

Features

- Advanced Shield Gate Trench technology
- Super Low Gate Charge
- Extremely low switching loss
- 100% EAS Guaranteed
- Green Device Available

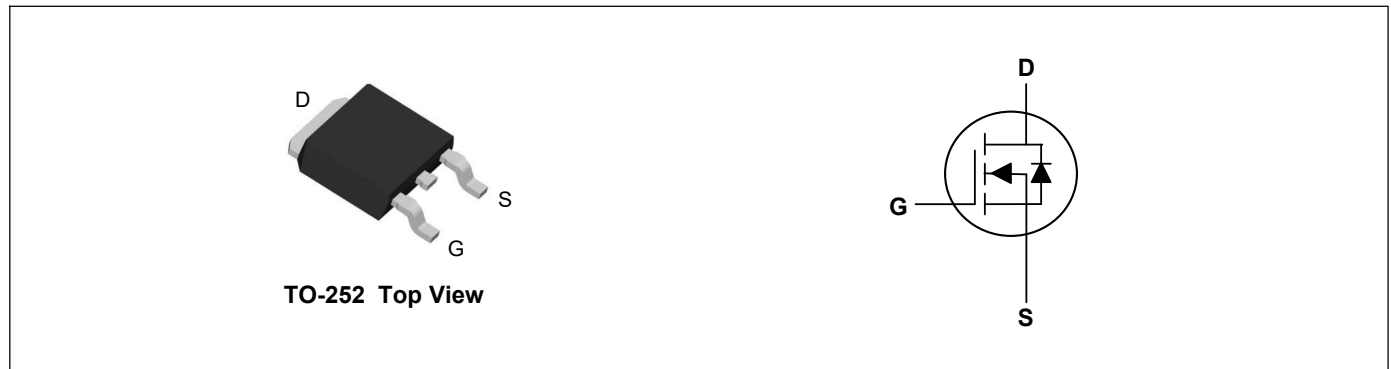
Applications

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

Product Summary



V_{DS}	100	V
I_D	12	A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	125	m Ω
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	145	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	V
Continuous Drain Current ¹	I_D	12	A
Pulsed Drain Current ²	I_{DM}	24	A
Single Pulse Avalanche Energy ³	EAS	1.2	mJ
Total Power Dissipation ⁴	P_D	17	W
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 ¹	$R_{\theta JA}$	---	62	$^\circ C/W$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	---	7.4	$^\circ C/W$

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	100	---	---	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =5A	---	105	125	mΩ
		V _{GS} =4.5V, I _D =3A	---	115	145	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250uA	1.2	1.5	2.5	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V, T _J =25°C	---	---	1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
Total Gate Charge	Q _g	V _{DS} =50V, V _{GS} =10V, I _D =5A	---	4.3	---	nC
Gate-Source Charge	Q _{gs}		---	1.5	---	
Gate-Drain Charge	Q _{gd}		---	1.1	---	
Gate plateau voltage	V _{plateau}		---	5	---	V
Turn-On Delay Time	T _{d(on)}	V _{DD} =50V, I _D =5A, V _{GS} =10V, R _G =2Ω	---	14.7	---	ns
Rise Time	T _r		---	3.5	---	
Turn-Off Delay Time	T _{d(off)}		---	21	---	
Fall Time	T _f		---	2.7	---	
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f=1MHz	---	206	---	pF
Output Capacitance	C _{oss}		---	29	---	
Reverse Transfer Capacitance	C _{rss}		---	1.4	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current ^{1,5}	I _S	V _{GS} =V _{th}	---	---	7	A
Pulsed Source Current ²	I _{SM}		---	---	21	A
Diode Forward Voltage ²	V _{SD}	V _{GS} =0V, I _S =7A, T _J =25°C	---	---	1.0	V
Reverse Recovery Time	t _{rr}	I _F =5A, di/dt=100A/μs, T _J =25°C	---	32	---	nS
Reverse Recovery Charge	Q _{rr}		---	39	---	nC
Peak Reverse Recovery Current	I _{rrm}		---	2.1	---	A

Note:

- The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
- The EAS data shows Max. rating. The test condition is V_{DD}=50V, V_{GS}=10V, L=0.3mH
- The power dissipation is limited by 150°C junction temperature
- The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

Typical Characteristics

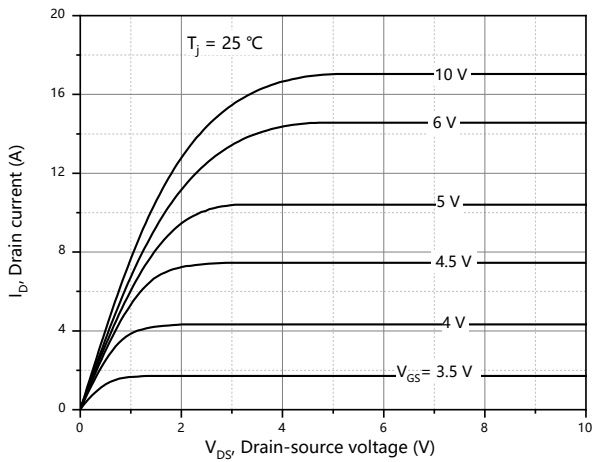


Figure 1, Typ. output characteristics

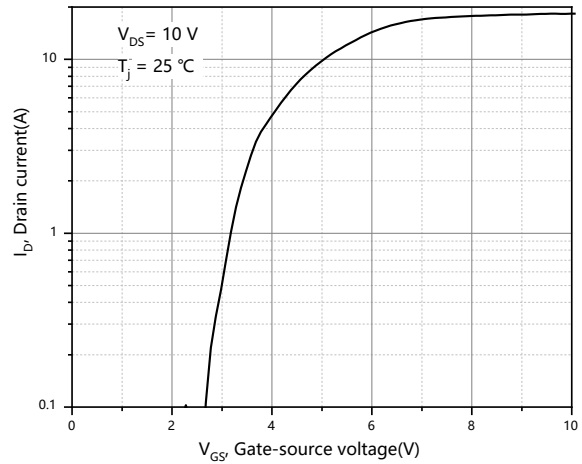


Figure 2, Typ. transfer characteristics

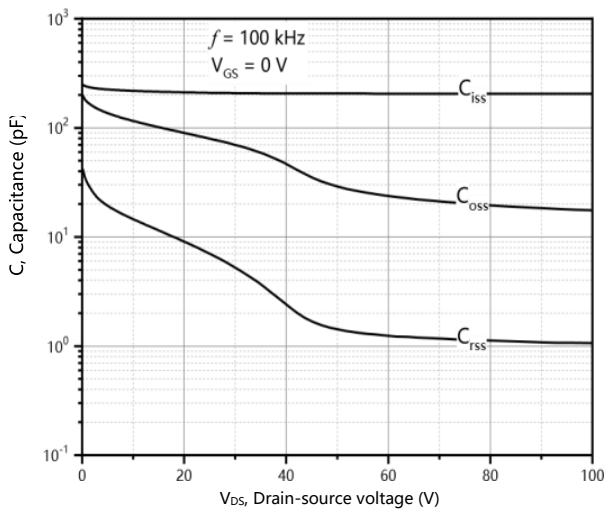


Figure 3, Typ. capacitances

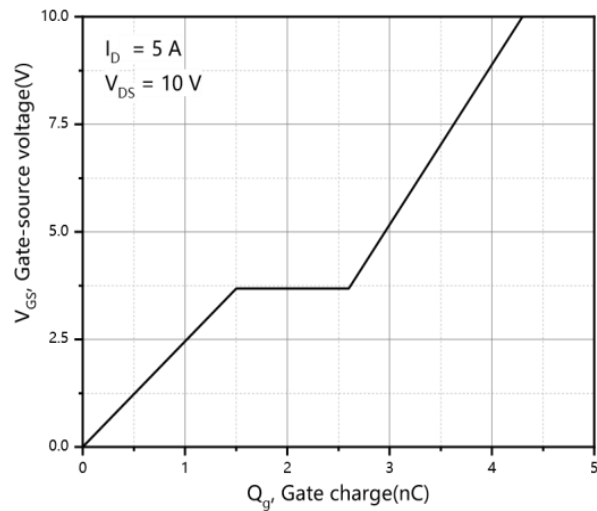


Figure 4, Typ. gate charge

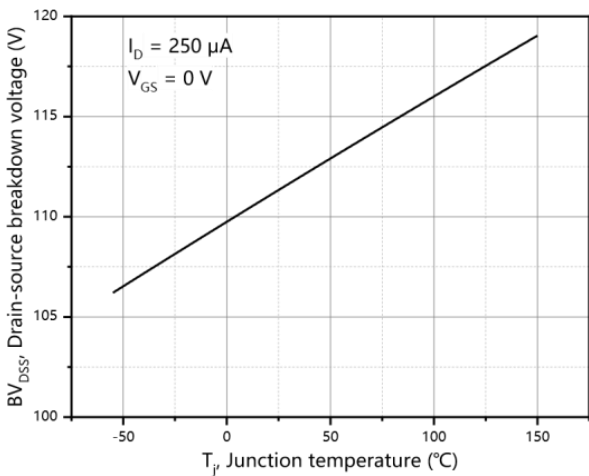


Figure 5, Drain-source breakdown voltage

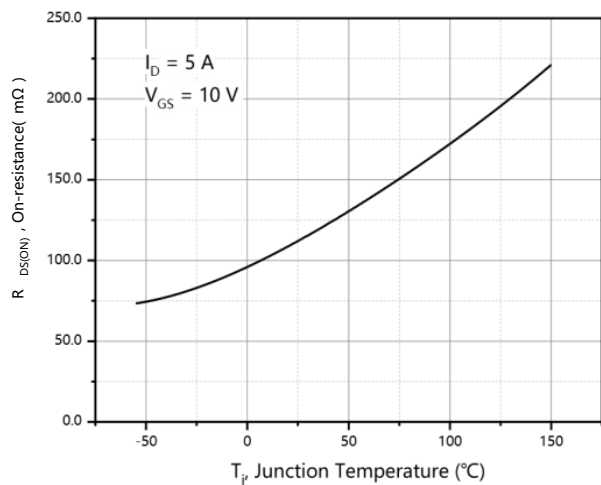


Figure 6, Drain-source on-state resistance

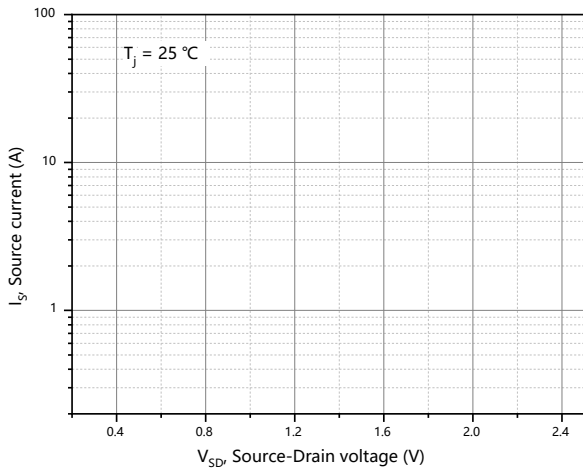


Figure 7, Forward characteristic of body diode

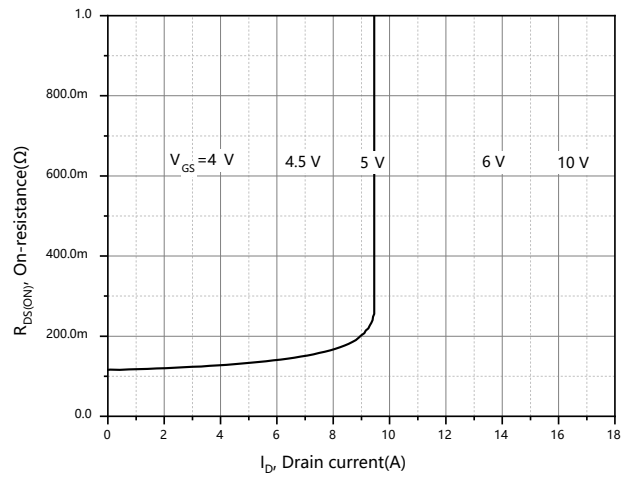


Figure 8, Drain-source on-state resistance

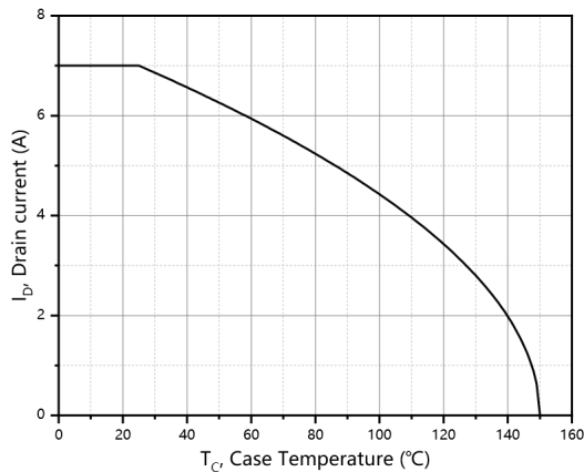


Figure 9, Drain current

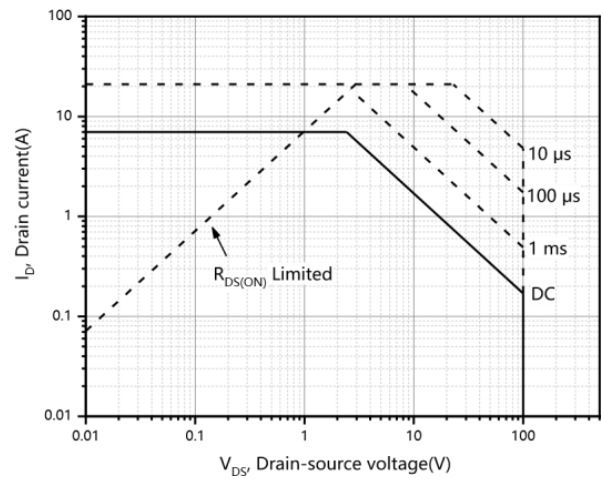
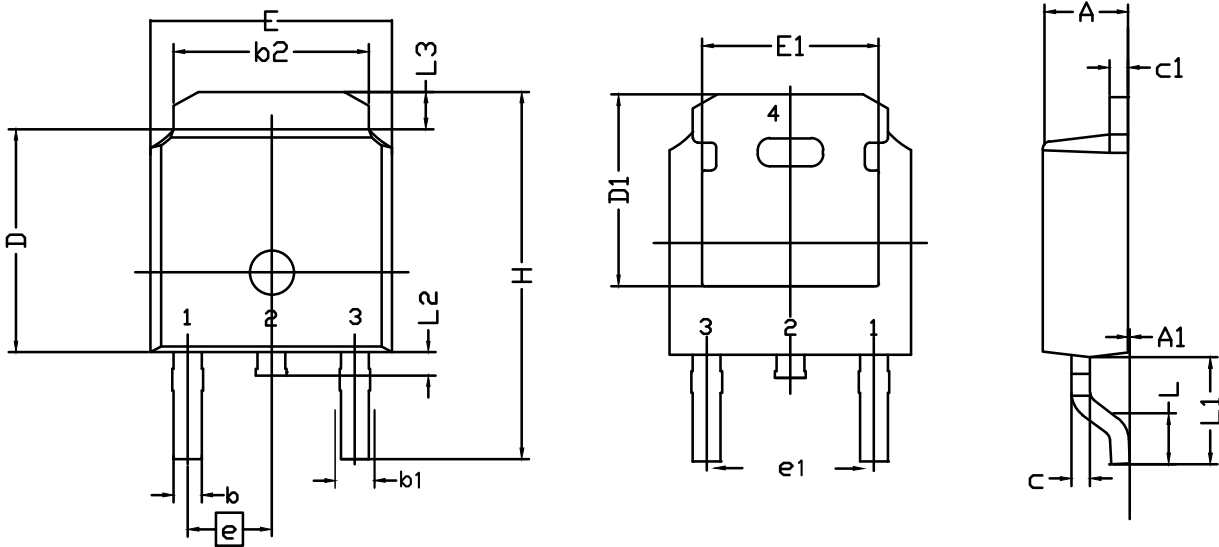


Figure 10, Safe operation area $T_C=25\text{ °C}$

TO-252 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	2.20	2.30	2.38	E	6.40	6.60	6.731
A ₁	0.00	0.10	0.20	E ₁	4.40	--	--
b	0.64	0.76	0.89	e	2.286 BSC		
b ₁	0.77	0.85	1.14	e ₁	4.572 BSC		
b ₂	5.00	5.33	5.46	H	9.40	10.00	10.40
c	0.458	0.508	0.610	L	1.40	1.52	1.77
C ₁	0.458	0.508	0.620	L ₁	--	2.743	--
D	5.98	6.10	6.223	L ₂	0.60	0.80	1.01
D ₁	5.20	5.25	5.38	L ₃	0.90	1.06	1.25