## Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

Applications

- High Frequency Point-of-Load,Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

Product Summary

V_{DS}	100	V
I_D	58	A
$R_{DS(ON)}$ (at V_{GS}=10V)	22	mΩ

RoHS
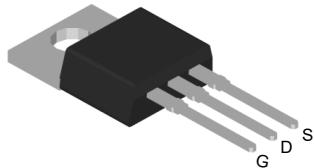
TO-220 Top View
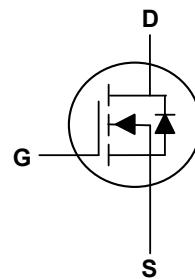
Absolute Maximum Ratings(T_A=25℃, unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, VGS @ 10V[1]	I_D@T_C=25℃	58	A
Continuous Drain Current, VGS @ 10V[1]	I_D@T_C=100℃	37	A
Pulsed Drain Current[2]	I_{DM}	130	A
Single Pulse Avalanche Energy[3]	EAS	84	mJ
Avalanche Current	I_{AS}	41	A
Total Power Dissipation[4]	P_D@T_C=25℃	149	W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient[1]	$R_{\theta JA}$	---	62	℃/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	---	0.84	℃/W

Electrical Characteristics (T$_J$=25℃, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV$_{DSS}$	V$_{GS}$=0V , I$_D$=250uA	100	---	---	V
Static Drain-Source On-Resistance[2]	R$_{DS(ON)}$	V$_{GS}$=10V , I$_D$=30A	---	---	22	mΩ
Gate Threshold Voltage	V$_{GS(th)}$	V$_{GS}$=V$_{DS}$, I$_D$ =250uA	2.5	---	4.5	V
Drain-Source Leakage Current	I$_{DSS}$	V$_{DS}$=80V, V$_{GS}$=0V, T$_J$=25℃	---	---	1	uA
		V$_{DS}$=80V, V$_{GS}$=0V, T$_J$=55℃	---	---	5	
Gate-Source Leakage Current	I$_{GSS}$	V$_{GS}$=±20V , V$_{DS}$=0V	---	---	±100	nA
Forward Transconductance	gfs	V$_{DS}$=5V , I$_D$=30A	---	31	---	S
Gate Resistance	R$_g$	V$_{DS}$=0V , V$_{GS}$=0V , f=1MHz	---	1.9	3.8	Ω
Total Gate Charge	Q$_g$	V$_{DS}$=80V , V$_{GS}$=10V , I$_D$=30A	---	27.6	---	nC
Gate-Source Charge	Q$_{gs}$		---	11.4	---	
Gate-Drain Charge	Q$_{gd}$		---	7.9	---	
Turn-On Delay Time	T$_{d(on)}$	V$_{DD}$=50V , V$_{GS}$=10V , R$_G$=3.3Ω, I$_D$=30A	---	16.5	---	ns
Rise Time	T$_r$		---	35	---	
Turn-Off Delay Time	T$_{d(off)}$		---	17.5	---	
Fall Time	T$_f$		---	12	---	
Input Capacitance	C$_{iss}$	V$_{DS}$=15V , V$_{GS}$=0V , f=1MHz	---	1890	---	pF
Output Capacitance	C$_{oss}$		---	268	---	
Reverse Transfer Capacitance	C$_{rss}$		---	67	---	

Drain-Source Diode Characteristics

| Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current[1,5]	I$_S$	V$_G$=V$_D$=0V , Force Current	---	---	58	A
Pulsed Source Current[2,5]	I$_{SM}$		---	---	130	A
Diode Forward Voltage[2]	V$_{SD}$	V$_{GS}$=0V , I$_S$=1A , T$_J$=25℃	---	---	1.2	V
Reverse Recovery Time	t$_{rr}$	I$_F$=30A , di/dt=100A/μs，T$_J$=25℃	---	22	---	nS
Reverse Recovery Charge	Q$_{rr}$		---	20	---	nC

Note:

1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The EAS data shows Max. rating . The test condition is V$_{DD}$=25V,V$_{GS}$=10V,L=0.1mH

4.The power dissipation is limited by 150℃ junction temperature

5.The data is theoretically the same as I$_D$ and I$_{DM}$, in real applications , should be limited by total power dissipation.

Typical Characteristics
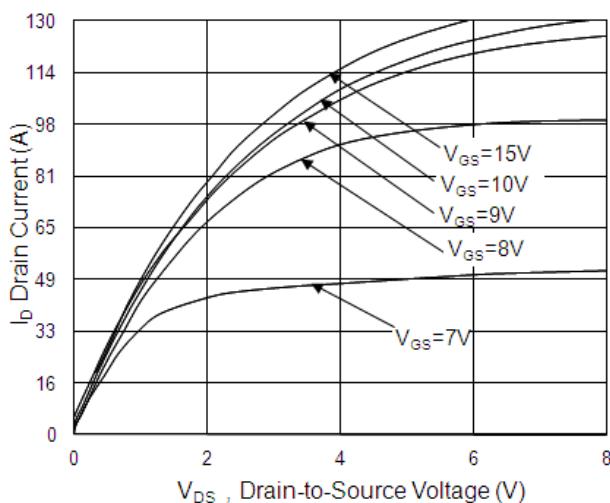
**Fig.1 Typical Output Characteristics**
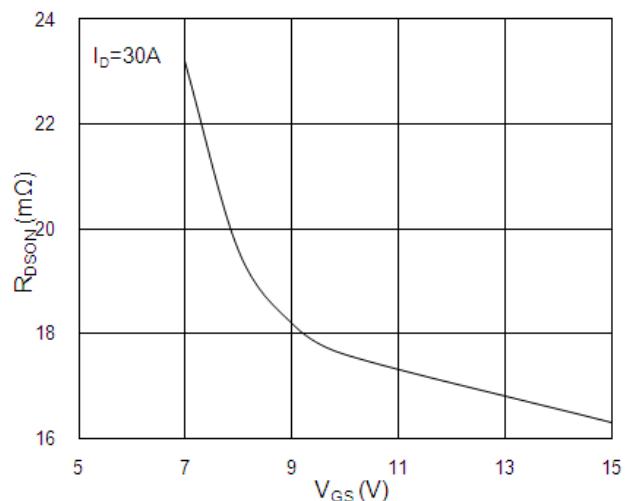


Fig.2 On-Resistance v.s Gate-Source
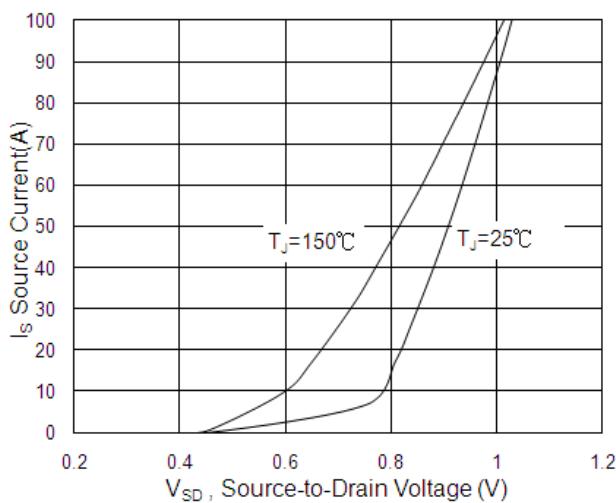
Fig.3 Forward Characteristics of Reverse
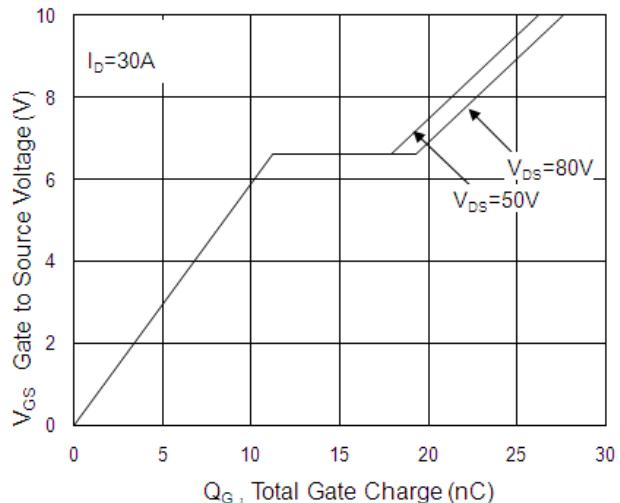

Fig.4 Gate-Charge Characteristics
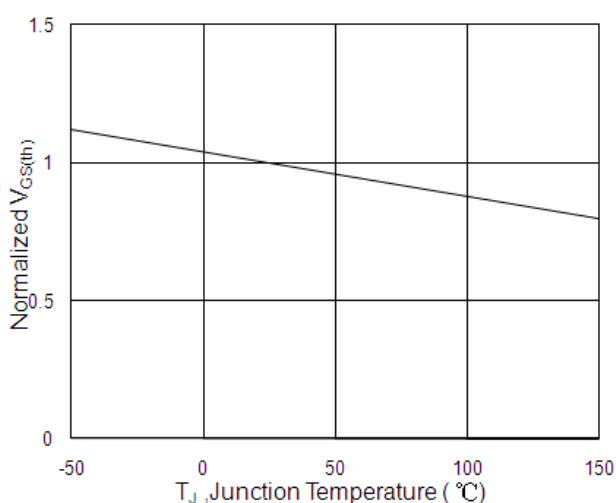
Fig.5 Normalized V$_{GS(th)}$ vs. T$_J$
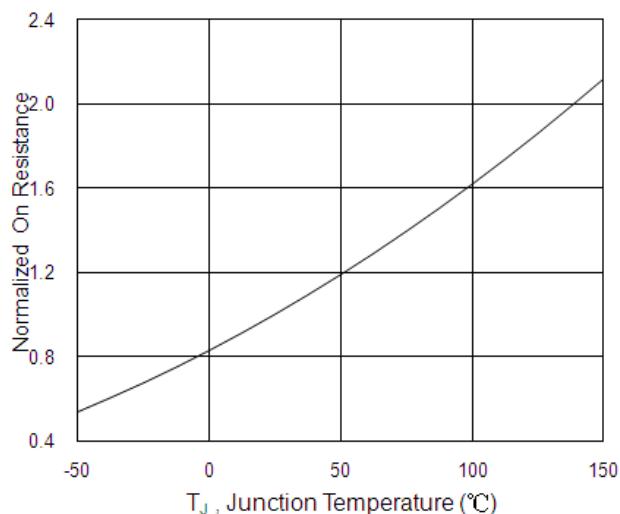
**Fig.6 Normalized R$_{DSON}$ vs. T$_J$**

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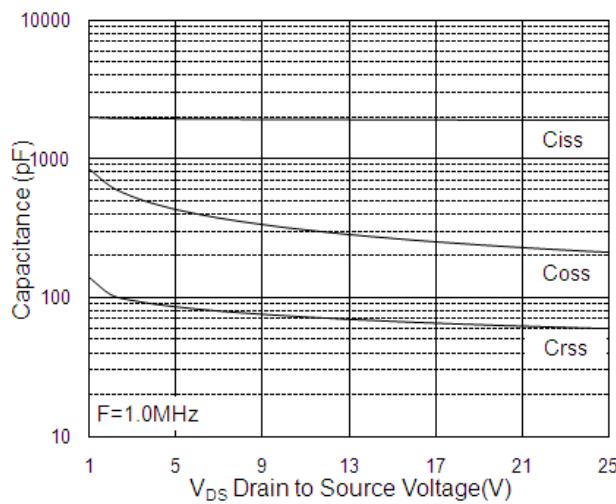
Fig.7 Capacitance
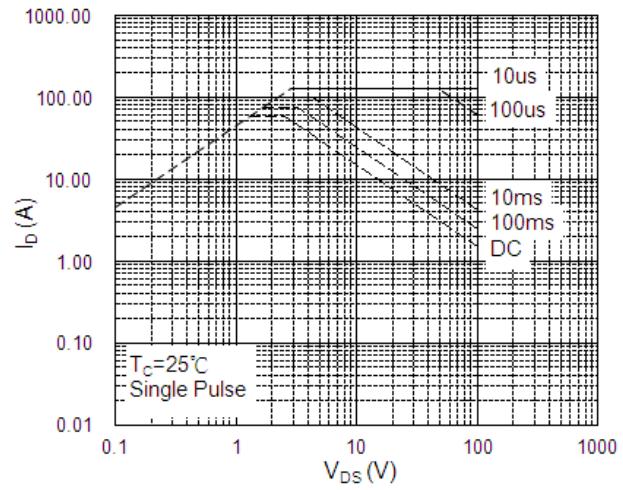
Fig.8 Safe Operating Area
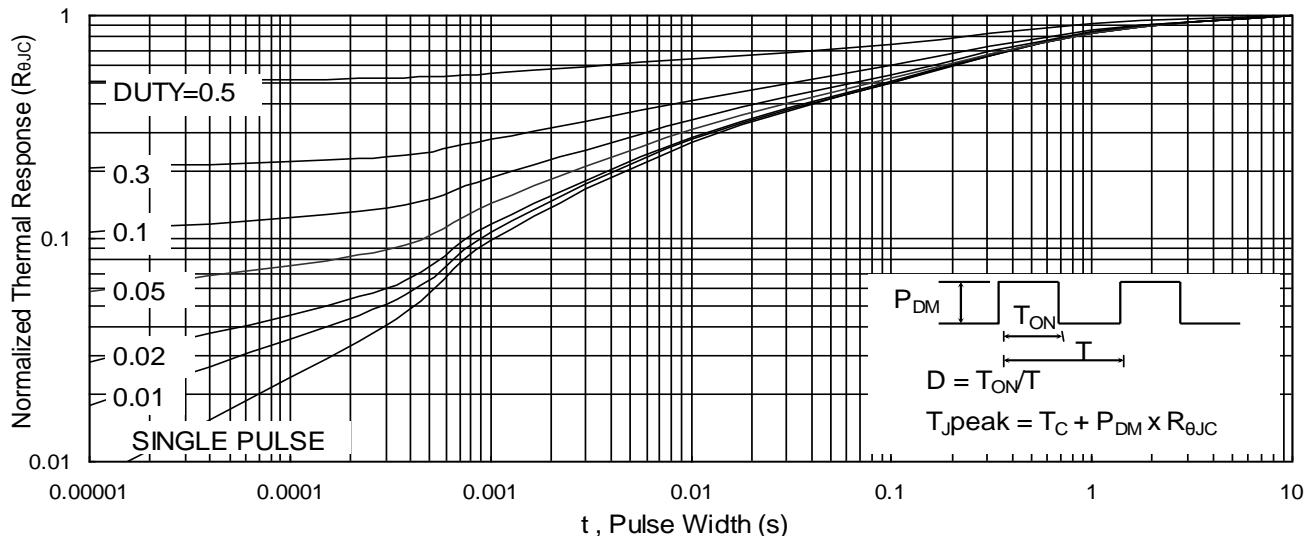
Fig.9 Normalized Maximum Transient Thermal Impedance

$$T_{J}peak = T_{C} + P_{DM} \times R_{\theta JC}$$

$$D = T_{ON}/T$$
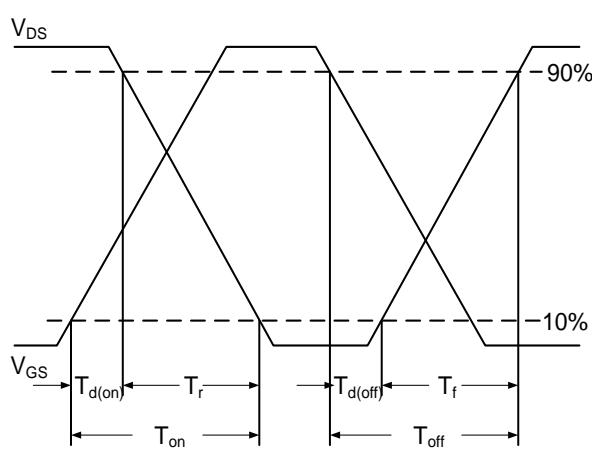
Fig.10 Switching Time Waveform

$$EAS = \frac{1}{2}L \times I_{AS}^{2} \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$
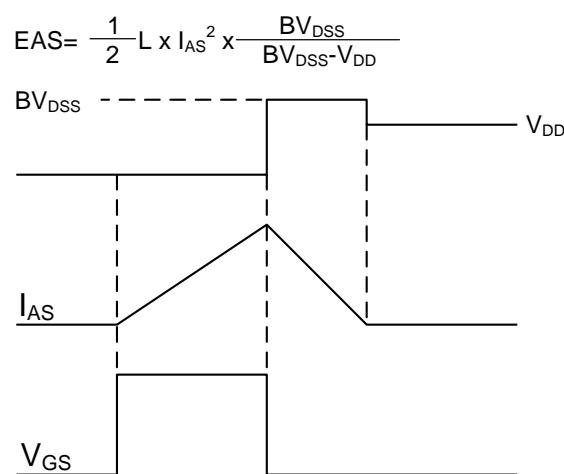
Fig.11 Unclamped Inductive Switching Waveform

TO-220 Package Outline Dimensions
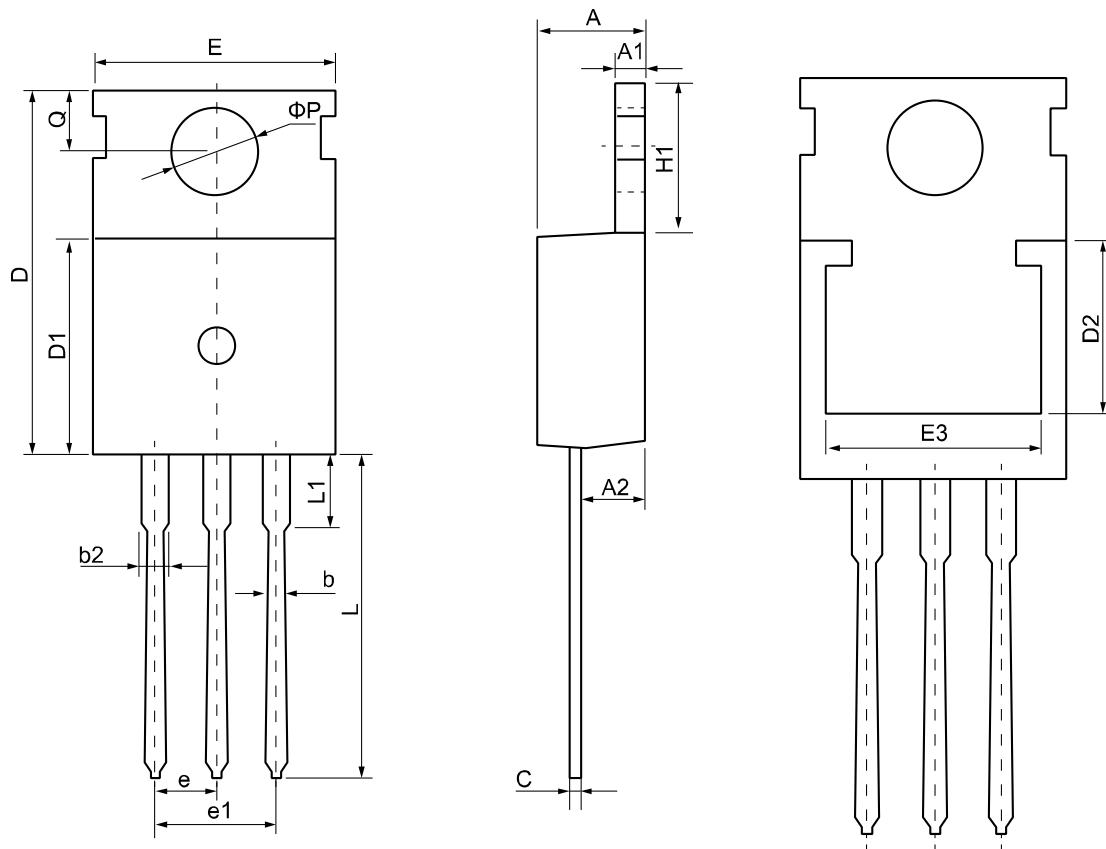
Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	4.30	4.55	4.75	E	9.65	10.00	10.25
A1	1.15	1.30	1.45	E3	7.00	--	--
A2	2.20	2.40	2.60	e	2.54 BSC		
b	0.70	0.80	0.95	e1	5.08 BSC		
b2	1.17	1.27	1.47	H1	6.30	6.50	6.80
c	0.40	0.50	0.65	L	12.70	13.50	14.10
D	15.30	15.60	15.90	L1	--	3.20	3.95
D1	8.90	9.10	9.35	φ P	3.40	3.60	3.80
D2	5.50	--	--	Q	2.60	2.80	3.00