

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available
- ESD: HBM $\geq 200V$, $< 400V$
CDM $> 250V$, $< 500V$

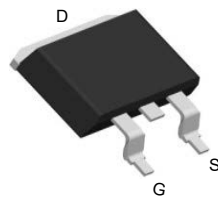
Product Summary



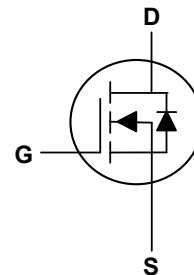
V_{DS}	60	V
I_D	70	A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	8.5	m Ω
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	12	m Ω

Applications

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



TO-263 Top View



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	$I_D@T_C=25^{\circ}C$	70	A
Continuous Drain Current	$I_D@T_C=100^{\circ}C$	42	A
Pulsed Drain Current ²	I_{DM}	240	A
Single Pulse Avalanche Energy ³	EAS	80	mJ
Avalanche Current	I_{AS}	40	A
Total Power Dissipation ⁴	$P_D@T_C=25^{\circ}C$	65	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	$R_{\theta JC}$	---	1.4	$^{\circ}C/W$

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$, $I_D=250\mu A$	60	---	---	V
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	$V_{GS}=10V$, $I_D=20A$	---	7.0	8.5	$m\Omega$
		$V_{GS}=4.5V$, $I_D=15A$	---	9.5	12	$m\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1.2	---	2.5	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=48V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	1	μA
		$V_{DS}=48V$, $V_{GS}=0V$, $T_J=55^{\circ}\text{C}$	---	---	5	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
Gate Resistance	R_g	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	1.2	---	Ω
Total Gate Charge	Q_g	$V_{DS}=30V$, $V_{GS}=10V$, $I_D=18A$	---	57	---	nC
Gate-Source Charge	Q_{gs}		---	8.7	---	
Gate-Drain Charge	Q_{gd}		---	14	---	
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=30V$, $V_{GS}=10V$, $R_G=3.3\Omega$, $I_D=20A$	---	16.2	---	ns
Rise Time	T_r		---	41.2	---	
Turn-Off Delay Time	$T_{d(off)}$		---	56.4	---	
Fall Time	T_f		---	16.2	---	
Input Capacitance	C_{iss}	$V_{DS}=30V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	3307	---	pF
Output Capacitance	C_{oss}		---	201	---	
Reverse Transfer Capacitance	C_{rss}		---	151	---	

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	---	---	70	A
Diode Forward Voltage ²	V_{SD}	$V_{GS}=0V$, $I_S=1A$, $T_J=25^{\circ}\text{C}$	---	---	1.2	V
Reverse Recovery Time	t_{rr}	$I_F=20A$, $di/dt=100A/\mu s$, $T_J=25^{\circ}\text{C}$	---	22	---	nS
Reverse Recovery Charge	Q_{rr}		---	72	---	nC

Note:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating. The test condition is $V_{DD}=50V$, $V_{GS}=10V$, $L=0.1mH$
4. The power dissipation is limited by 150°C junction temperature
5. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

Typical Characteristics

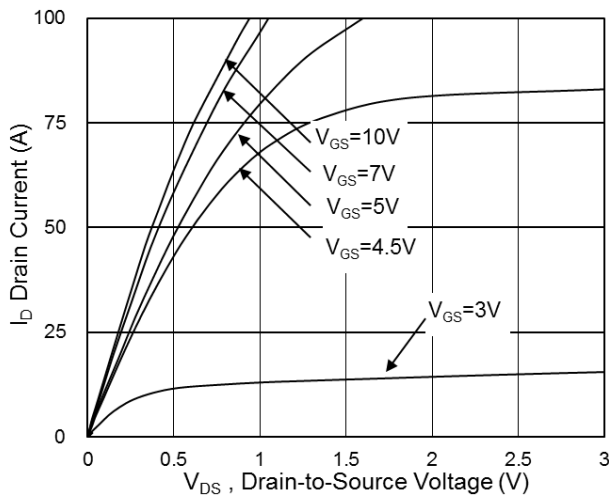


Fig.1 Typical Output Characteristics

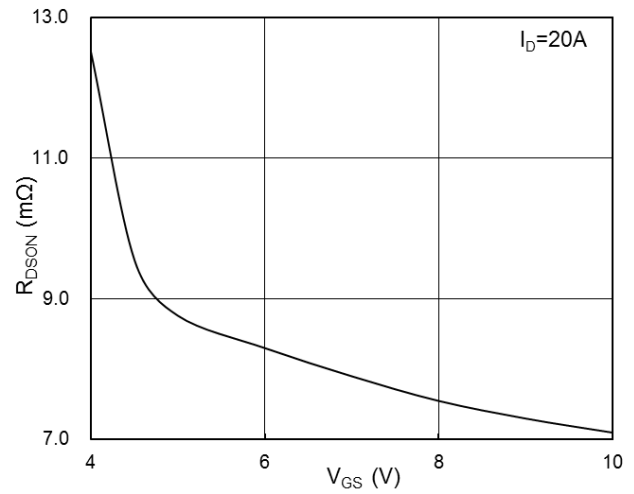


Fig.2 On-Resistance vs Gate-Source Voltage

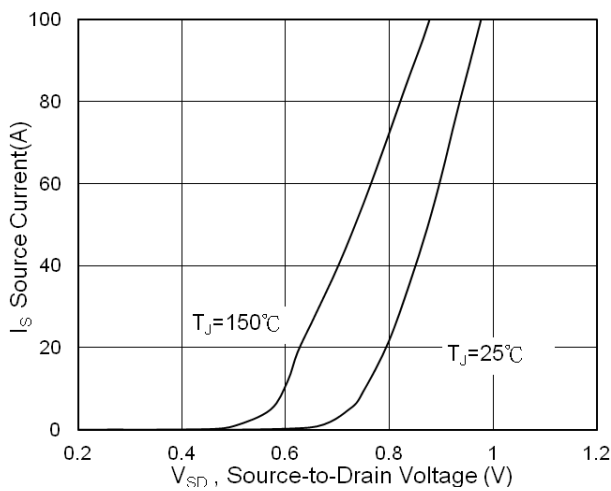


Fig.3 Forward Characteristics of Reverse

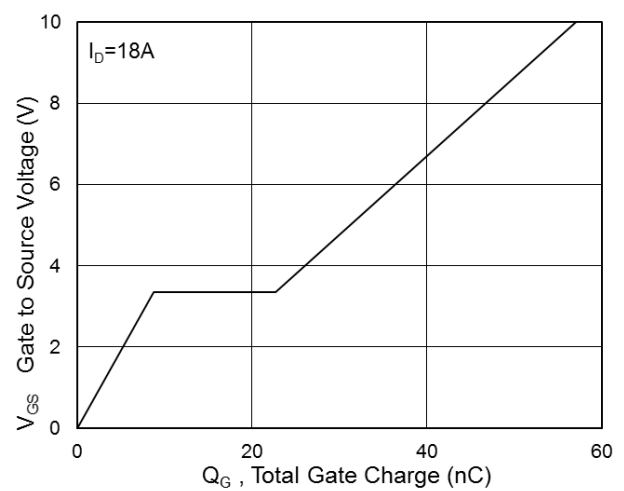


Fig.4 Gate-Charge Characteristics

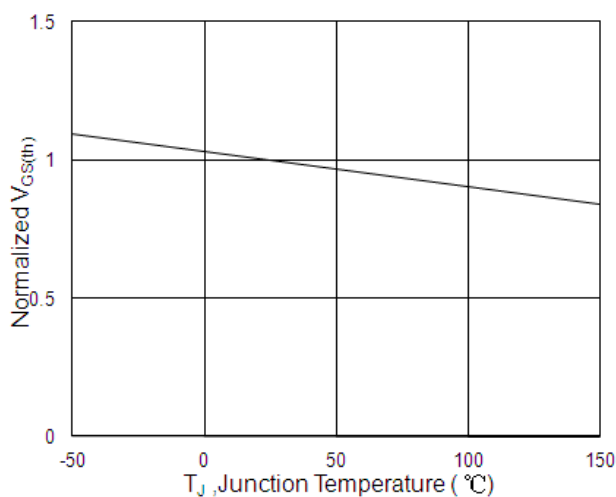


Fig.5 Normalized $V_{GS(th)}$ vs T_J

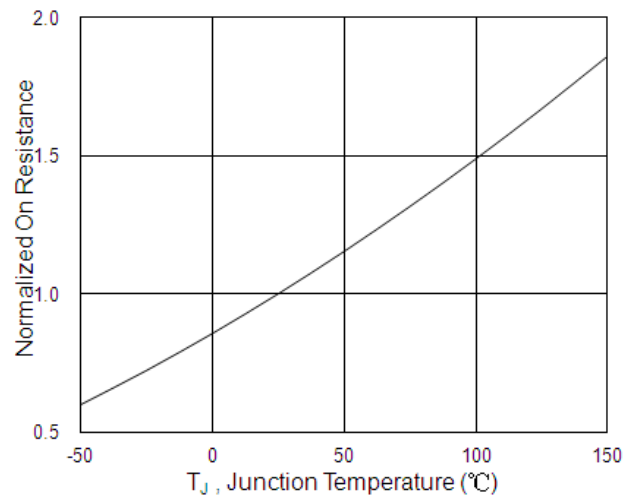


Fig.6 Normalized $R_{DS(on)}$ vs T_J

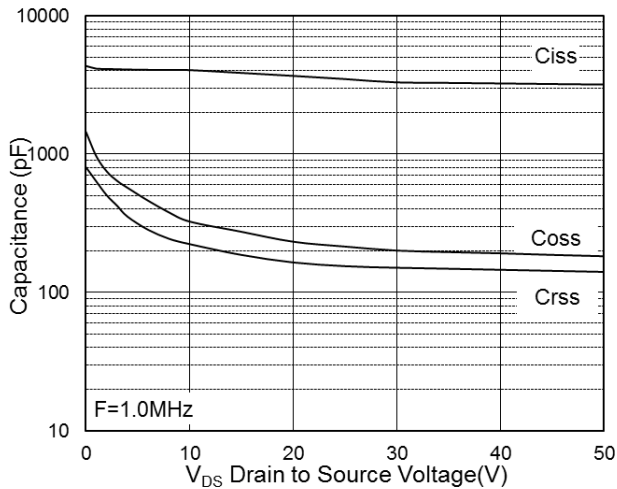


Fig.7 Capacitance

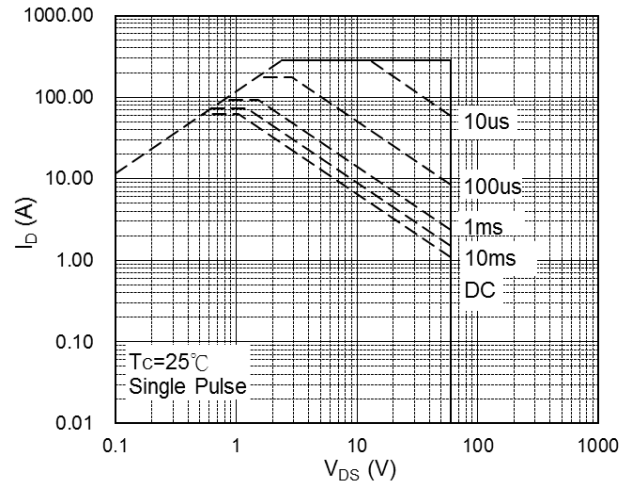


Fig.8 Safe Operating Area

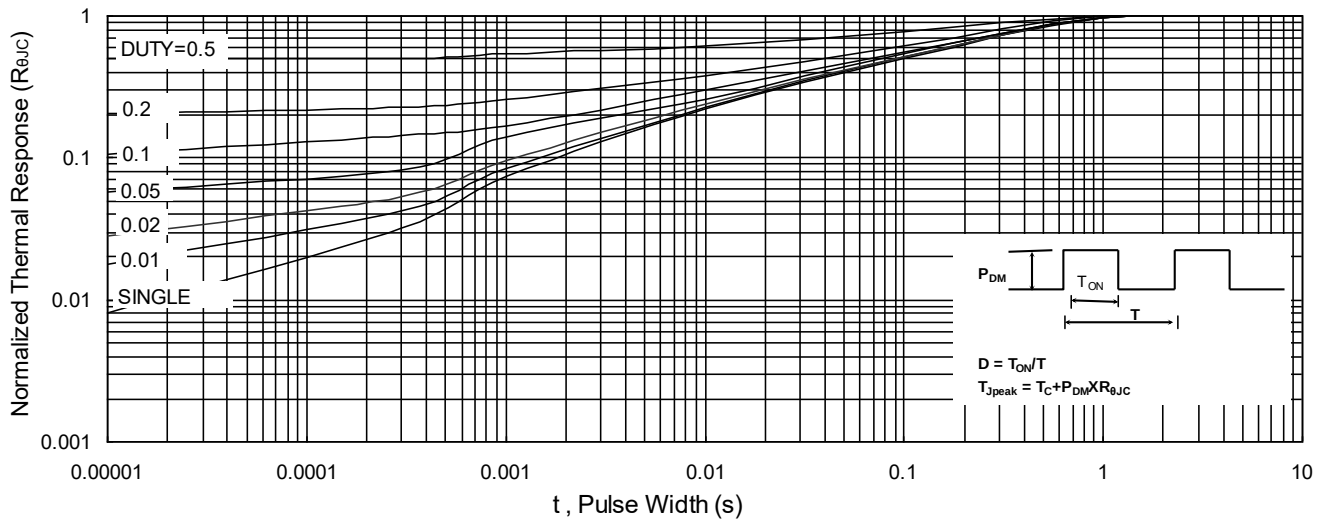


Fig.9 Normalized Maximum Transient Thermal Impedance

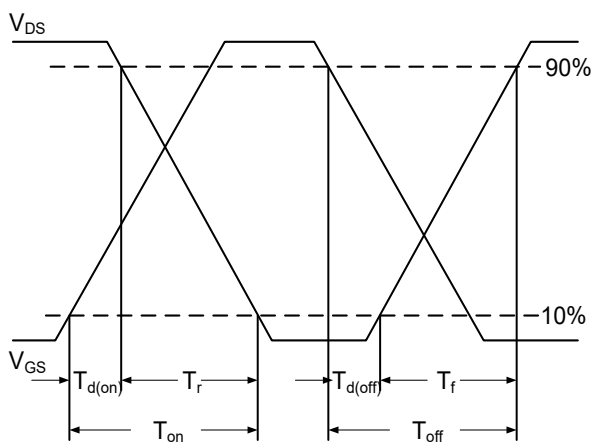


Fig.10 Switching Time Waveform

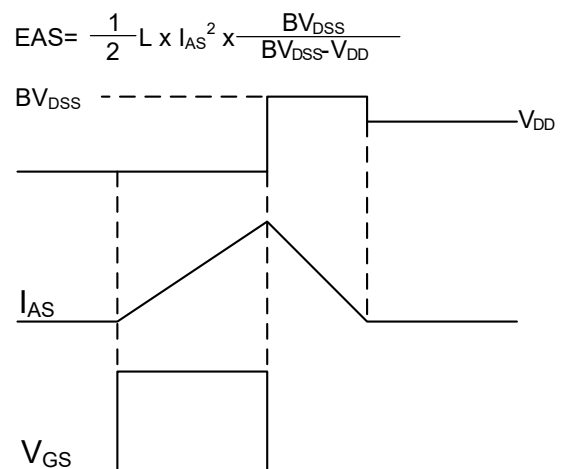
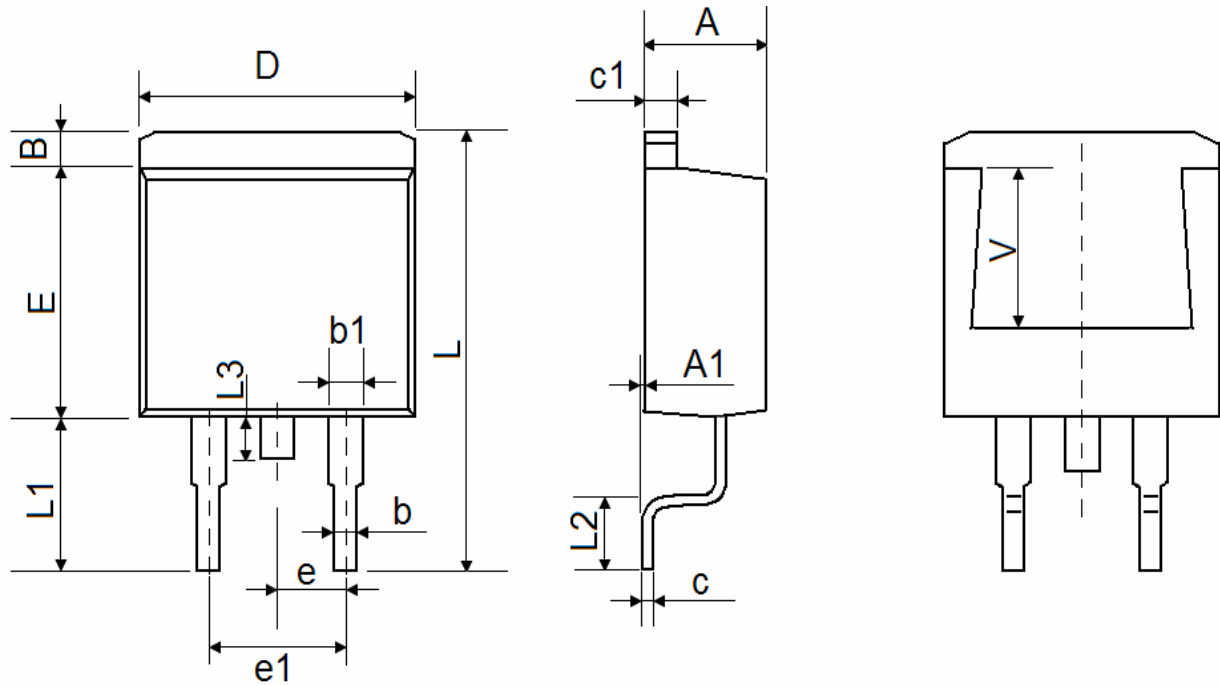


Fig.11 Unclamped Inductive Switching Waveform

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		