

Features

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

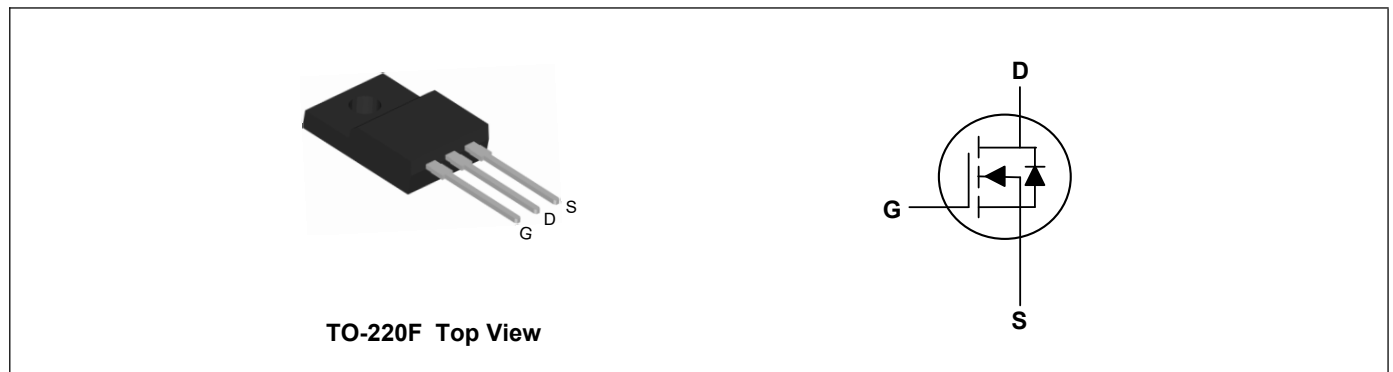
Product Summary



V_{DS}	120	V
I_D	60	A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	12	m Ω

Applications

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



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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	120	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	60	A
Continuous Drain Current	$I_{D@T_C=100^{\circ}C}$	42.4	A
Pulsed Drain Current	I_{DM}	240	A
Single Pulse Avalanche Energy ³	EAS	290	mJ
Total Power Dissipation	P_D	30	W
Storage Temperature Range	T_{STG}	-55 to 175	$^{\circ}C$
Operating Junction Temperature Range	T_J	-55 to 175	$^{\circ}C$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	---	3.5	$^{\circ}C/W$

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 =250uA	120	---	---	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =30A	---	10	12	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250uA	1.0	1.7	2.5	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =120V, V _{GS} =0V, T _J =25°C	---	---	1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =30A	---	40	---	S
Total Gate Charge	Q _g	V _{DS} =60V, V _{GS} =10V, I _D =30A	---	37	---	nC
Gate-Source Charge	Q _{gs}		---	14	---	
Gate-Drain Charge	Q _{gd}		---	8	---	
Turn-On Delay Time	T _{d(on)}	V _{DD} =50V, I _D =30A, V _{GS} =10V, R _G =3Ω	---	11	---	ns
Rise Time	T _r		---	7.5	---	
Turn-Off Delay Time	T _{d(off)}		---	26	---	
Fall Time	T _f		---	4	---	
Input Capacitance	C _{iss}	V _{DS} =60V, V _{GS} =0V, f=1MHz	---	2500	---	pF
Output Capacitance	C _{oss}		---	273	---	
Reverse Transfer Capacitance	C _{rss}		---	27	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current ²	I _S		---	---	60	A
Diode Forward Voltage ¹	V _{SD}	V _{GS} =0V, I _F =30A, T _J =25°C	---	---	1.2	V
Reverse Recovery Time	t _{rr}	I _F =I _S , di/dt=100A/μs, T _J =25°C	---	58	---	nS
Reverse Recovery Charge	Q _{rr}		---	149	---	nC

Note:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
3. ESD condition: T_J=25°C, V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_G=25Ω

Typical Characteristics

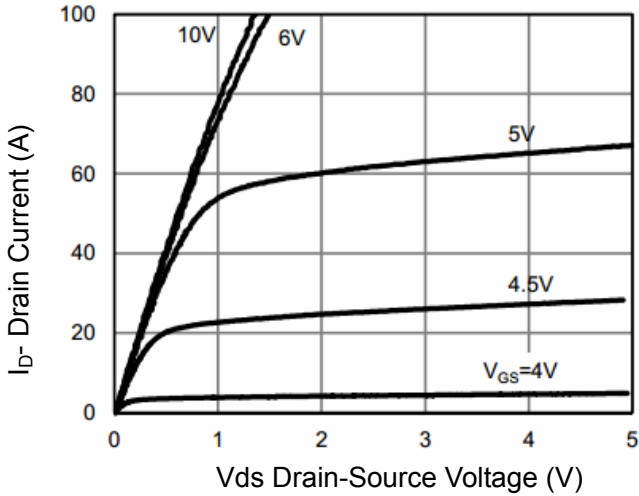


Figure 1 Output Characteristics

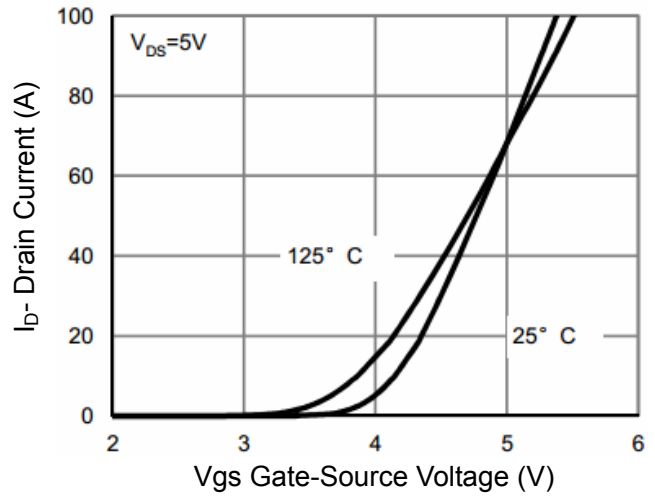


Figure 2 Transfer Characteristics

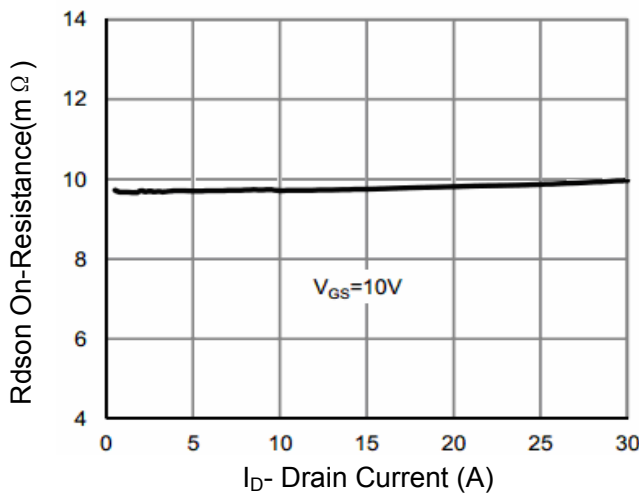


Figure 3 Rdson- Drain Current

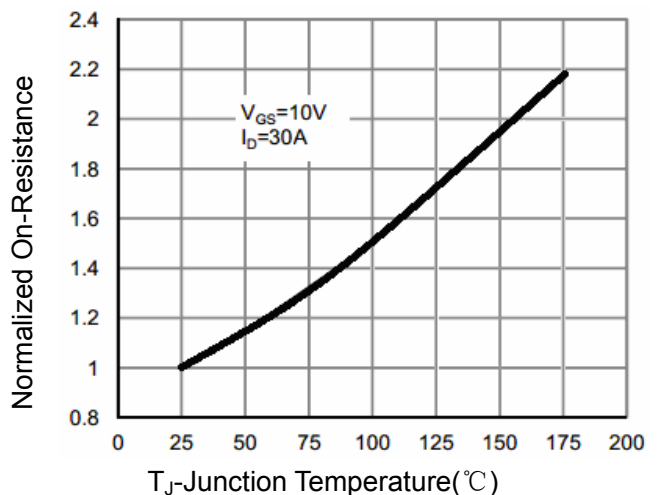


Figure 4 Rdson-Junction Temperature

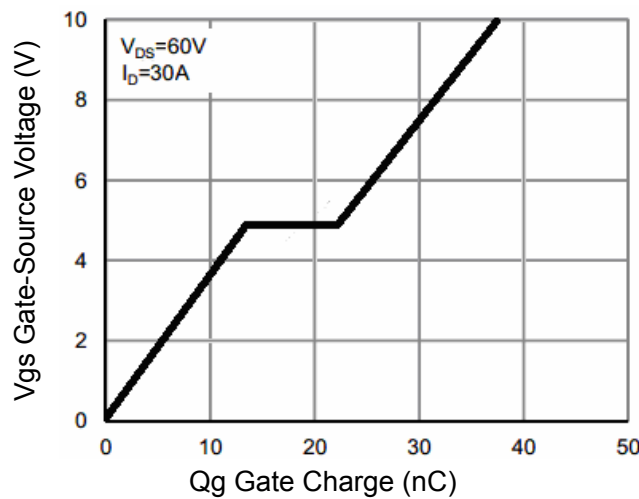


Figure 5 Gate Charge

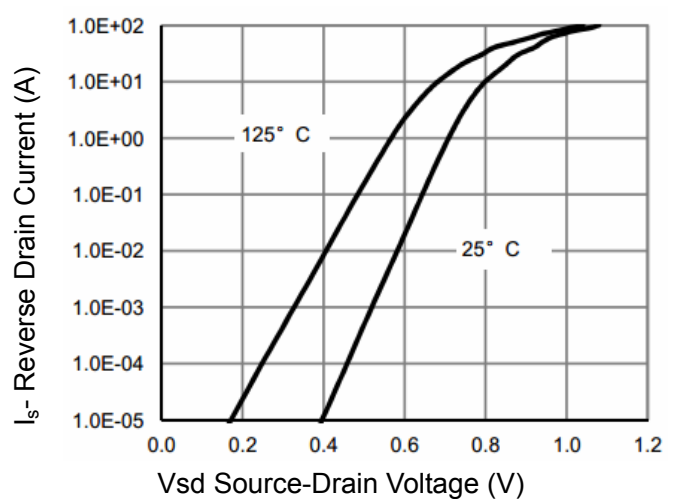


Figure 6 Source- Drain Diode Forward

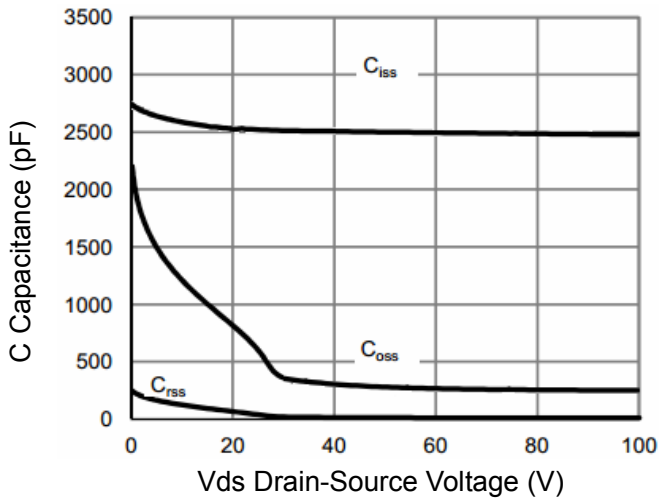


Figure 7 Capacitance vs Vds

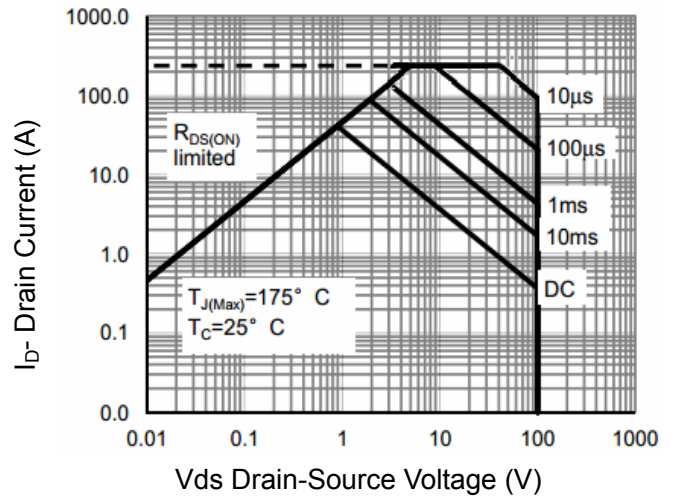


Figure 8 Safe Operation Area

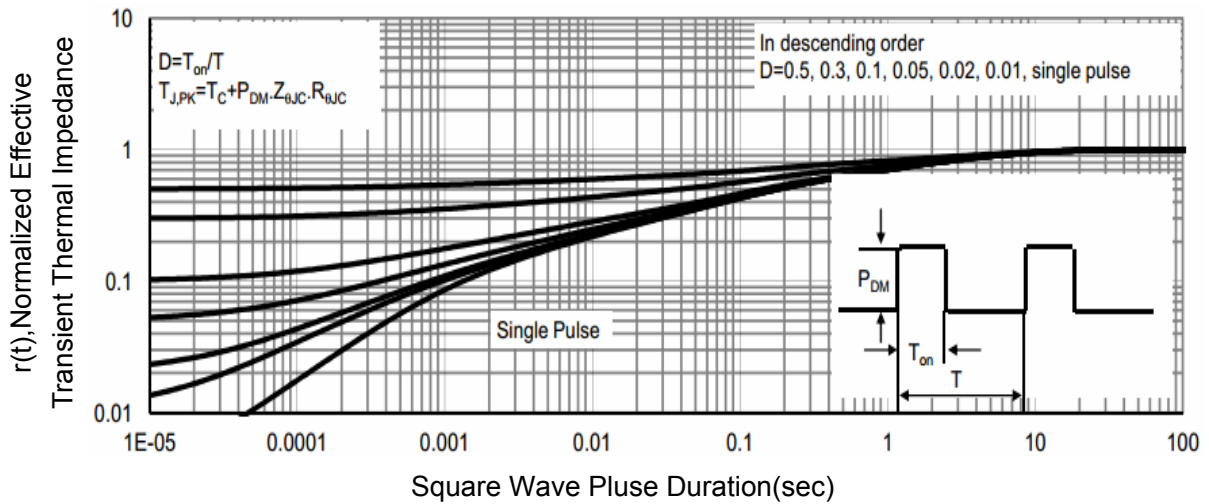
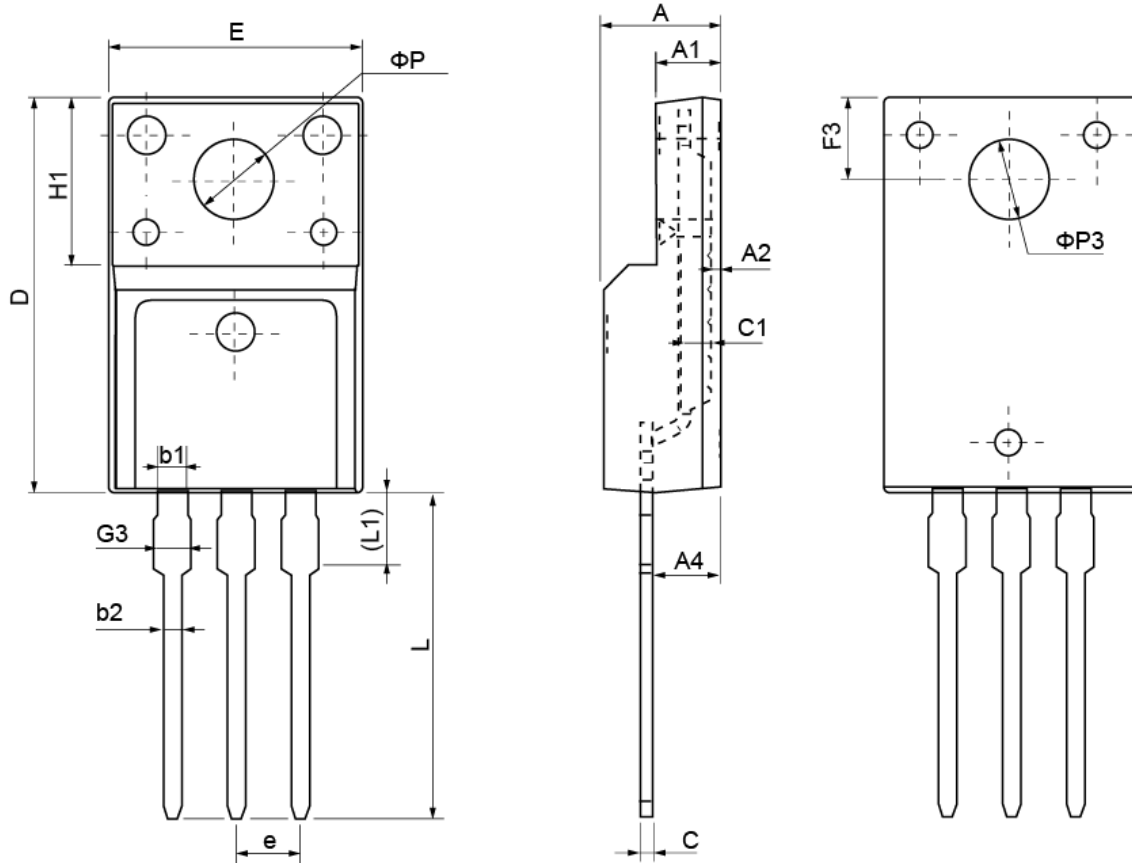


Figure 9 Normalized Maximum Transient Thermal Impedance

TO-220F Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	4.40	4.70	5.00	H1	6.70 REF		
A1	2.30	2.55	2.80	L	12.30	12.98	13.30
A2	0.30	0.50	0.70	L1	2.95	3.10	3.50
A4	2.45	2.80	3.05	phi P	3.03	3.20	3.50
c	0.30	0.50	0.70	phi P3	3.15	3.45	3.65
c1	1.20	1.30	1.40	b1	1.10	1.30	1.45
D	15.40	15.90	16.40	b2	0.60	0.80	1.00
E	9.86	10.16	10.46	F3	3.05	3.30	3.55
e	2.54 BSC			G3	1.15	1.35	1.55