



Features

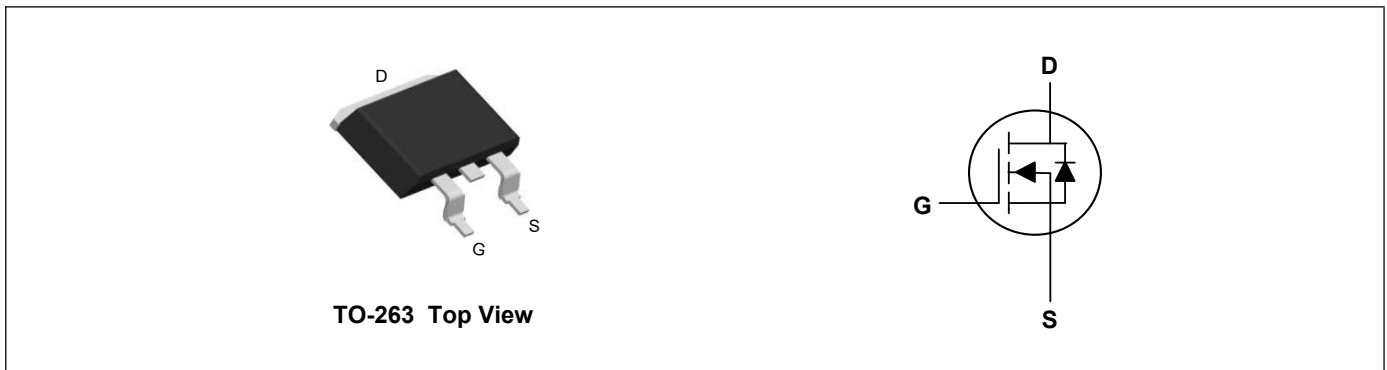
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

Product Summary

V_{DS}	60	V
I_D	160	A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	4.8	m Ω

Applications

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



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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, V_{GS} @ 10V ¹	$I_D@T_C=25^\circ\text{C}$	160	A
Continuous Drain Current, V_{GS} @ 10V ¹	$I_D@T_C=100^\circ\text{C}$	110	A
Pulsed Drain Current ²	I_{DM}	480	A
Single Pulse Avalanche Energy ³	EAS	180	mJ
Avalanche Current	I_{AS}	60	A
Total Power Dissipation ⁴	$P_D@T_C=25^\circ\text{C}$	214	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	$R_{\theta JA}$	---	62	$^\circ\text{C/W}$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	---	0.7	$^\circ\text{C/W}$

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	60	---	---	V
Static Drain-Source On-Resistance ²	R _{DS(ON)}	V _{GS} =10V, I _D =30A	---	---	4.8	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250uA	2.5	---	4.5	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =48V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =48V, V _{GS} =0V, T _J =55°C	---	---	5	
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =30A	---	50	---	S
Gate Resistance	R _g	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	1.4	---	Ω
Total Gate Charge	Q _g	V _{DS} =48V, V _{GS} =10V, I _D =15A	---	83.7	---	nC
Gate-Source Charge	Q _{gs}		---	28.6	---	
Gate-Drain Charge	Q _{gd}		---	29.3	---	
Turn-On Delay Time	T _{d(on)}	V _{DD} =30V, V _{GS} =10V, R _G =3.3Ω, I _D =48A	---	38.1	---	ns
Rise Time	T _r		---	73.3	---	
Turn-Off Delay Time	T _{d(off)}		---	51.6	---	
Fall Time	T _f		---	26.1	---	
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	5580	---	pF
Output Capacitance	C _{oss}		---	571	---	
Reverse Transfer Capacitance	C _{rss}		---	278	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current ^{1,5}	I _S	V _G =V _D =0V, Force Current	---	---	150	A
Diode Forward Voltage ²	V _{SD}	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1.2	V
Reverse Recovery Time	t _{rr}	I _F =30A, di/dt=100A/μs, T _J =25°C	---	27	---	nS
Reverse Recovery Charge	Q _{rr}		---	28	---	nC

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=0.1mH
- 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

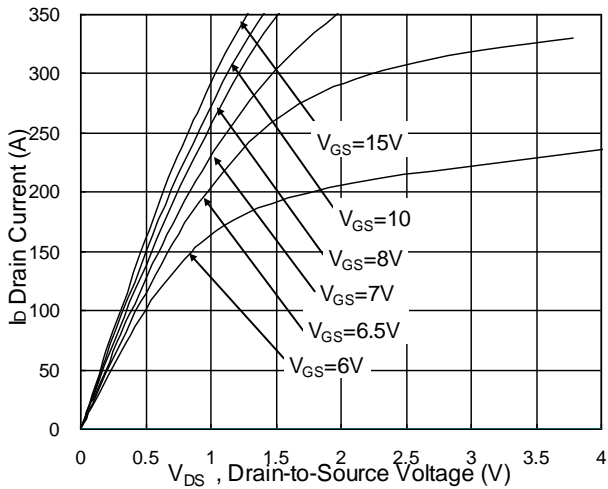


Fig.1 Typical Output Characteristics

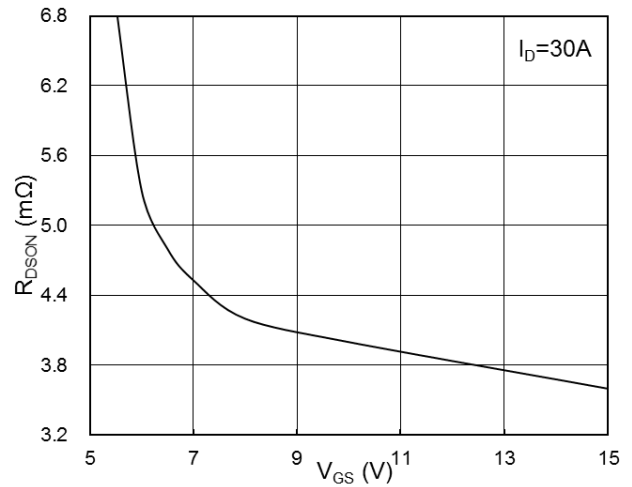


Fig.2 On-Resistance vs. G-S Voltage

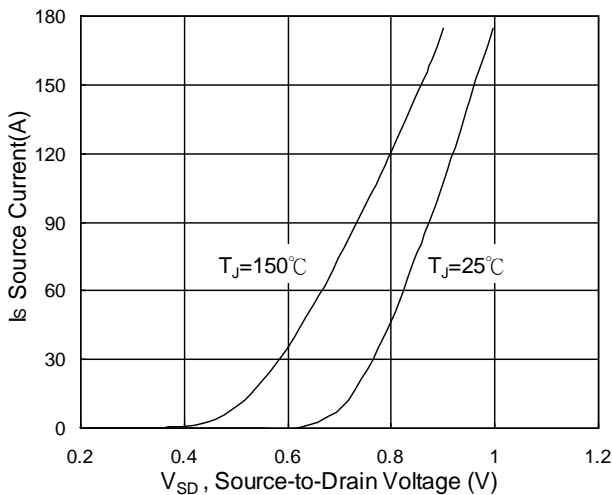


Fig.3 Source Drain Forward Characteristics

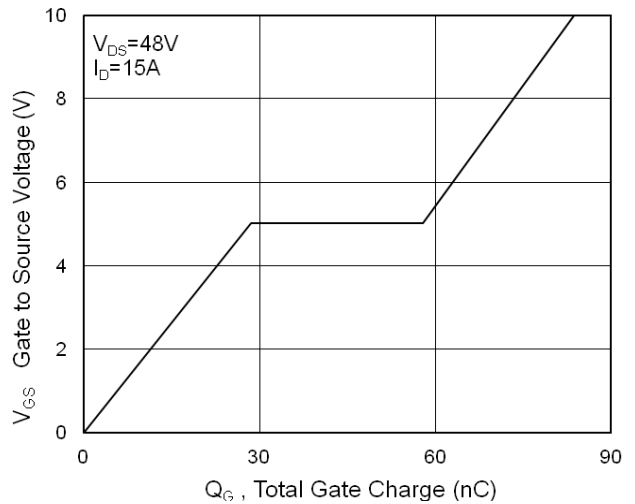


Fig.4 Gate-Charge Characteristics

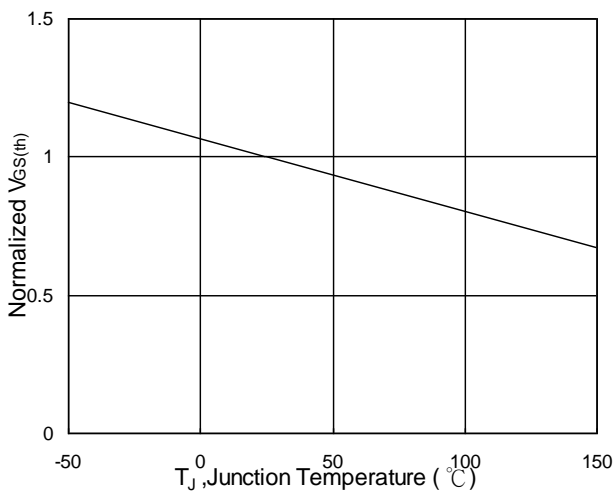


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

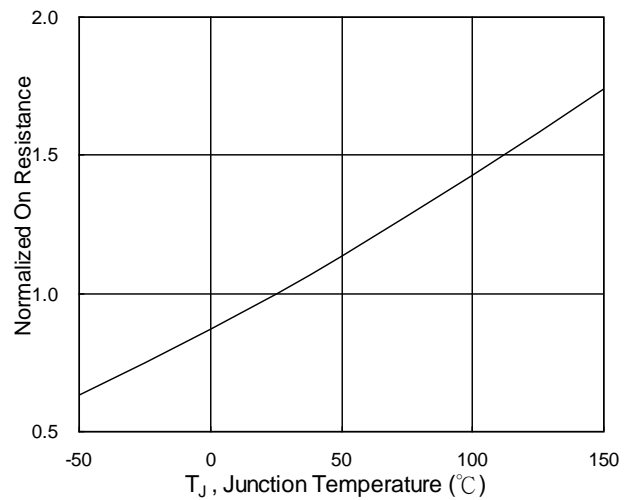


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

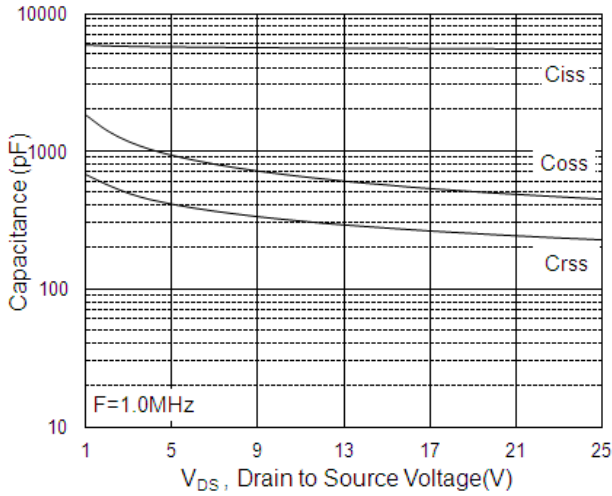


Fig.7 Capacitance

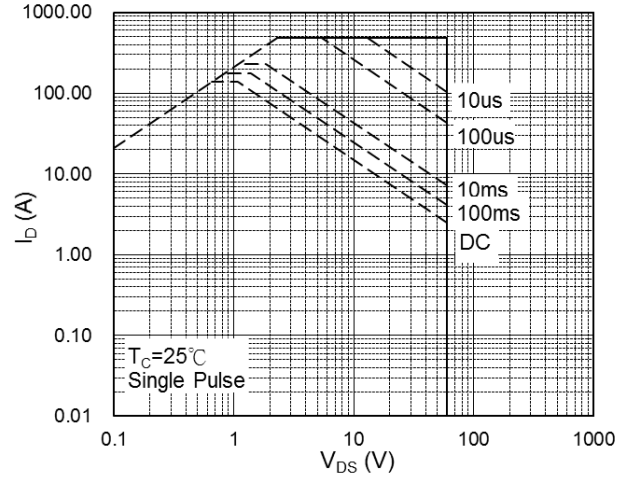


Fig.8 Safe Operating Area

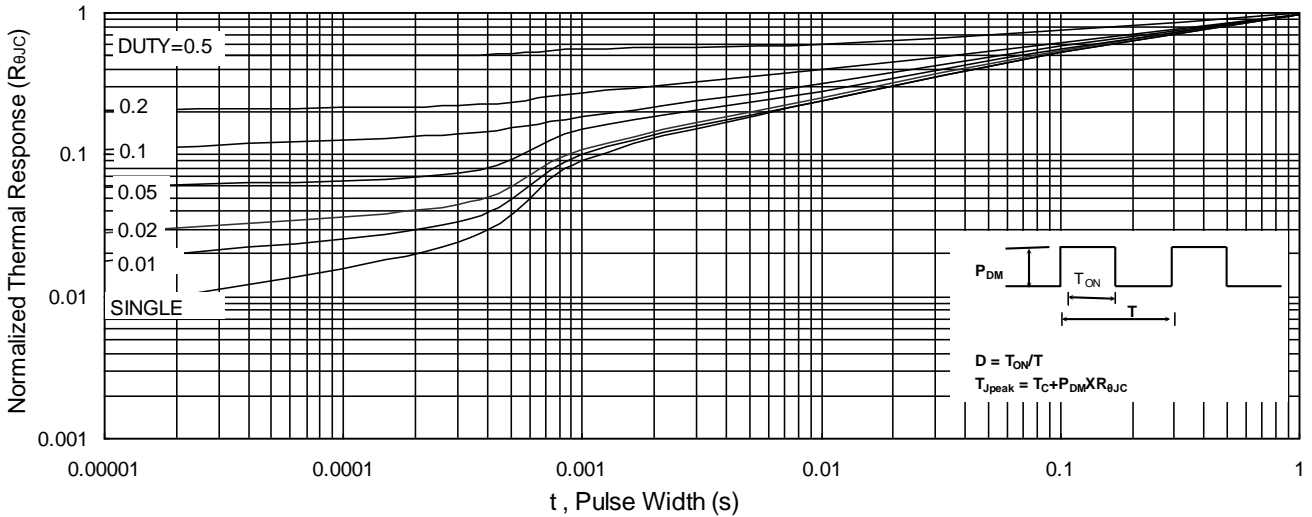


Fig.9 Normalized Maximum Transient Thermal Impedance

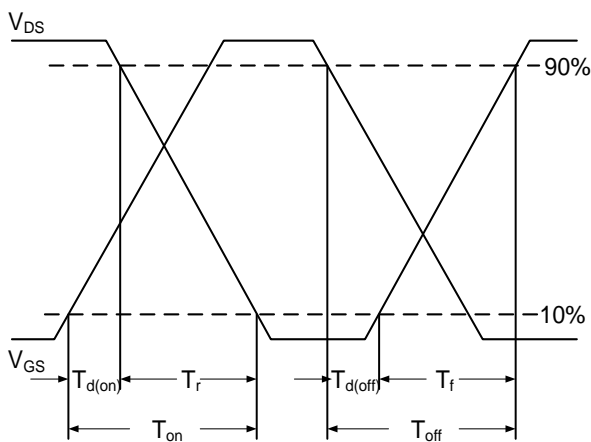


Fig.10 Switching Time Waveform

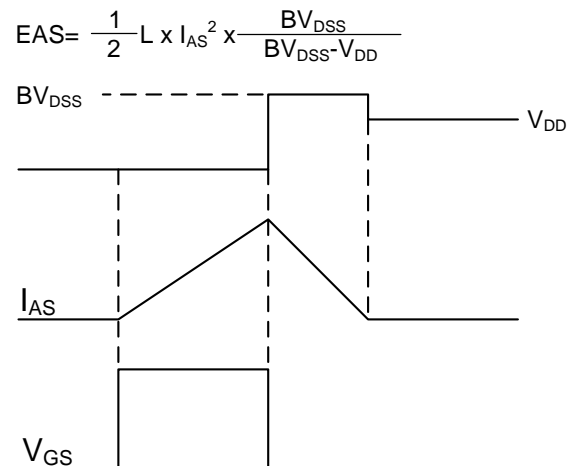
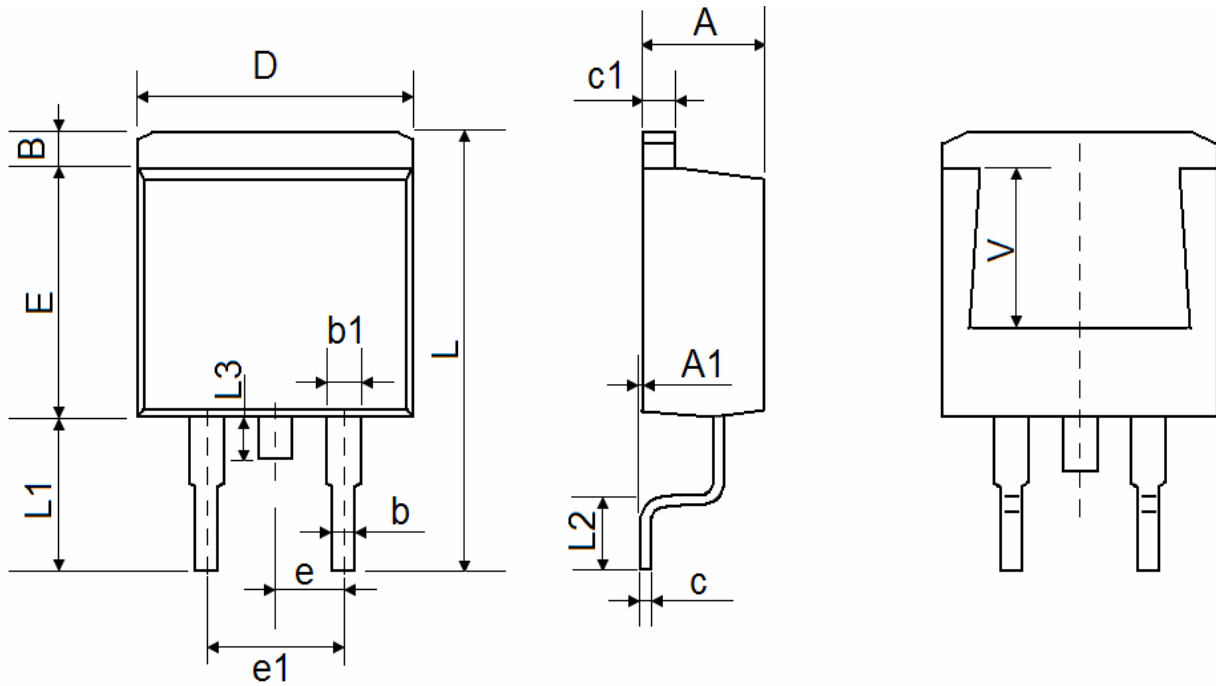


Fig.11 Unclamped Inductive Switching Waveform

TO-263 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	4.40	4.55	4.70	A1	0.00	0.07	0.15
B	1.00	1.20	1.40	b	0.65	0.80	0.95
b1	1.10	1.15	1.37	c	0.30	0.40	0.53
c1	1.10	1.25	1.37	D	9.80	10.00	10.40
E	8.50	8.80	9.20	e	2.54 REF		
e1	4.90	5.10	5.40	L	14.80	15.20	15.70
L1	5.00	5.25	5.60	L2	2.05	2.45	2.80
L3	1.20	1.50	1.80	V	5.60 REF		