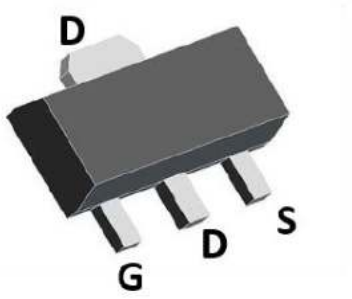
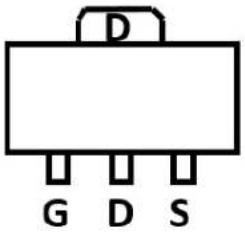
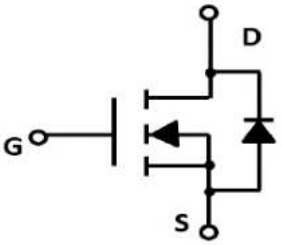
N-Channel Enhancement Mode Field Effect Transistor





SOT-89



Product Summary

- V_{DS} 40V
- I_D 7A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜85 mohm
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜110 mohm

General Description

- Trench Power MV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Applications

- DC-DC Converters
- Power management functions

■ **Absolute Maximum Ratings** (T_A=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	40	V
Gate-source Voltage	V_{GS}	±20	V
Drain Current	I_D	7	A
Pulsed Drain Current [A]	I_{DM}	20	A
Total Power Dissipation @ T_C=25℃	P_D	1.2	W
Thermal Resistance Junction-to-Ambient [B]	$R_{\theta JA}$	105	℃/ W
Junction and Storage Temperature Range	T_J ,T_{STG}	-55～+150	℃

■ Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS1}	V_{GS}= ±20V, V_{DS}=0V			±100	nA
	I_{GSS2}	V_{GS}= ±10V, V_{DS}=0V			±50	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	0.8	1.2	2.2	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=5A		32	45	mΩ
		V_{GS}= 4.5V, I_D=4A		40	58	
Diode Forward Voltage	V_{SD}	I_S=3.6A,V_{GS}=0V		0.8	1.2	V
Maximum Body-Diode Continuous Current	I_S				10	A
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=20V,V_{GS}=0V,f=1MHZ		900		pF
Output Capacitance	C_{oss}			125		
Reverse Transfer Capacitance	C_{rss}			108		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=20V,I_D=10A		23.3		nC
Gate-Source Charge	Q_{gs}			4.5		
Gate-Drain Charge	Q_{gd}			6.5		
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DD}=20V, I_D=2A,R_L=1Ω R_{GEN}=3Ω		10		ns
Turn-on Rise Time	t_r			55		
Turn-off Delay Time	$t_{D(off)}$			28		
Turn-off fall Time	t_f			72		

A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.
B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

■ Typical Performance Characteristics

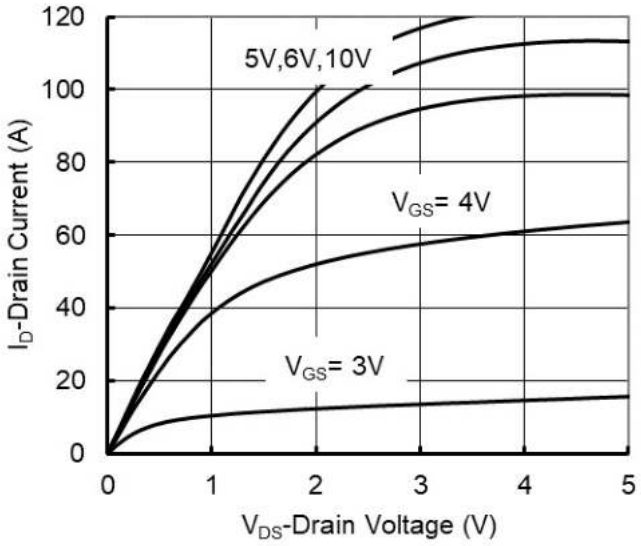


Figure 1. Output Characteristics

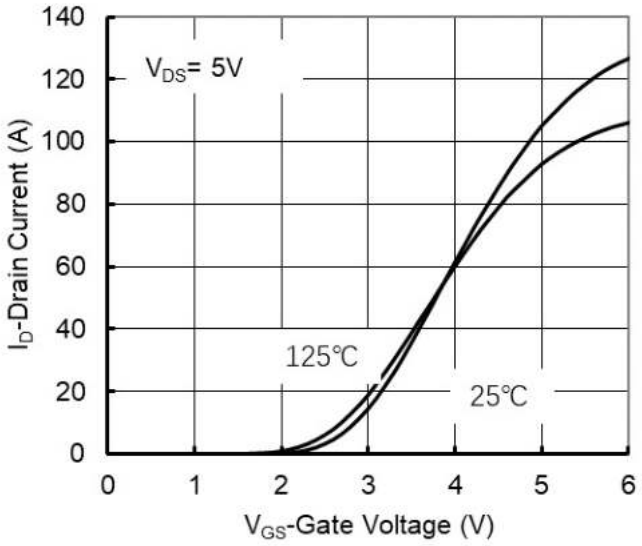


Figure 2. Transfer Characteristics

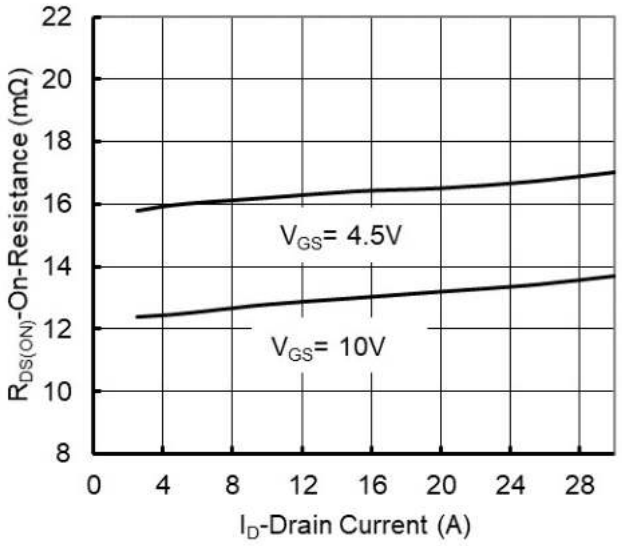


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

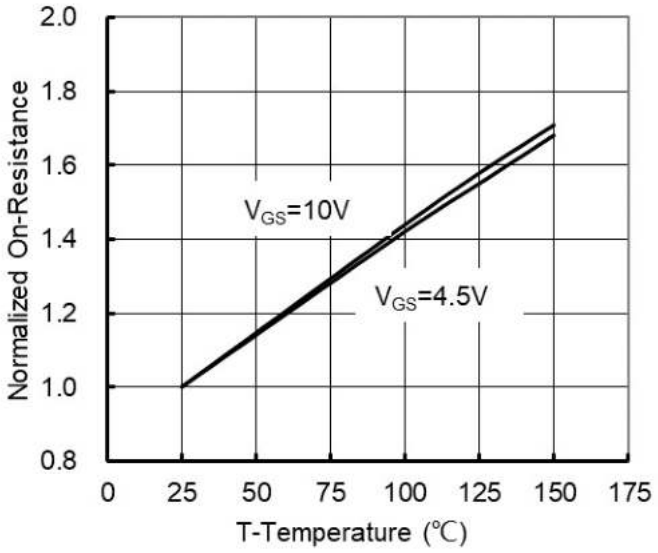


Figure 4. On-Resistance vs. Junction Temperature

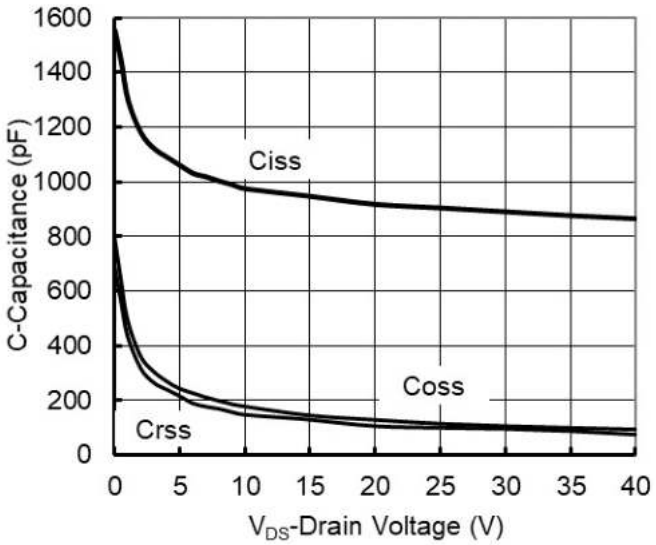


Figure 5. Capacitance Characteristics

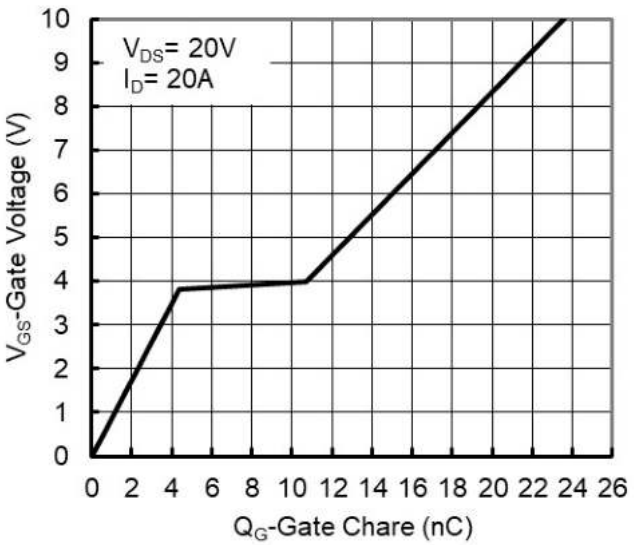


Figure 6. Gate Charge

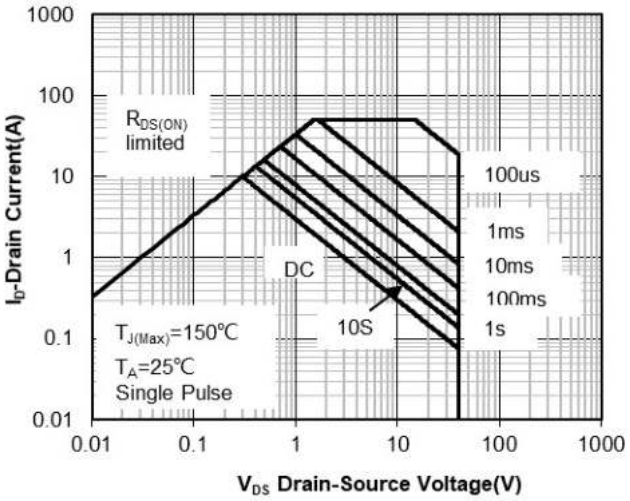


Figure 7. Safe Operation Area

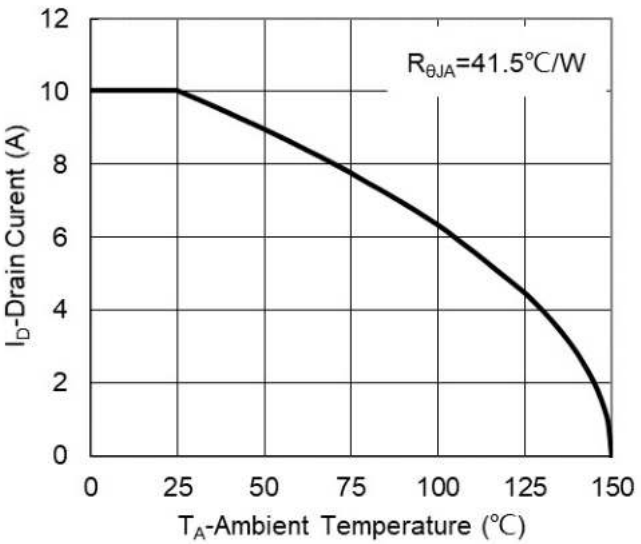
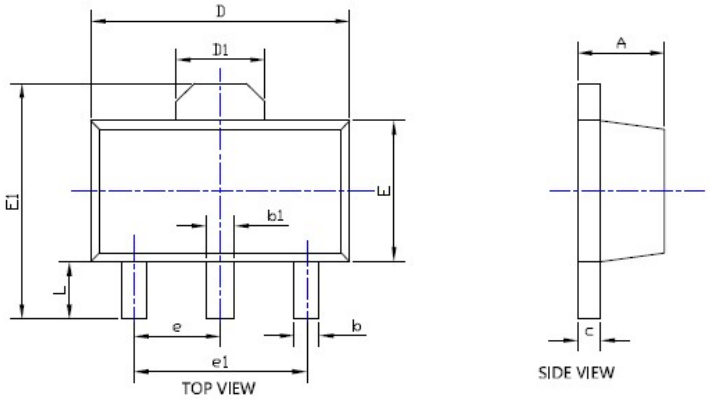


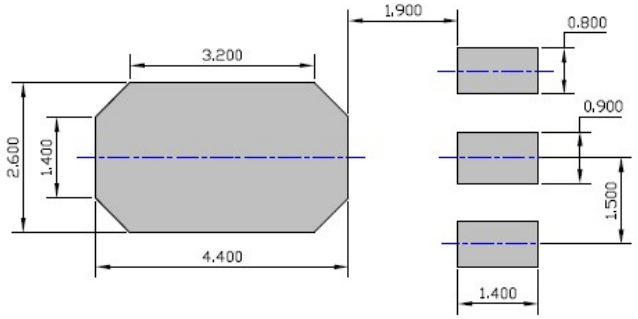
Figure 8. Maximum Continuous Drain Current vs Ambient Temperature

■ SOT-89 Package Information



DIMENSIONS						
SYMBOL	INCHES			Millmeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.055	0.059	0.063	1.400	1.500	1.600
b	0.014	---	0.020	0.350	---	0.520
b1	0.016	---	0.023	0.400	---	0.580
c	0.014	---	0.017	0.350	---	0.440
D	0.173	0.177	0.181	4.400	4.500	4.600
D1	0.061REF			1.550REF		
E	0.093	0.096	0.100	2.350	2.450	2.550
E1	0.155	---	0.167	3.940	---	4.250
e	0.059TYP			1.500TYP		
e1	0.118TYP			3.000TYP		
L	0.035	0.039	0.043	0.900	1.000	1.100

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.



UNIT：mm

SUGGESTED SOLDER PAD LAYOUT