

Features

- Advanced high cell density Trench technology
- Fast switching
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

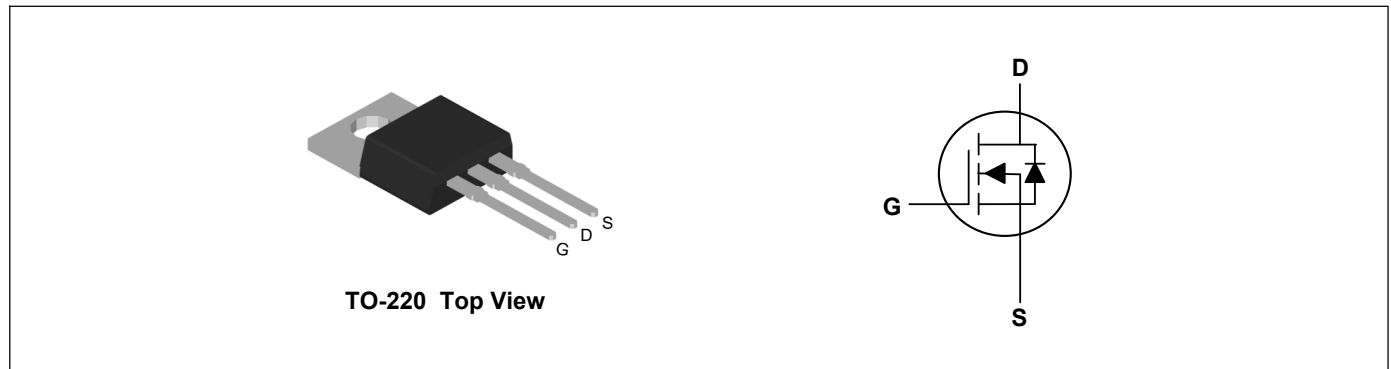
Applications

- High Frequency Point-of-Load, Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch, LED applications

Product Summary



V_{DS}	100	V
I_D	70	A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	13.5	m Ω
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	20	m Ω



Absolute Maximum Ratings ($T_C=25^\circ C$, unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	+20/-12	V
Continuous Drain Current	$I_D@T_C=25^\circ C$	70	A
Continuous Drain Current	$I_D@T_C=100^\circ C$	44	A
Pulsed Drain Current ²	I_{DM}	280	A
Single Pulse Avalanche Energy ³	EAS	115	mJ
Avalanche Current	I_{AS}	48	A
Total Power Dissipation ($T_C=25^\circ C$)	P_D	122	W
Total Power Dissipation – Derate above $25^\circ C$		0.98	W/ $^\circ C$
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ C$
Operating Junction Temperature Range	T_J	-55 to 150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	---	62	$^\circ C/W$
Thermal Resistance Junction-Case	$R_{\theta JC}$	---	1.02	$^\circ C/W$

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	100	---	---	V
BV _{DSS} Temperature Coefficient	ΔBV _{DSS} /ΔT _J	Reference to 25°C, I _D =1mA	---	0.06	---	V/°C
Static Drain-Source On-Resistance ²	R _{DS(ON)}	V _{GS} =10V, I _D =20A	---	11.4	13.5	mΩ
		V _{GS} =4.5V, I _D =15A	---	15.6	20	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250μA	1.0	1.5	2.5	V
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)}		---	-5.1	---	mV/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V, T _J =25°C	---	---	1	μA
		V _{DS} =80V, V _{GS} =0V, T _J =125°C	---	---	10	
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
Forward Transconductance	g _{fs}	V _{DS} =10V, I _D =3A	---	12	---	S
Gate Resistance	R _g	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	1.14	---	Ω
Total Gate Charge	Q _g	V _{DS} =50V, V _{GS} =10V, I _D =10A	---	27.8	55	nC
Gate-Source Charge	Q _{gs}		---	3.5	7	
Gate-Drain Charge	Q _{gd}		---	8.8	17	
Turn-On Delay Time	T _{d(on)}	V _{DD} =50V, V _{GS} =10V, R _G =6Ω, I _D =10A	---	14.2	28	ns
Rise Time	T _r		---	20.8	42	
Turn-Off Delay Time	T _{d(off)}		---	42	84	
Fall Time	T _f		---	30	60	
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f=1MHz	---	1640	3280	pF
Output Capacitance	C _{oss}		---	240	480	
Reverse Transfer Capacitance	C _{rss}		---	4	10	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	---	---	70	A
Pulsed Source Current	I _{SM}		---	---	140	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1	V
Reverse Recovery Time ²	t _{rr}	I _S =10A, di/dt=100A/μs, T _J =25°C	---	43.5	---	nS
Reverse Recovery Charge ²	Q _{rr}		---	59.6	---	nC

Note:

- The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
- The EAS data shows Max. rating. The test condition is V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=48A, R_G=25Ω
- The power dissipation is limited by 150°C junction temperature

Typical Characteristics

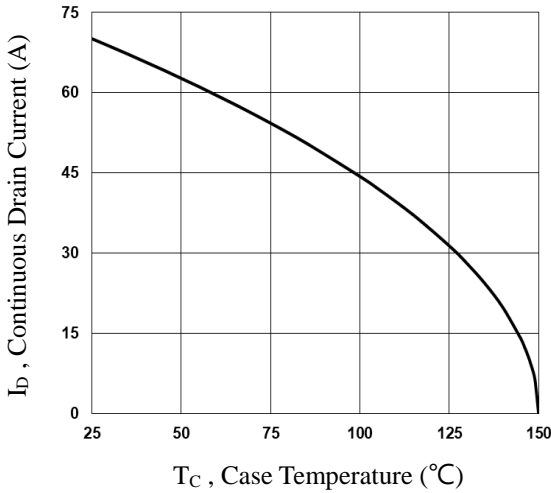


Fig.1 Continuous Drain Current vs. T_c

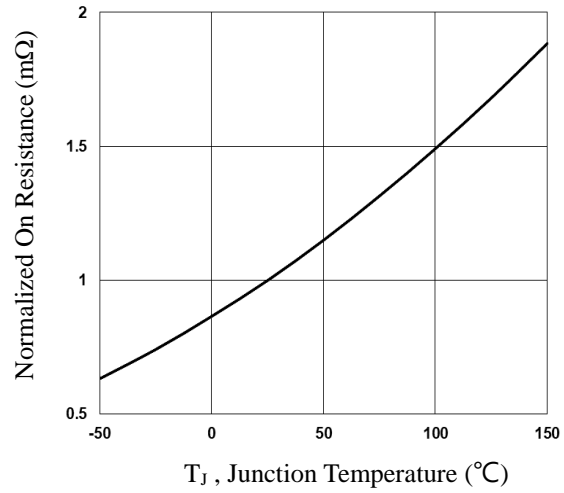


Fig.2 Normalized RDSON vs. T_j

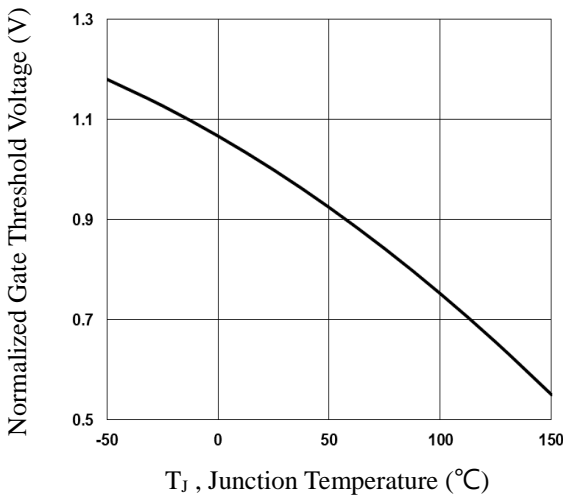


Fig.3 Normalized V_{th} vs. T_j

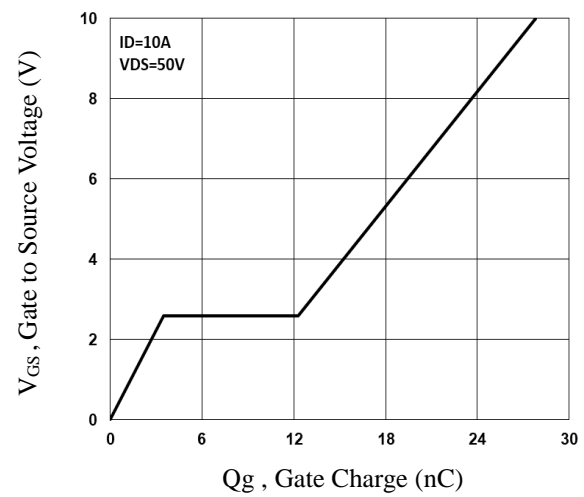


Fig.4 Gate Charge Characteristics

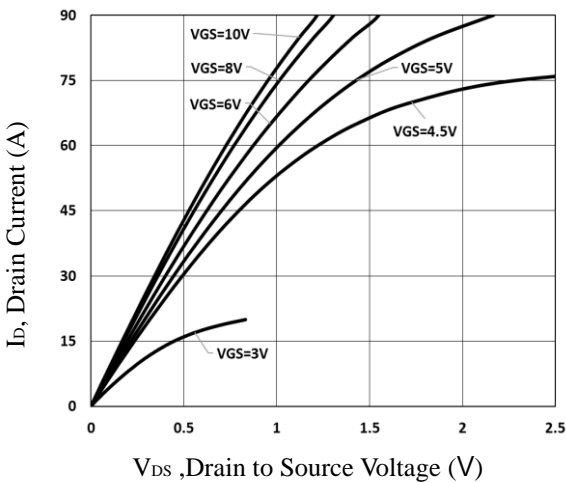


Fig.5 Typical Output Characteristics

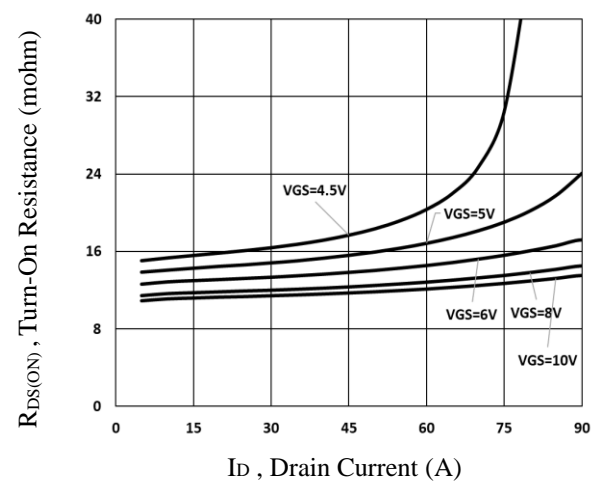


Fig.6 Turn-On Resistance vs. I_D

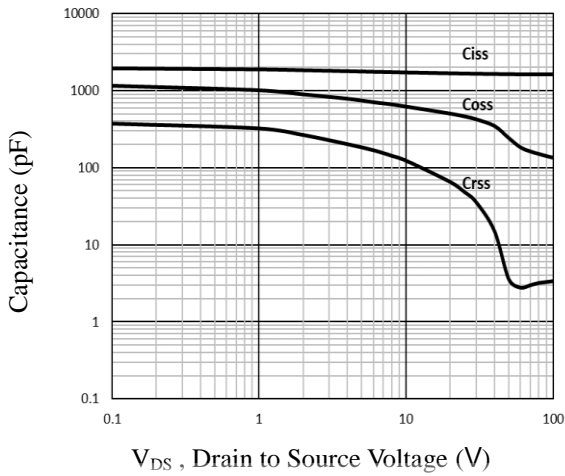


Fig.7 Capacitance Characteristics

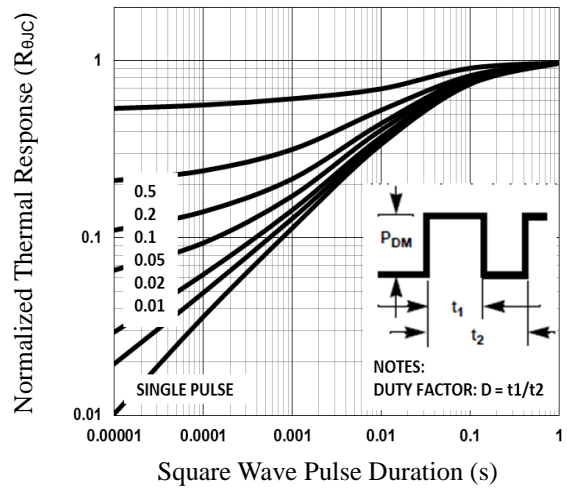


Fig.8 Normalized Transient Impedance

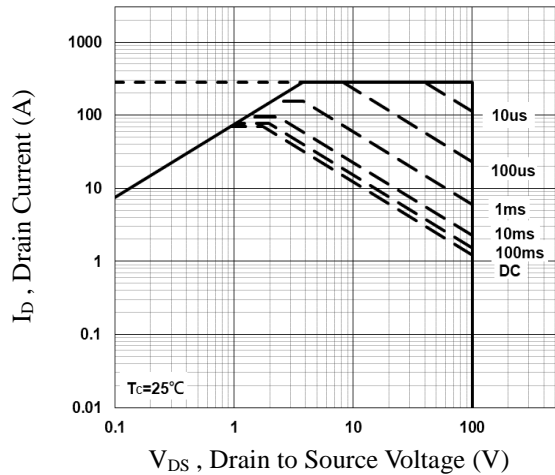


Fig.9 Maximum Safe Operation Area

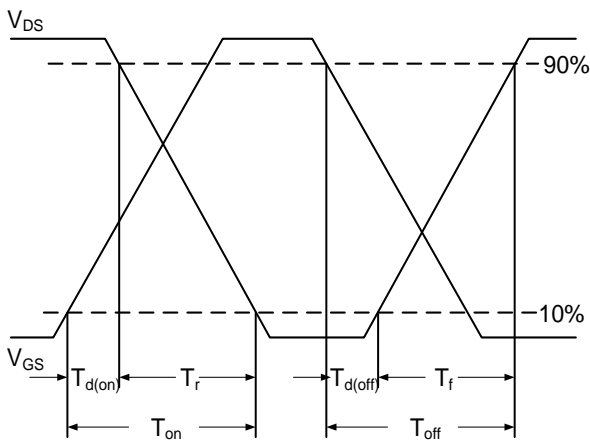


Fig.10 Switching Time Waveform

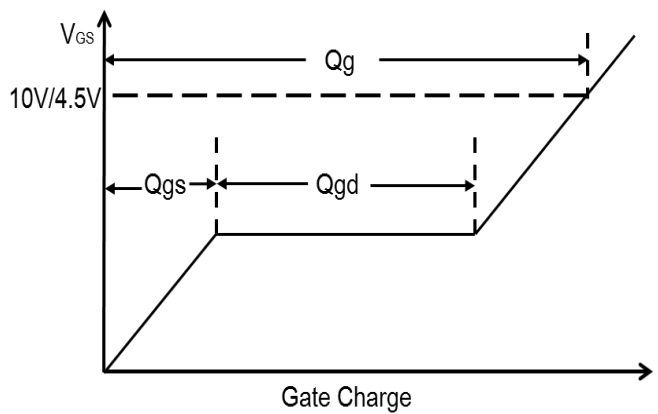
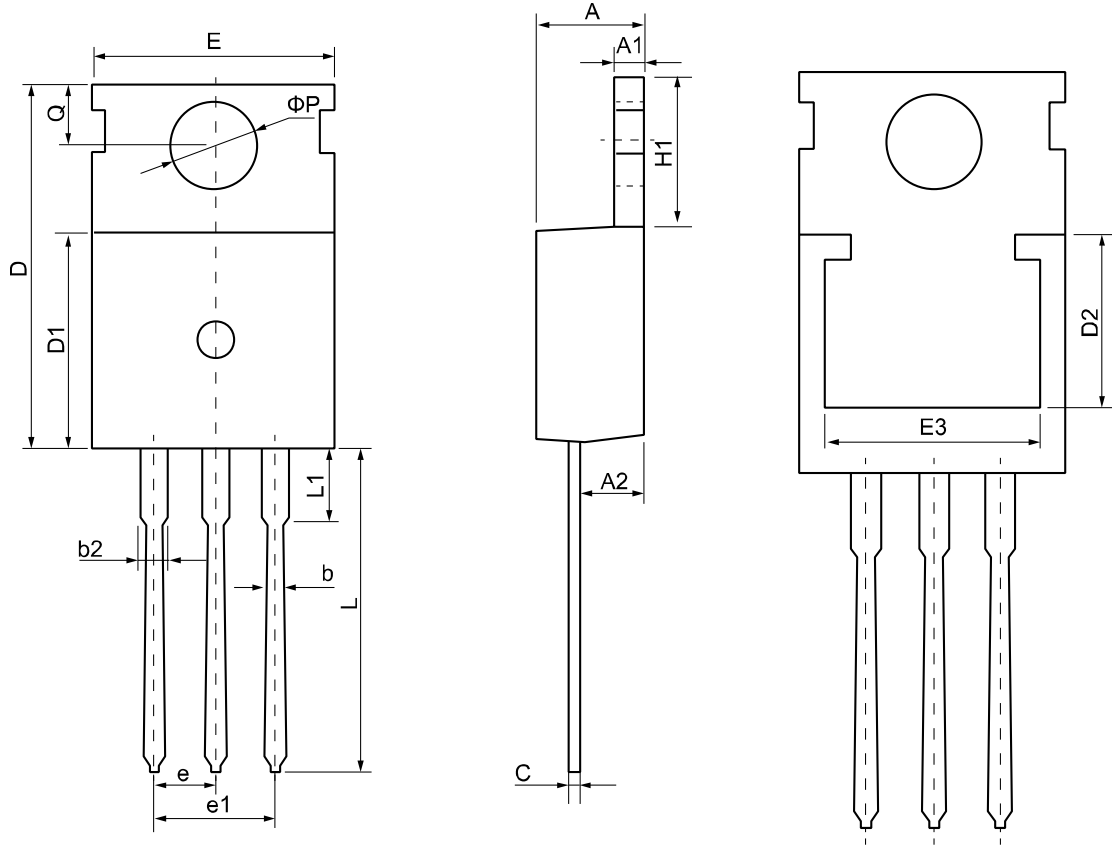


Fig.11 Gate Charge Waveform

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	phi P	3.40	3.60	3.80
D2	5.50	--	--	Q	2.60	2.80	3.00