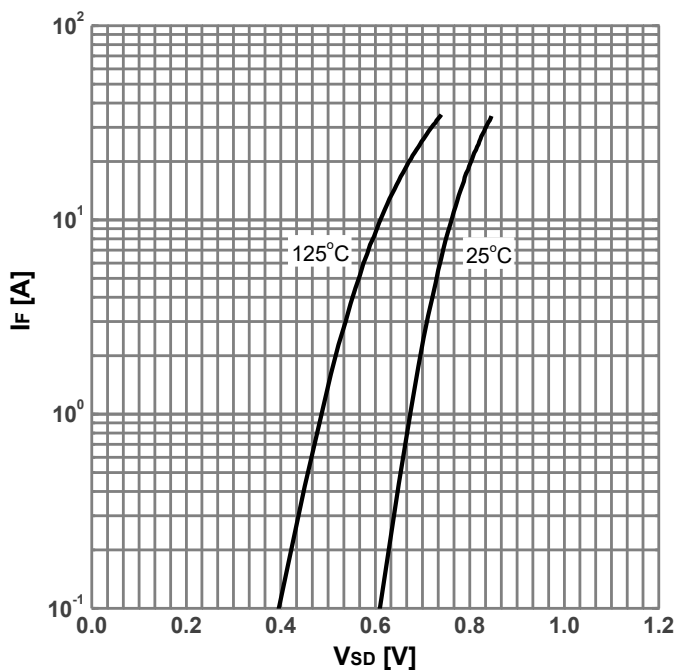
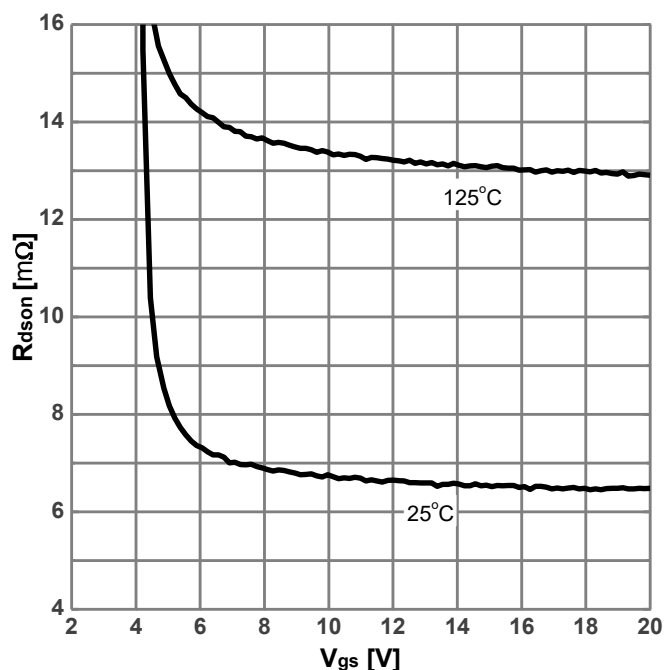
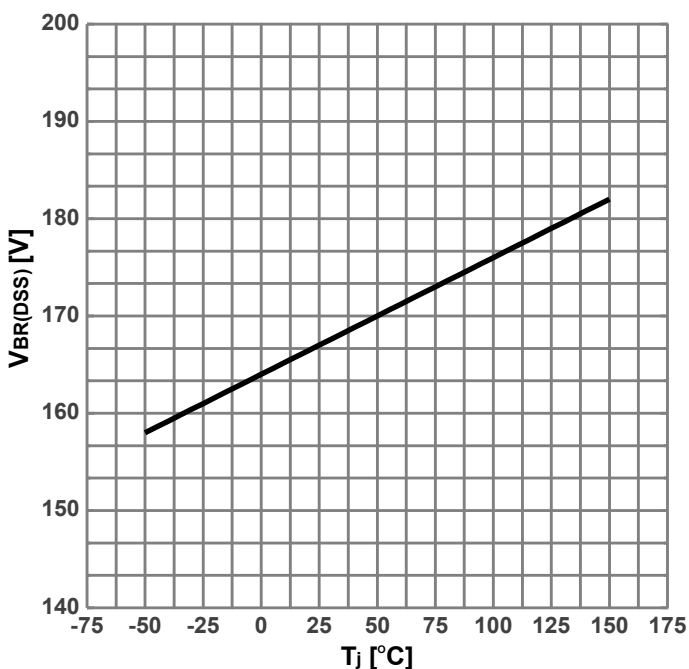
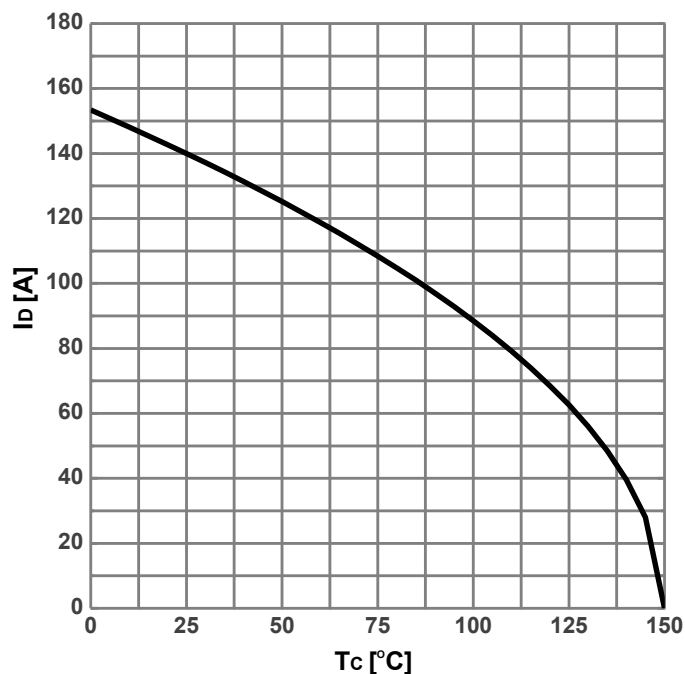
Diagram 9: Forward characteristics of reverse diode

 $I_F = f(V_{SD})$; parameter: T_j
Diagram 10: On-state resistance vs. V_{GS} characteristics

 $R_{DS(on)} = f(V_{GS})$; $I_D = 20A$; parameter: T_j
Diagram 11: Breakdown Voltage Variation vs. Temperature

 $V_{BR(DSS)} = f(T_j)$; $I_D = 250\mu A$
Diagram 12: Maximum Drain Current

 $I_D = f(T_c)$; $V_{GS} = 10V$

Diagram 13: Typ. capacitances

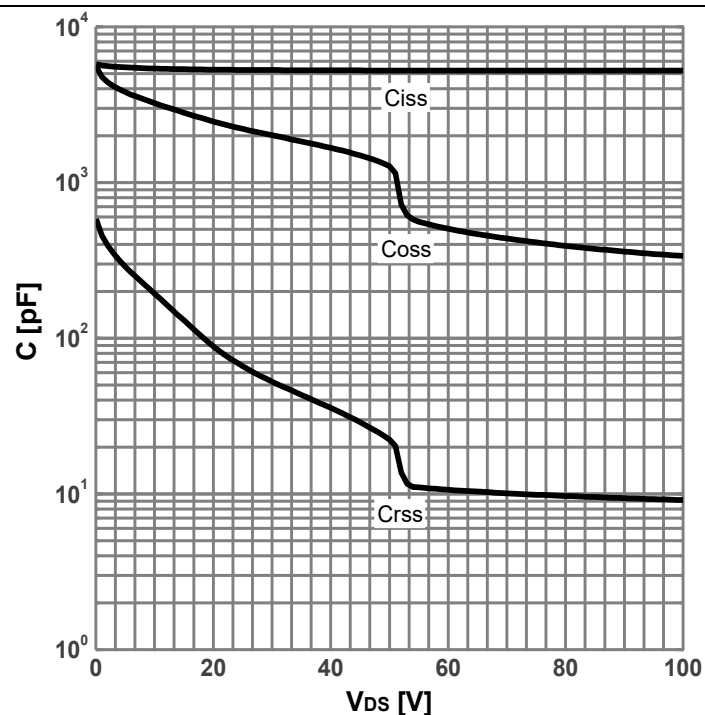
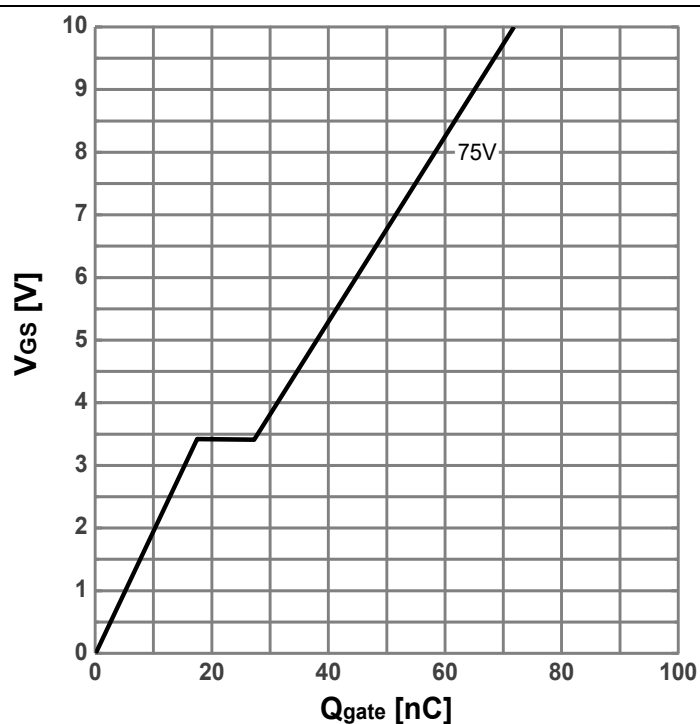
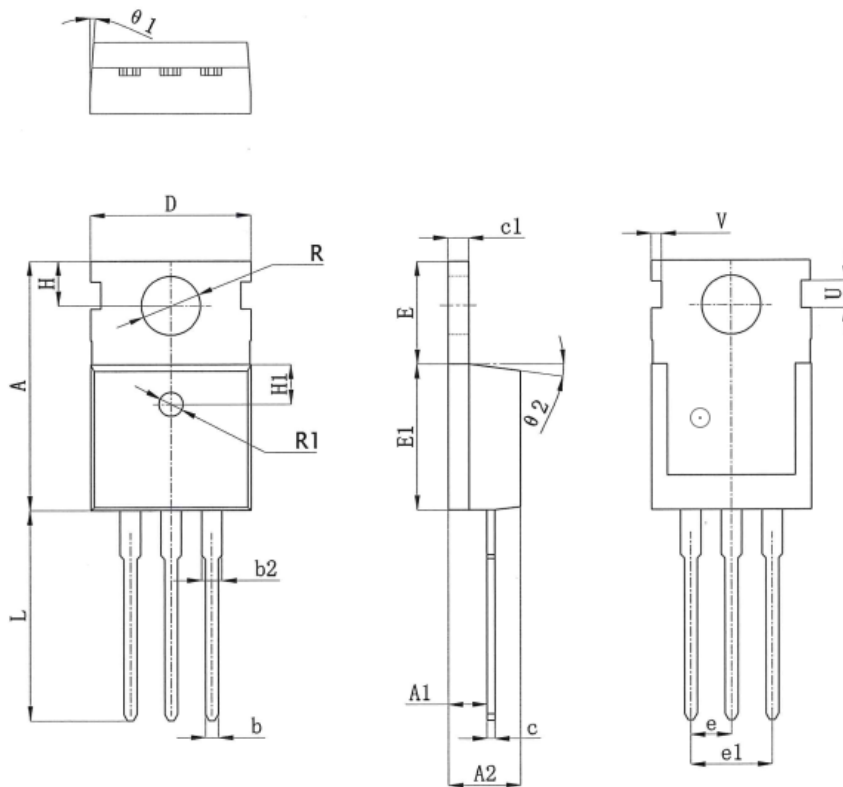

 $C=f(V_{DS}); V_{GS}=0V; f=1MHz$

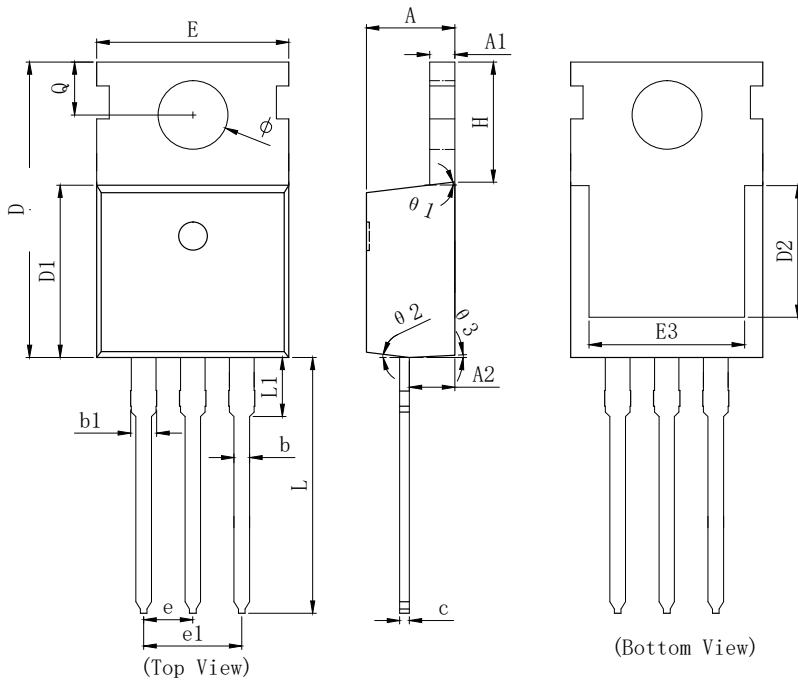
Diagram 14: Typ. gate charge


 $V_{GS}=f(Q_{gate}); I_D=20A \text{ pulsed}; V_{DS}=75V$

TO-220 PACKAGE INFORMATION



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	15.400	15.600	15.800
A1	2.350	2.400	2.500
A2	4.400	4.500	4.700
b	0.700	0.800	0.900
b2	1.180	1.310	1.440
c	0.480	0.500	0.560
c1	1.290	1.300	1.320
D	9.800	10.000	10.200
E	6.400	6.500	6.600
E1	9.000	9.100	9.200
e	2.420	2.540	2.660
e1	4.840	5.080	5.320
H	2.730	2.800	2.870
H1	2.400	2.500	2.600
L	13.020	13.370	13.720
R	3.500	3.600	3.730
R1	1.400	1.500	1.600
U	1.650	1.750	1.850
V	0.580	0.680	0.780
θ 1	2°	2.5°	3°
θ 2	6.5°	7°	7.5°



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	4.370	4.570	4.700
A1	1.250	1.300	1.400
A2	2.150	2.350	2.550
b	0.700	0.800	0.950
b1	1.170	1.270	1.470
c	0.450	0.500	0.600
D	15.100	15.600	16.100
D1	8.800	9.100	9.400
D2	5.500	6.300 REF	
E	9.700	10.000	10.300
E3	7.000	7.600 REF	
e	2.540 BSC		
e1	5.080 BSC		
L	13.200	13.500	13.800
L1		3.100	3.400
H	6.250	6.500	6.750
Φ	3.400	3.600	3.800
Q	2.600	2.800	3.000
θ 1	7° TYP		
θ 2	7° TYP		
θ 3	3° TYP		

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