

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}	75	V
I_D	60	A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	8.5	m Ω



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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	75	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹	$I_D@T_C=25^\circ\text{C}$	60	A
Continuous Drain Current ¹	$I_D@T_C=100^\circ\text{C}$	42	A
Pulsed Drain Current ²	I_{DM}	310	A
Single Pulse Avalanche Energy ³	EAS	300	mJ
Peak diode recovery voltage	dv/dt	30	V/ns
Total Power Dissipation ⁴	P_D	140	W
Storage Temperature Range	T_{STG}	-55 to 175	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to 175	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	---	50	$^\circ\text{C/W}$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	---	1.05	$^\circ\text{C/W}$

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	75	84	---	V
Static Drain-Source On-Resistance ²	R _{DS(ON)}	V _{GS} =10V, I _D =30A	---	6.8	8.5	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250uA	2	3	4	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =75V, V _{GS} =0V, T _C =25°C	---	---	1	uA
		V _{DS} =75V, V _{GS} =0V, T _C =125°C	---	---	10	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	---	66	---	S
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =10V, I _D =30A	---	100	---	nC
Gate-Source Charge	Q _{gs}		---	20	---	
Gate-Drain Charge	Q _{gd}		---	30	---	
Turn-On Delay Time	T _{d(on)}	V _{DD} =30V, V _{GS} =10V, R _G =2.5Ω, I _D =2A, R _L =15Ω	---	17.8	---	ns
Rise Time	T _r		---	11.8	---	
Turn-Off Delay Time	T _{d(off)}		---	56	---	
Fall Time	T _f		---	14.6	---	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	4400	---	pF
Output Capacitance	C _{oss}		---	340	---	
Reverse Transfer Capacitance	C _{rss}		---	260	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current ^{1,4}	I _S		---	---	80	A
Pulsed Source Current ^{2,4}	I _{SM}		---	---	320	A
Diode Forward Voltage ²	V _{SD}	V _{GS} =0V, I _S =30A, T _J =25°C	---	---	1.2	V
Reverse Recovery Time	t _{rr}	I _F =75A, di/dt=100A/μs, T _J =25°C	---	---	36	nS
Reverse Recovery Charge	Q _{rr}		---	---	56	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}=37.5V, V_{GS}=10V, L=0.5mH
4. The power dissipation is limited by 175°C junction temperature

Typical Characteristics

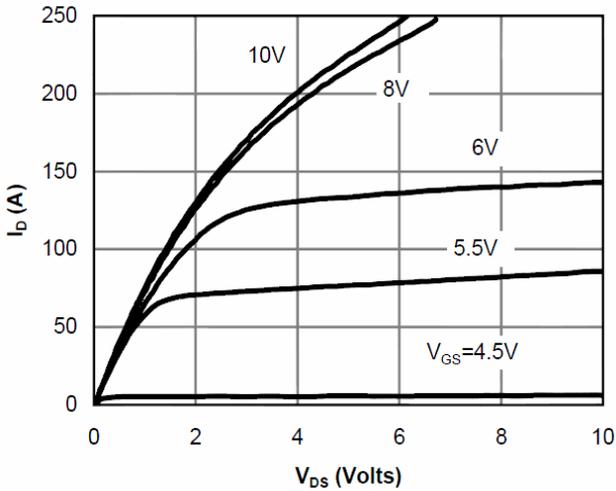


Figure1. Output characteristics

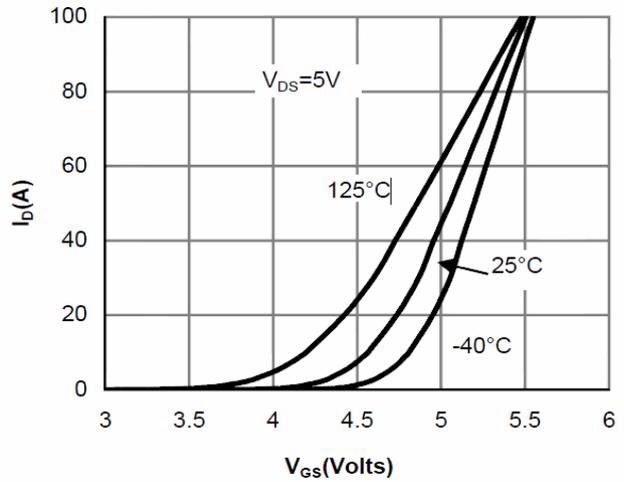


Figure2. Transfer characteristics

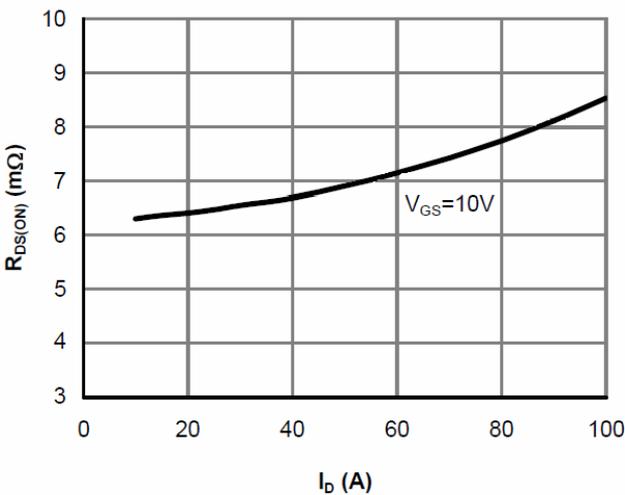


Figure3. Static drain-source on resistance

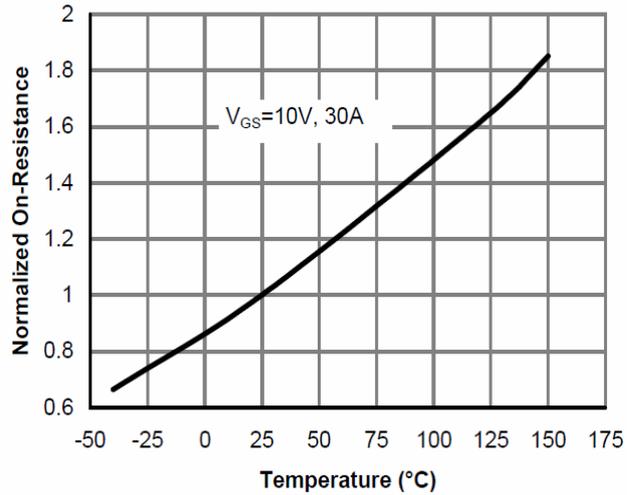


Figure4. $R_{DS(ON)}$ vs Junction Temperature

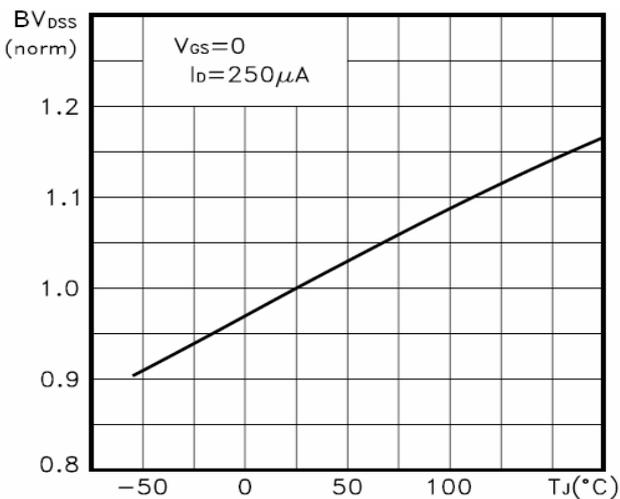


Figure5. BV_{DSS} vs Junction Temperature

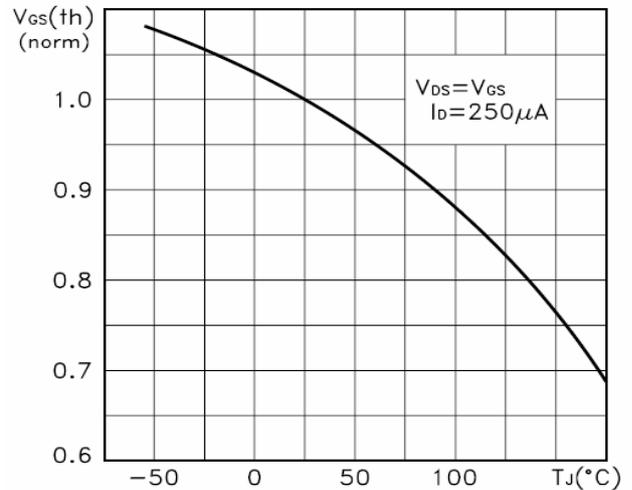


Figure6. $V_{GS(th)}$ vs Junction Temperature

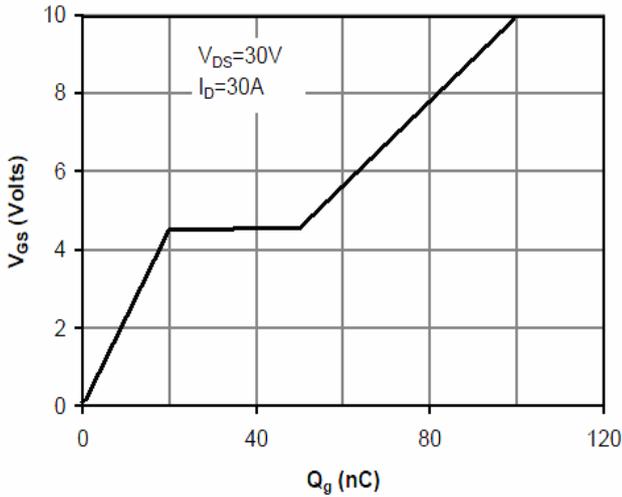


Figure7. Gate charge waveforms

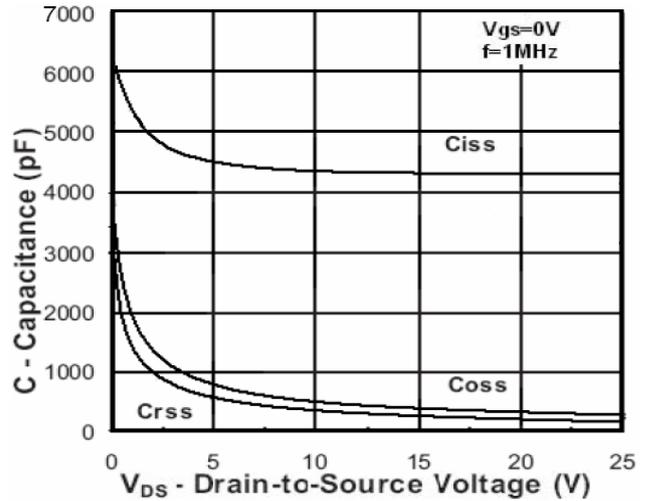


Figure8. Capacitance

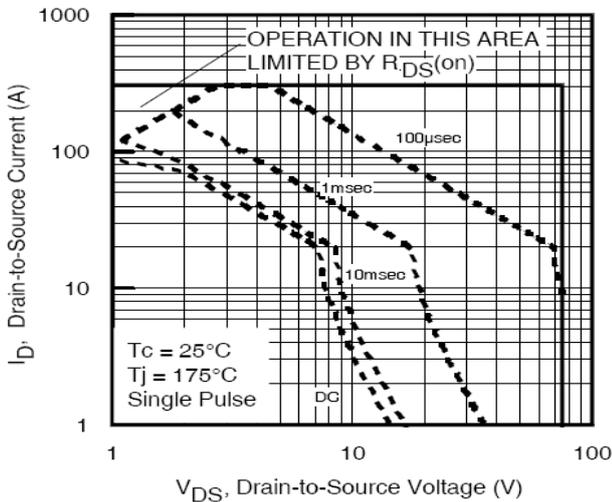


Figure9. Safe operating area

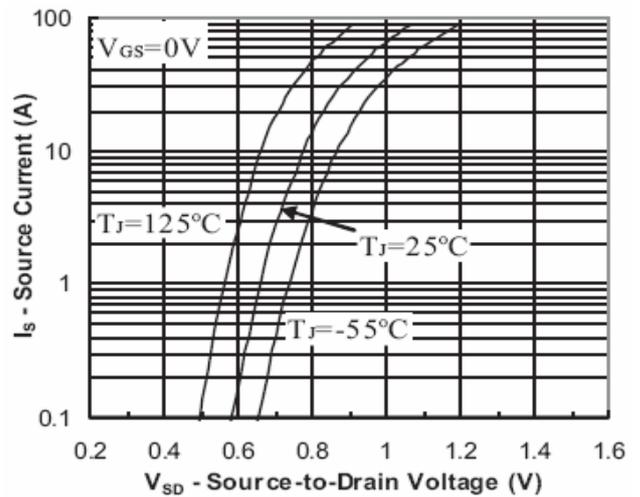


Figure10. Source-Drain Diode Forward Voltage

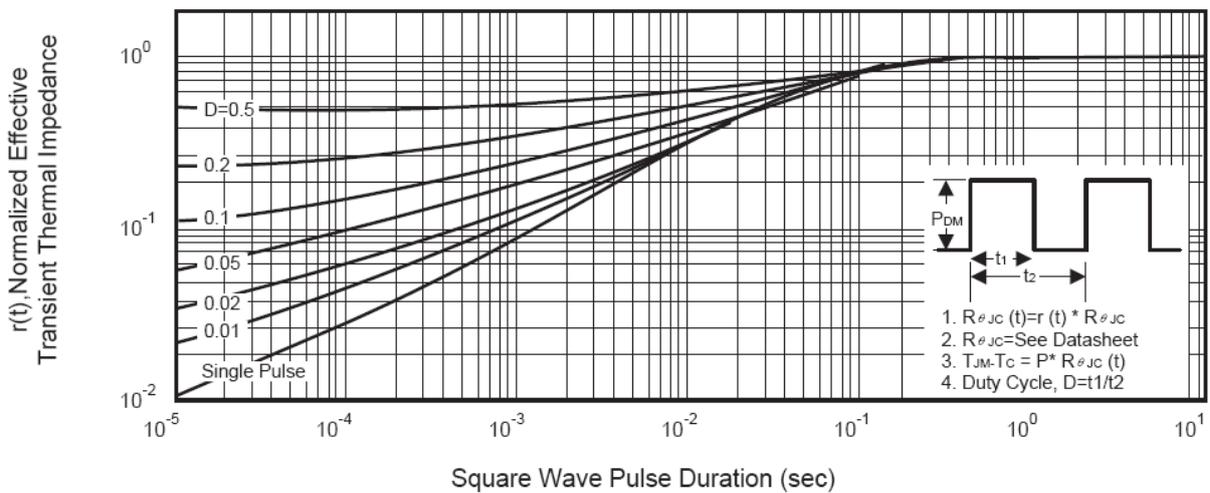
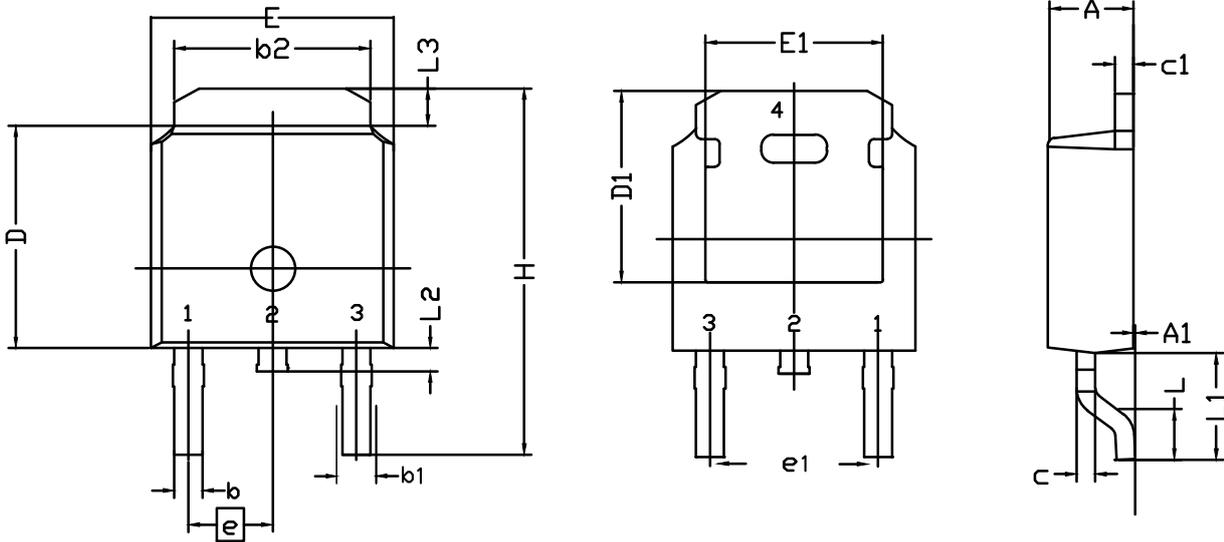


Figure11. Normalized Maximum Transient Thermal Impedance

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