

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
- Networking DC-DC Power System
- Load Switch

Product Summary



V_{DS}	60	V
I_D	42	A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	17	m Ω
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	19.5	m Ω



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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹	$I_D@T_C=25^\circ C$	42	A
Continuous Drain Current ¹	$I_D@T_C=100^\circ C$	26	A
Pulsed Drain Current ²	I_{DM}	104	A
Single Pulse Avalanche Energy ³	E_{AS}	26	mJ
Avalanche Current	I_{AS}	23	A
Total Power Dissipation ⁴	$P_D@T_C=25^\circ C$	54	W
Total Power Dissipation ⁴	$P_D@T_C=100^\circ C$	22	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	$R_{\theta JA}$	---	55	$^\circ C/W$
Thermal Resistance Junction-Case	$R_{\theta JC}$	---	2.3	$^\circ C/W$

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 =250uA	60	---	---	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =6A	---	14	17	mΩ
		V _{GS} =10V, I _D =5A	---	15	19.5	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250uA	1	1.5	2.5	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =48V, 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 =3A	---	16	---	S
Gate Resistance	R _g	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	1.2	---	Ω
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =10V, I _D =6A	---	52	---	nC
Gate-Source Charge	Q _{gs}		---	10	---	
Gate-Drain Charge	Q _{gd}		---	8	---	
Turn-On Delay Time	T _{d(on)}	V _{DS} =30V, V _{GS} =10V, R _G =6Ω, I _D =1A	---	9	---	ns
Rise Time	T _r		---	18	---	
Turn-Off Delay Time	T _{d(off)}		---	40	---	
Fall Time	T _f		---	30	---	
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f=1MHz	---	2170	---	pF
Output Capacitance	C _{oss}		---	112	---	
Reverse Transfer Capacitance	C _{rss}		---	87	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode Forward Voltage ²	V _{SD}	V _{GS} =0V, I _S =1A	---	0.7	1.1	V
Reverse Recovery Time	t _{rr}	I _F =1A, V _R =0V di/dt=100A/μs, T _J =25°C	---	18	---	nS
Reverse Recovery Charge	Q _{rr}		---	11.5	---	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.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°C junction temperature

Typical Characteristics

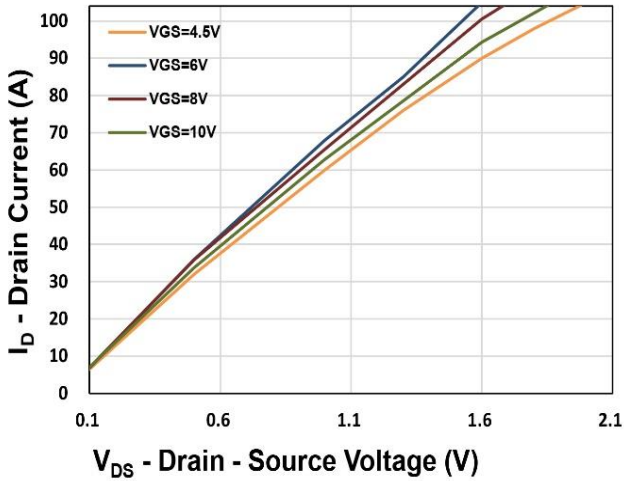


Figure 1. Output Characteristics

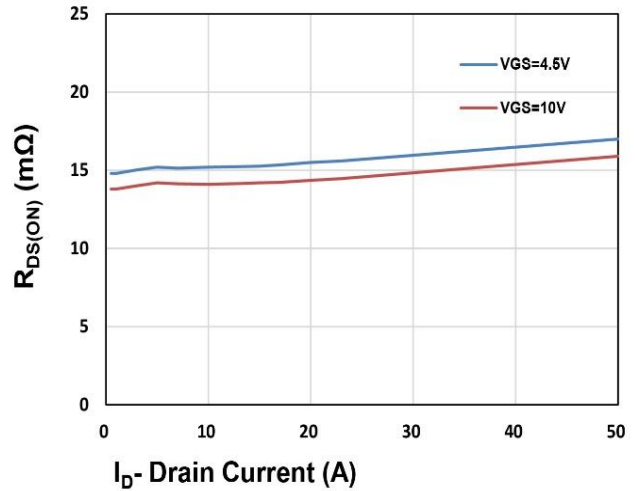


Figure 2. On-Resistance vs. ID

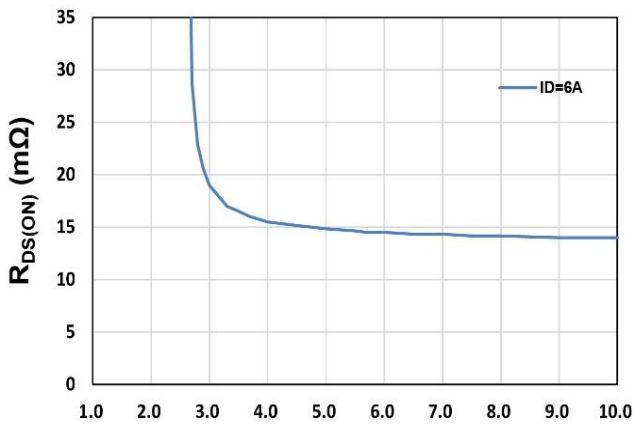


Figure 3. On-Resistance vs. VGS

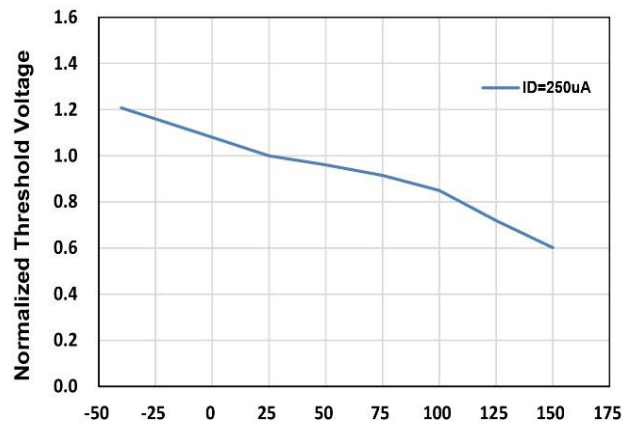


Figure 4. Gate Threshold Voltage

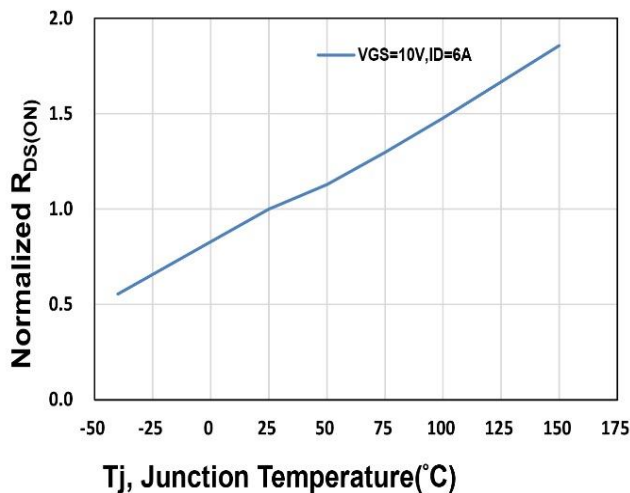


Figure 5. Drain-Source On Resistance

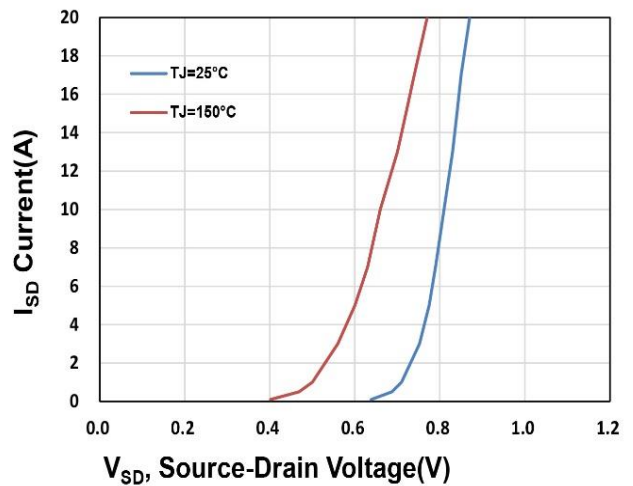
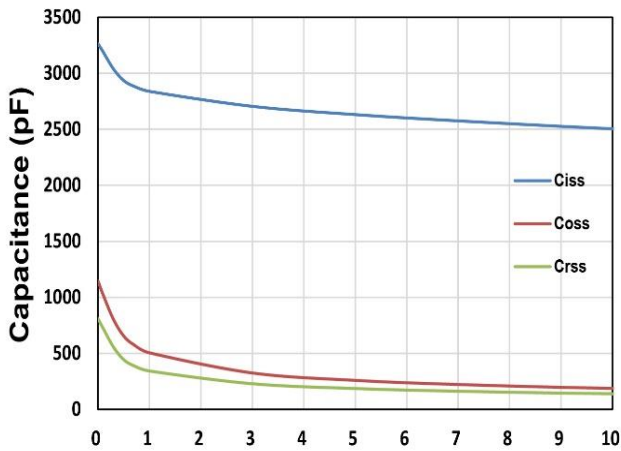
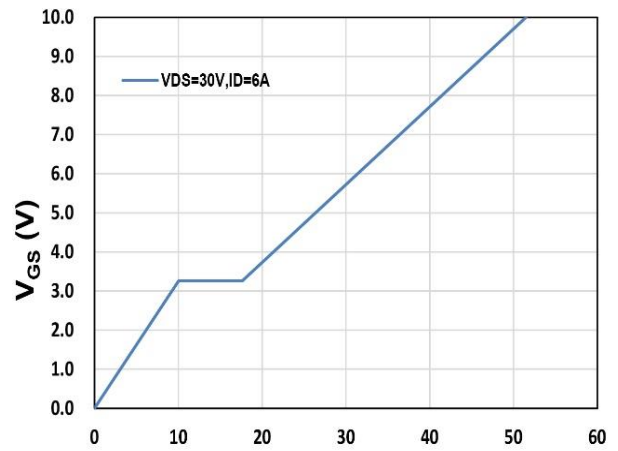


Figure 6. Source-Drain Diode Forward



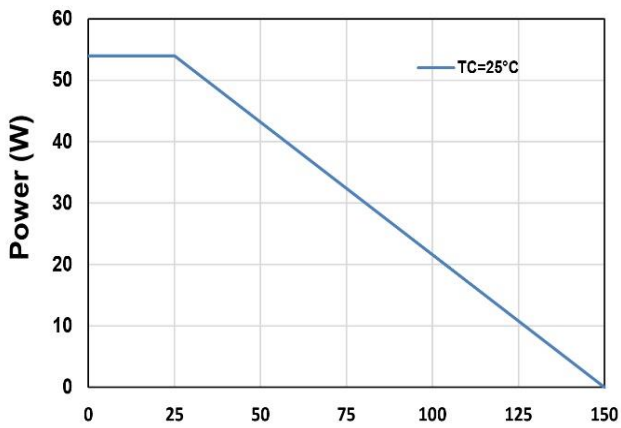
V_{DS} - Drain - Source Voltage (V)

Figure 7. Capacitance



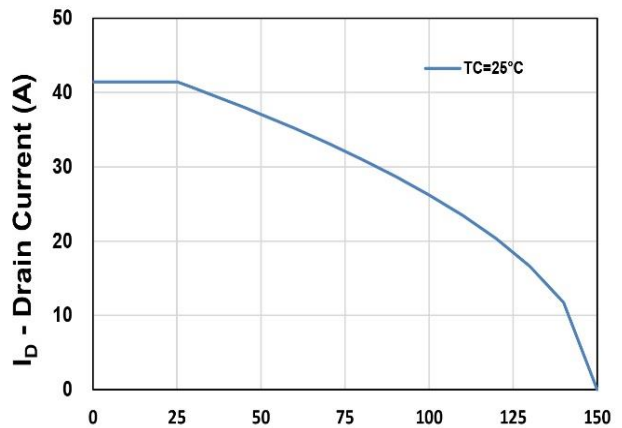
Qg, Total Gate Charge (nC)

Figure 8. Gate Charge Characteristics



Tj - Junction Temperature (°C)

Figure 9. Power Dissipation



Tj - Junction Temperature (°C)

Figure 10. Drain Current

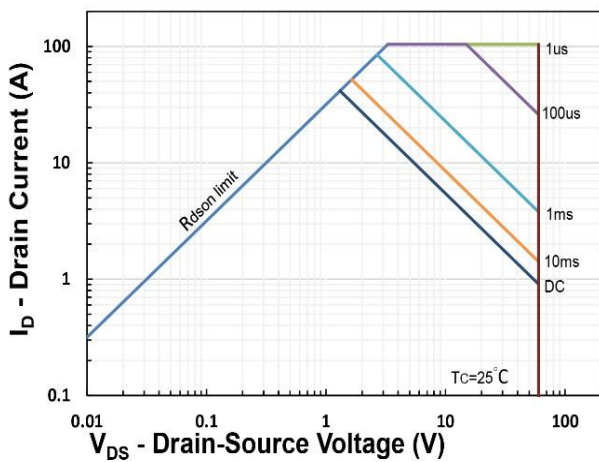


Figure 11. Safe Operating Area

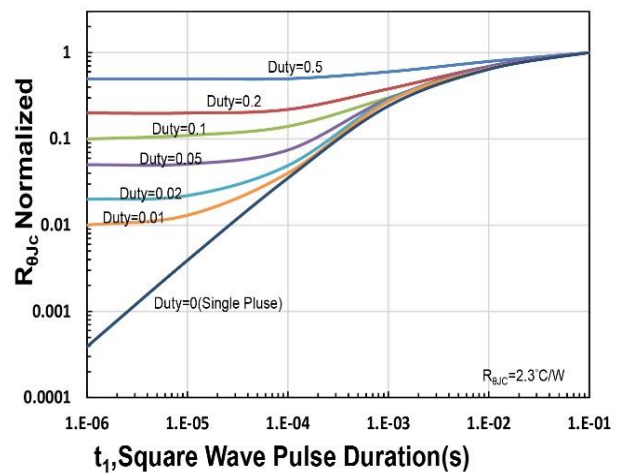
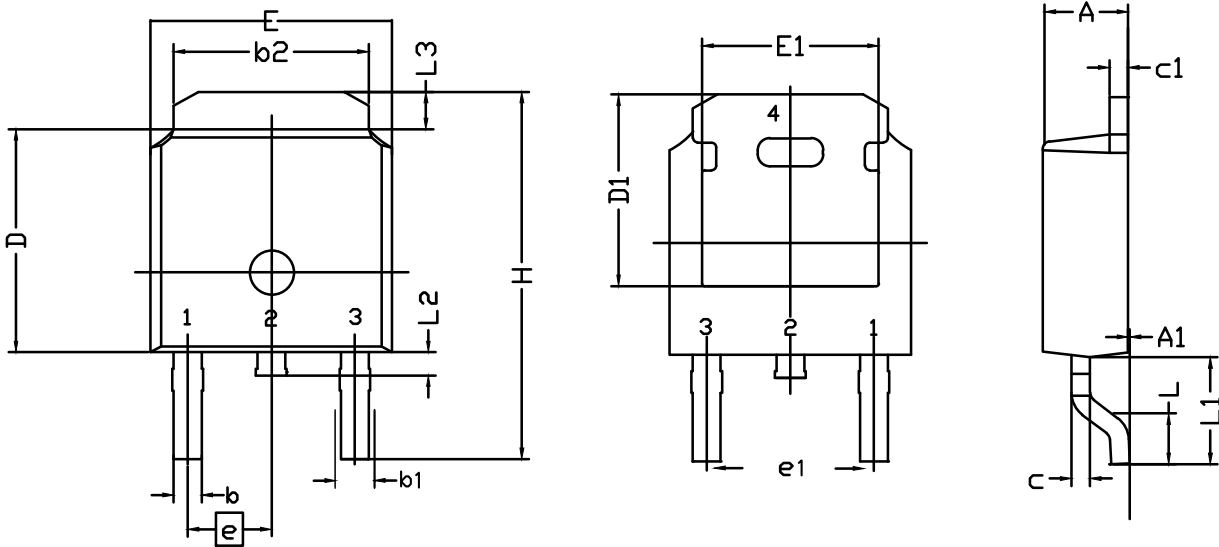


Figure 12. R_{θJc} Transient Thermal Impedance

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