


**Features**

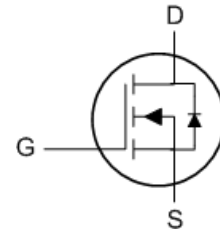
- ★ Advanced Trench MOS Technology
- ★ 100% EAS Guaranteed
- ★ Fast Switching Speed
- ★ Green Device Available

**Applications**

- ★ High Frequency Switching and Synchronous Rectification.
- ★ DC/DC Converter.

**Product Summary**

BVDSS	RDSON	ID
100V	11.5mΩ	60A

**TO220 Pin Configuration**

**Absolute Maximum Ratings**

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	100	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current <sup>1</sup>	60	A
$I_D@T_C=100^\circ C$	Continuous Drain Current <sup>1</sup>	39	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	160	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	33	mJ
$I_{AS}$	Avalanche Current	15	A
$P_D@T_C=25^\circ C$	Total Power Dissipation <sup>4</sup>	62.5	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

**Thermal Data**

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>1</sup>	---	55	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	---	2	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=10V, I_D=20A$	---	8	11.5	m $\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	2	---	4	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	$\mu A$
		$V_{DS}=80V, V_{GS}=0V, T_J=55^\circ\text{C}$	---	---	5	
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
$Q_g$	Total Gate Charge	$V_{DS}=50V, V_{GS}=10V, I_D=20A$	---	38	---	nC
$Q_{gs}$	Gate-Source Charge		---	9	---	
$Q_{gd}$	Gate-Drain Charge		---	10.6	---	
$T_d(on)$	Turn-On Delay Time	$V_{DD}=50V, V_{GS}=10V, R_G=3.3\Omega, I_D=20A$	---	8.5	---	ns
$T_r$	Rise Time		---	4.2	---	
$T_d(off)$	Turn-Off Delay Time		---	32	---	
$T_f$	Fall Time		---	7	---	
$C_{iss}$	Input Capacitance	$V_{DS}=50V, V_{GS}=0V, f=1\text{MHz}$	---	2206	---	pF
$C_{oss}$	Output Capacitance		---	377	---	
$C_{rss}$	Reverse Transfer Capacitance		---	4	---	

**Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current <sup>1,5</sup>	$V_G=V_D=0V$ , Force Current	---	---	35	A
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_F=20A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$	---	40	---	nS
$Q_{rr}$	Reverse Recovery Charge	$T_J=25^\circ\text{C}$	---	162	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ 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  $V_{DD}=25V, V_{GS}=10V, L=0.3mH, I_{AS}=15A$
- 4.The power dissipation is limited by  $150^\circ\text{C}$  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

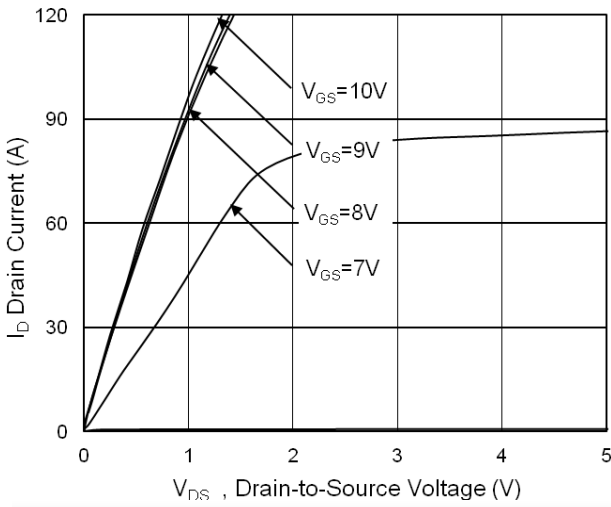


Fig.1 Typical Output Characteristics

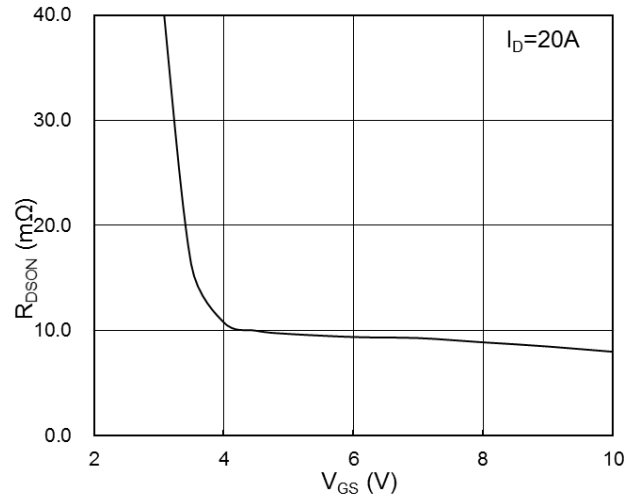


Fig.2 On-Resistance vs G-S Voltage

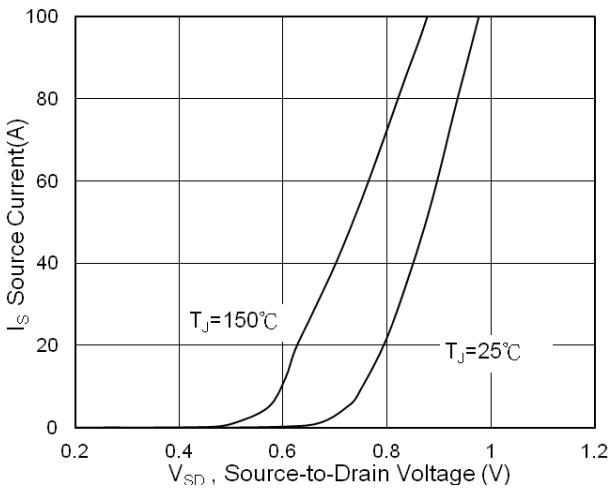


Fig.3 Source Drain Forward Characteristics

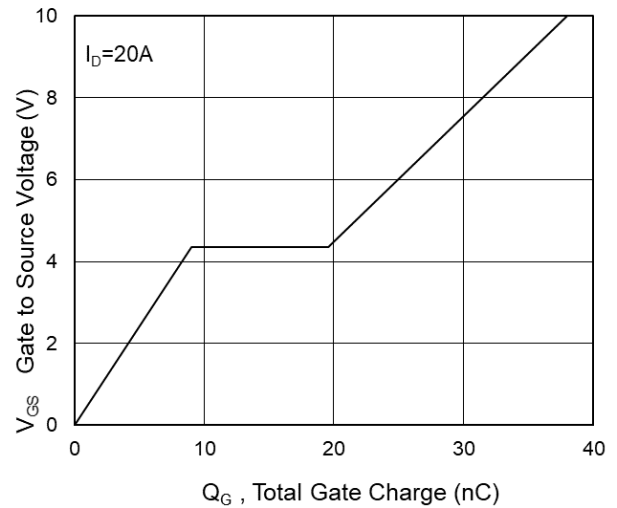


Fig.4 Gate-Charge Characteristics

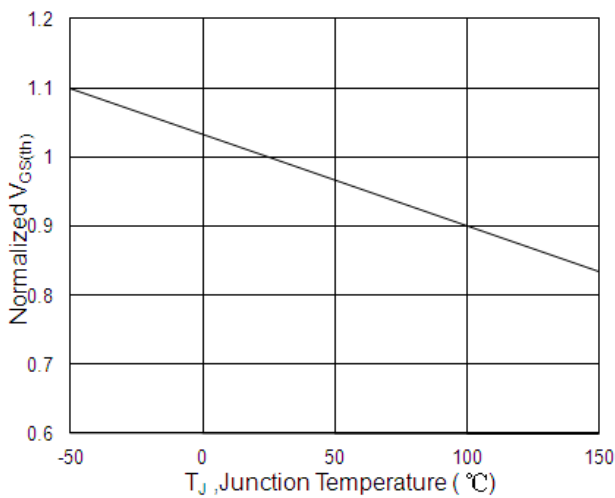


Fig.5 Normalized  $V_{GS(th)}$  vs  $T_J$

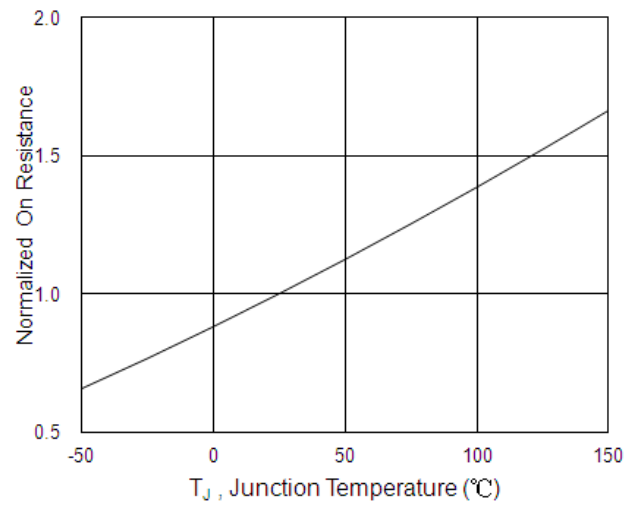


Fig.6 Normalized  $R_{DS(on)}$  vs  $T_J$

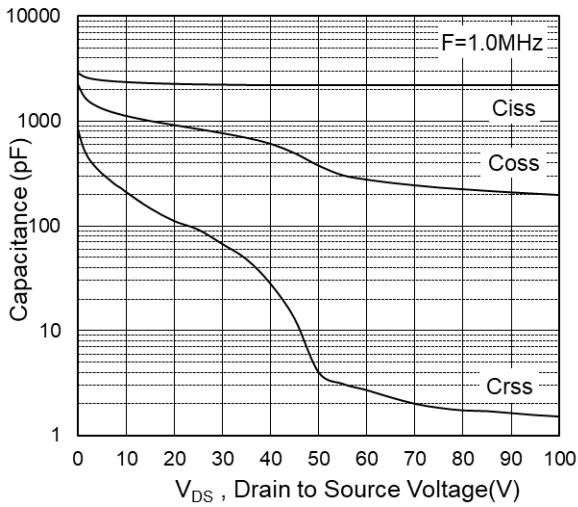


Fig.7 Capacitance

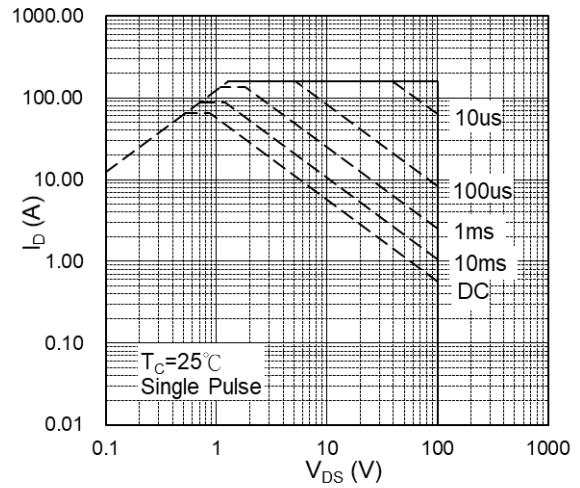


Fig.8 Safe Operating Area

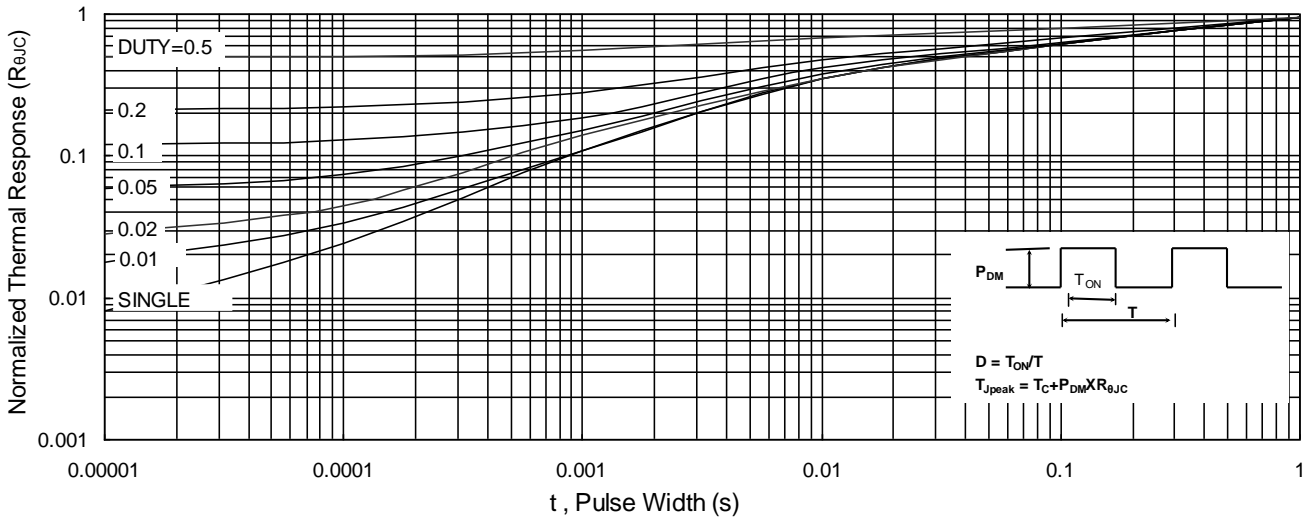


Fig.9 Normalized Maximum Transient Thermal Impedance



Fig.10 Switching Time Waveform

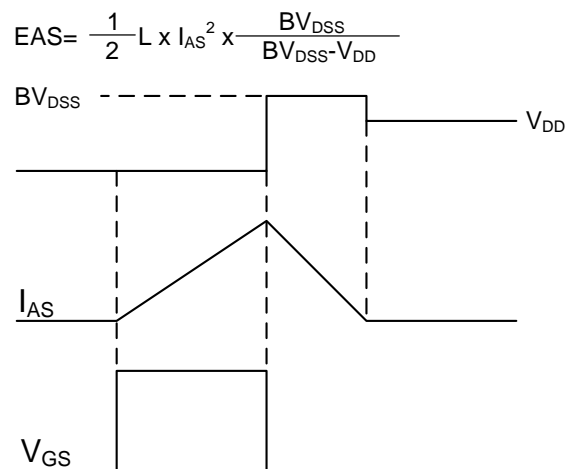


Fig.11 Unclamped Inductive Switching Waveform