

Features

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

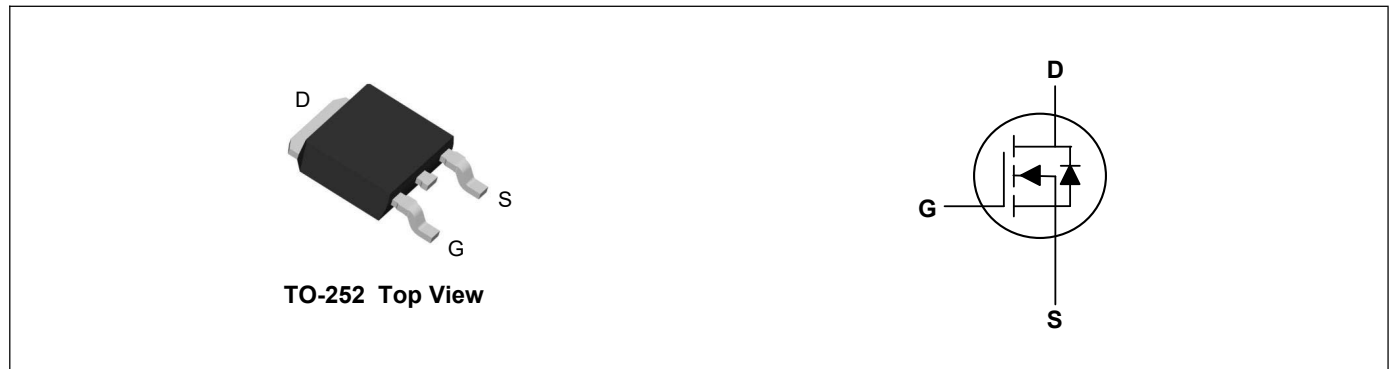
Product Summary



V_{DS}	40	V
I_D	120	A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	3.4	m Ω
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	5.2	m Ω

Applications

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



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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹	I_D	120	A
Pulsed Drain Current ²	I_{DM}	480	A
Single Pulse Avalanche Energy ³	E_{AS}	141	mJ
Total Power Dissipation ⁴	P_D	96	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	$R_{\theta JA}$	---	56	$^{\circ}C/W$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	---	1.3	$^{\circ}C/W$

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	40	---	---	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A	---	2.8	3.4	mΩ
		V _{GS} =4.5V, I _D =15A	---	3.8	5.2	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250μA	1.0	---	2.5	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V, T _J =25°C	---	---	1	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
Forward Transconductance	g _{fs}	V _{DS} =10V, I _D =20A	---	100	---	S
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =10V, I _D =20A	---	95	---	nC
Gate-Source Charge	Q _{gs}		---	9.5	---	
Gate-Drain Charge	Q _{gd}		---	18.5	---	
Turn-On Delay Time	T _{d(on)}	V _{DD} =20V, R _G =3Ω, V _{GS} =10V, I _D =20A	---	15.8	---	ns
Rise Time	T _r		---	30.5	---	
Turn-Off Delay Time	T _{d(off)}		---	150	---	
Fall Time	T _f		---	82	---	
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =10V, f=1MHz	---	5210	---	pF
Output Capacitance	C _{oss}		---	430	---	
Reverse Transfer Capacitance	C _{rss}		---	325	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current ²	I _S		---	---	120	A
Diode Forward Voltage ¹	V _{SD}	V _{GS} =0V, I _S =20A, T _J =25°C	---	---	1.2	V
Reverse Recovery Time	t _{rr}	I _F =20A, V _{GS} =0V, di _F /dt=100A/μs	---	32	---	nS
Reverse Recovery Charge	Q _{rr}		---	19.2	---	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 ≤ 300μs, 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 175°C junction temperature

Typical Characteristics

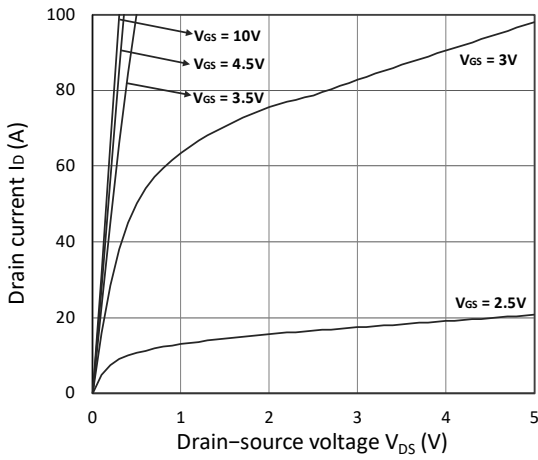


Figure 1. Output Characteristics

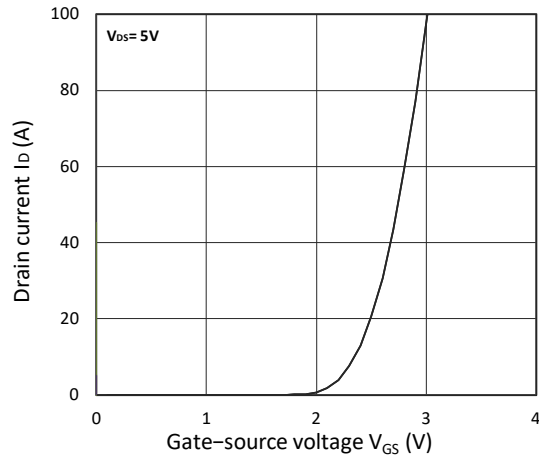


Figure 2. Transfer Characteristics

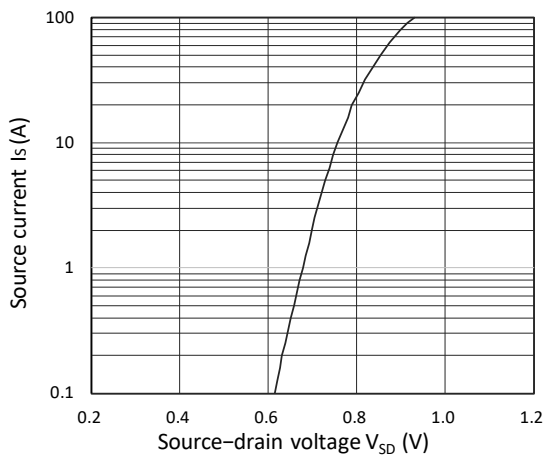


Figure 3. Forward Characteristics of Reverse

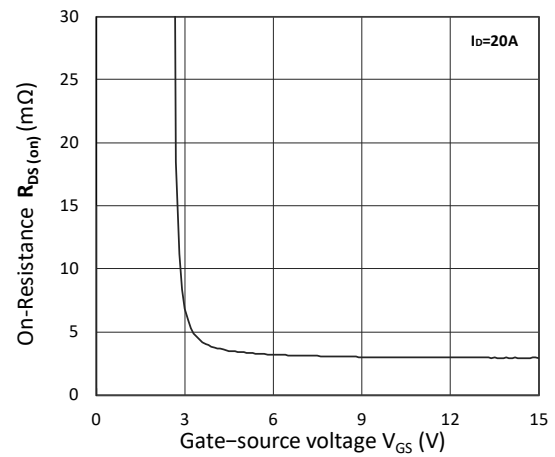


Figure 4. $R_{DS(on)}$ vs. V_{GS}

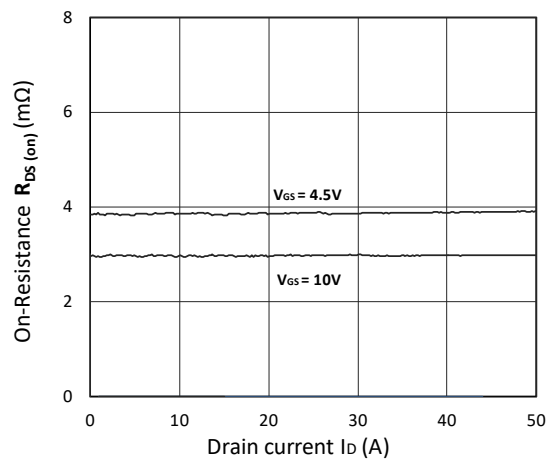


Figure 5. $R_{DS(on)}$ vs. I_D

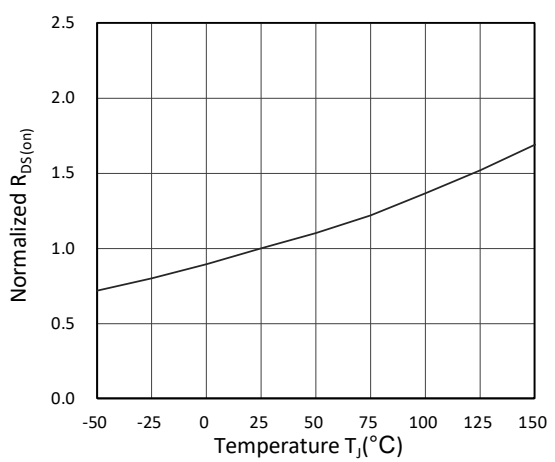


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

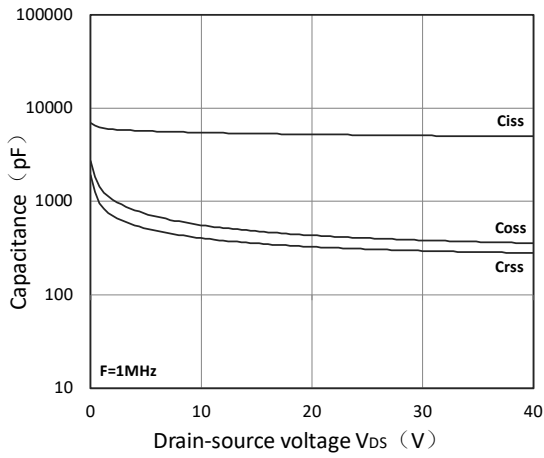


Figure 7. Capacitance Characteristics

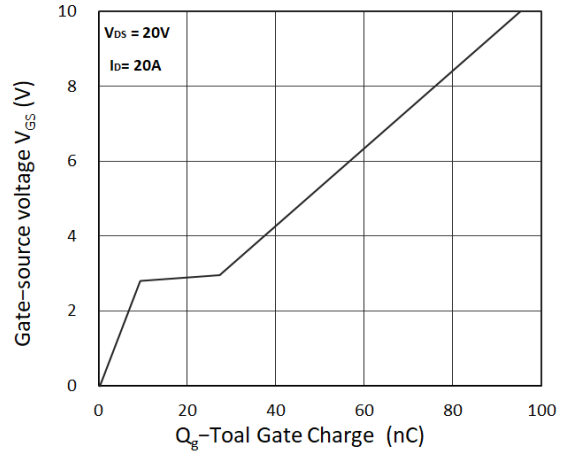


Figure 8. Gate Charge Characteristics

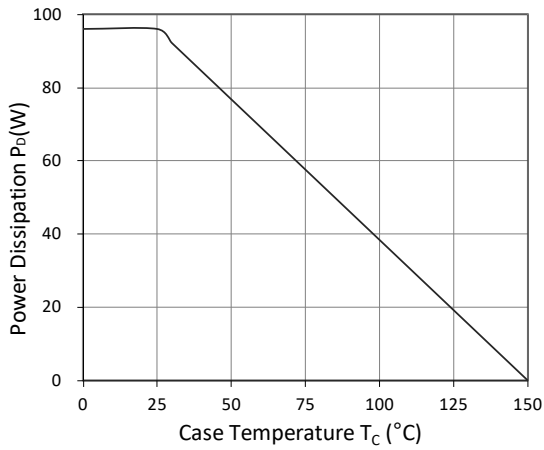


Figure 9. Power Dissipation

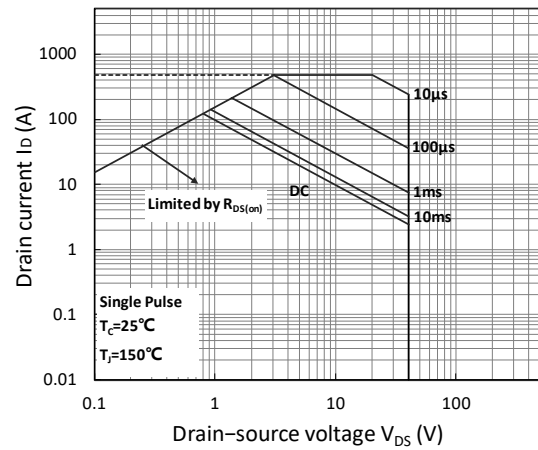


Figure 10. Safe Operating Area

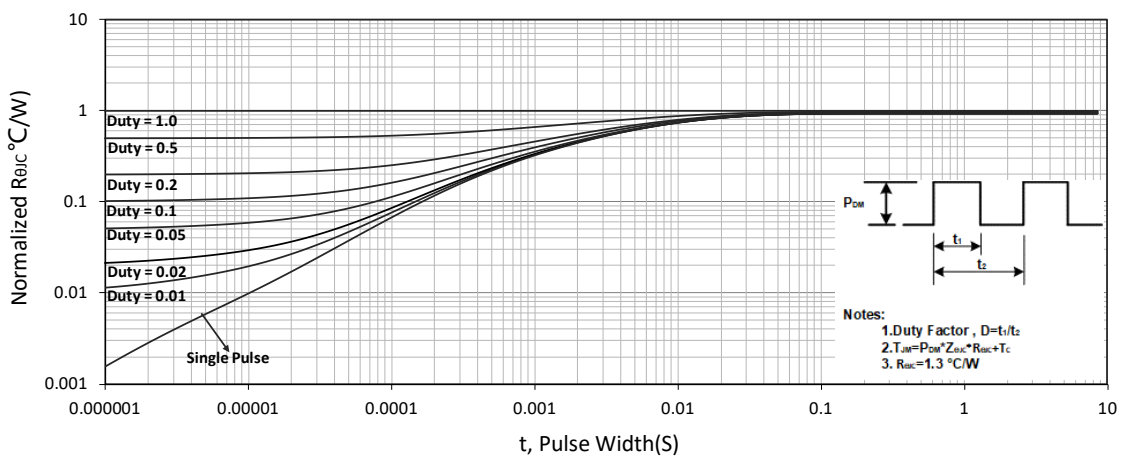
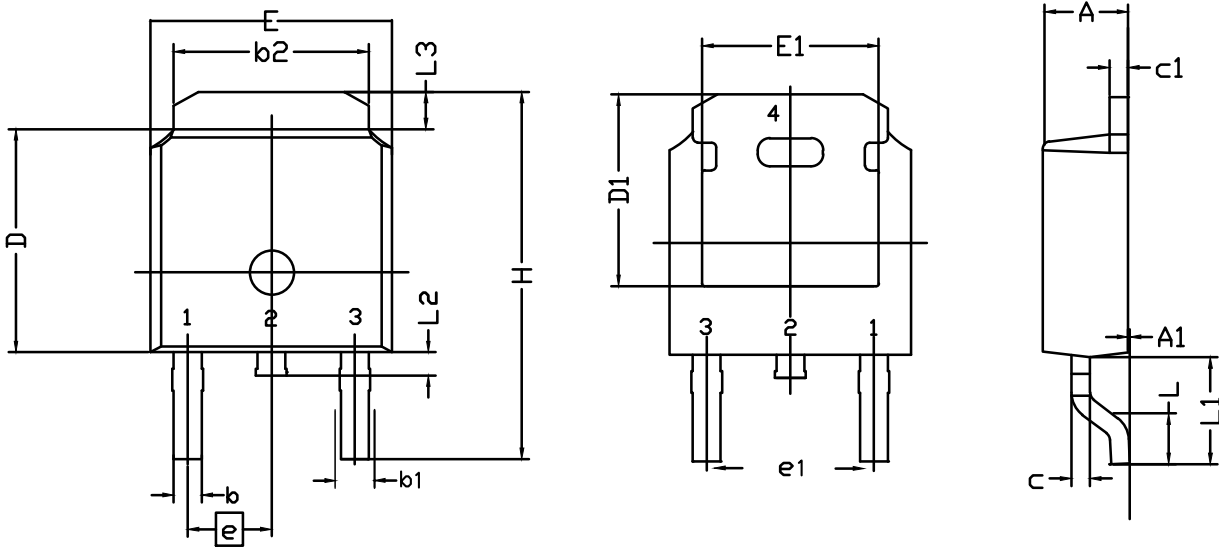


Figure 11. Normalized Maximum Transient Thermal Impedance

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
A₁	0.00	0.10	0.20	E₁	4.40	--	--
b	0.64	0.76	0.89	e	2.286 BSC		
b₁	0.77	0.85	1.14	e₁	4.572 BSC		
b₂	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
C₁	0.458	0.508	0.620	L₁	--	2.743	--
D	5.98	6.10	6.223	L₂	0.60	0.80	1.01
D₁	5.20	5.25	5.38	L₃	0.90	1.06	1.25