TF6968E

Dual N-Channel MOSFET – ESD Protected

V_{DS}=20V

$R_{DS(ON)}$, V_{GS} @ 4.5V = 22mΩ

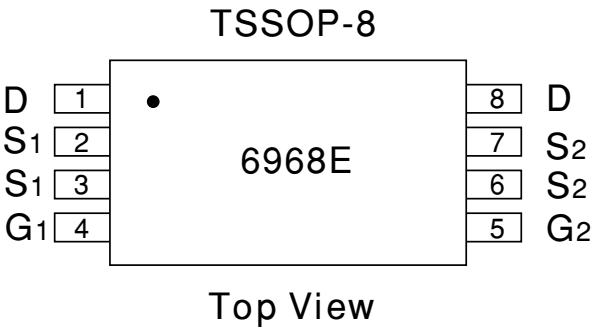
$R_{DS(ON)}$, V_{GS} @ 3.5V = 23 mΩ

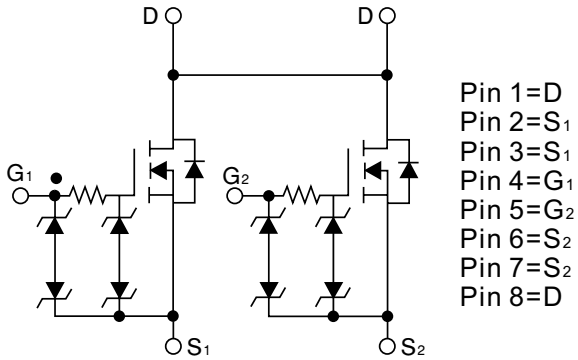
$R_{DS(ON)}$, V_{GS} @ 2.5V = 29 mΩ

I_D = 6.5A

Features

- Advanced trench process technology
- Specially designed for Li-Ion battery packs
- Designed for battery switch applications
- ESD Protected :3000V
- TSSOP-8 package





Maximum ratings and thermal Characteristics (T_A=25℃ unless otherwise noted)

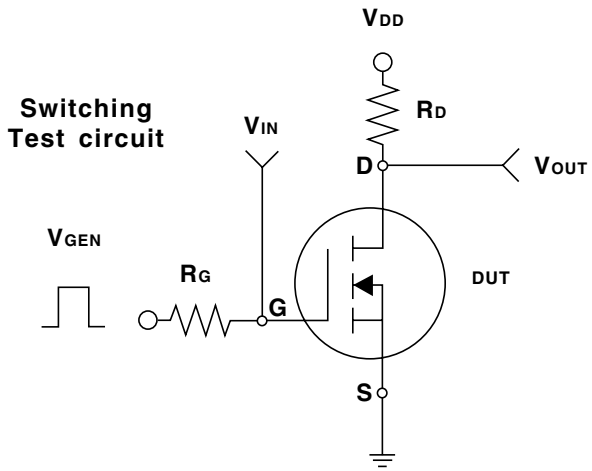
Type Number	**Symbol**	**Limit**	Units
Drain-Source Voltage	V_{DS}	20	V
Gate-Source-Voltage	V_{GS}	±12	V
Continuous Drain Current TA = 25 ℃	I_D	6.5	A
Pulsed Drain Current (Note)	I_{DM}	30	A
Maximum Power Dissipation TA = 25℃ TA = 70℃	P_D	1.5 0.96	W
Operating Junction and Storage Temperature Range (Note)	T_J, Tstg	-55 to+ 150	℃
Lead Temperature (1/8: from case for 5 sec.)	T_L		
Junction-to=Foot (drain) Thermal resistance	$R_{\theta JF}$	35	℃/W
Junction-to-Ambient Thermal Resistance (PCB mounted)	$R_{\theta JA}$	83	

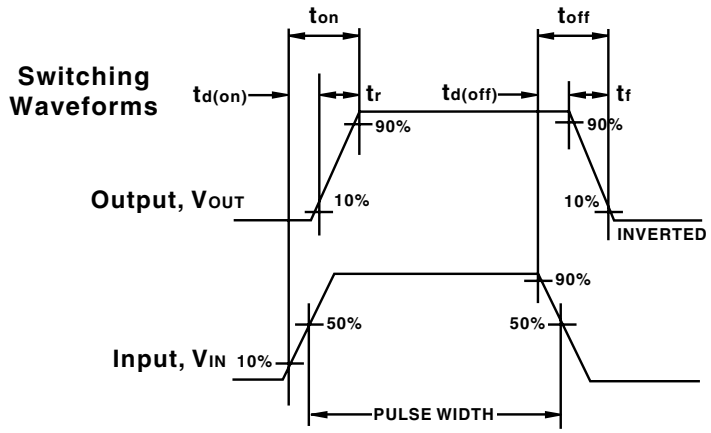
Note: Surface Mounted on FR4 Board t≦10 sec.

Electrical Characteristics

Type Number	Symbol	Test Condition	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	20	-	-	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=4.5V, I_D=6.5A		15	22	mΩ
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=3.5V, I_D=6A		17	23	
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=2.5V, I_D=5.5A		20	29	
Gate Threshold Voltage	$R_{GS(th)}$	V_{DS}= V_{GS}, I_D=250uA	0.5	0.85		V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			10	uA
Gate Body Leakage	I_{GSS}	V_{GS}=±12V, V_{DS}=0V			±10	uA
On-State Drain Current	$I_{D(on)}$	V_{DS}≧5V, V_{GS}=4.5V	30			A
Forward Transconductance	gfs	V_{DS}= 10V, I_D=6.5A		30		S
Dynamic						
Total Gate Charge	Qg	V_{DS}= 10V, I_D=6.5A V_{GS}=4.5V		15.5	30	nC
Gate-Source Charge	Qgs			2		
Gate-Drain Charge	Qgd			3.5		
Turn-On Delay Time	td(on)	V_{DD}= 10V,R_L=10Ω, I_D=1A V_{GEN}=4.5V R_G=6Ω		75	100	nS
Turn-On Rise Time	tr			125	150	
Turn-Off Delay Time	td(off)			600	720	
Turn-Off Fall time	tf			300	360	
Input Capacitance	Ciss	V_{DS}=10V, V_{GS}=0V f=1.0 MHz		1360		pF
Output Capacitance	Coss			220		
Reverse Transfer Capacitance	Crss			130		
Source-Drain Diode						
Max. Diode Forward Current	I_S				1.5	A
Diode Forward Voltage	V_{SD}	I_S=1.5A, V_{GS}=0V		0.61	1.2	V

Note: Pulse Test: Pulse Width ≦300uS, Duty Cycle≦2%.





RATINGS AND CHARACTERISTIC CURVES (TF6968E)

FIG1-Output Characterisric

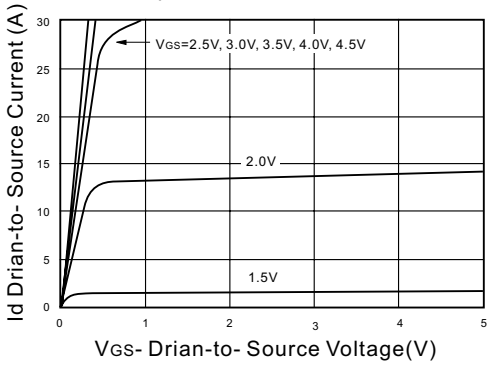


FIG2-Transfer Characterisric

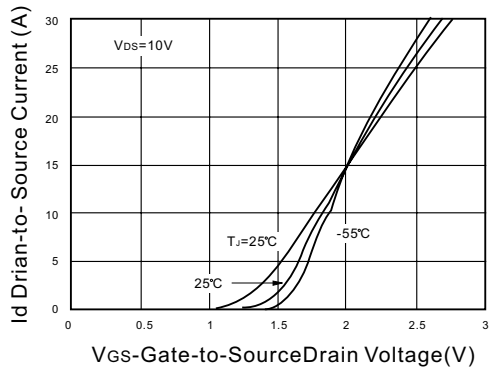


FIG3-On Resistance vs Drian Current

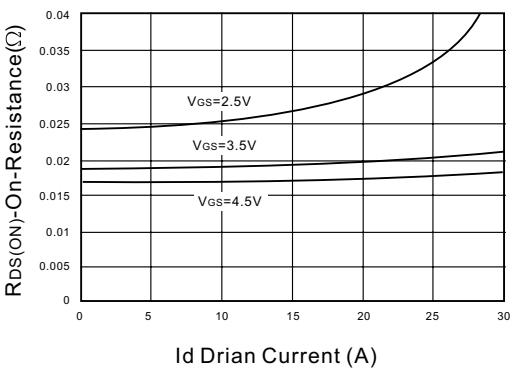


FIG4-On Resistance vs Gate-to Source Current

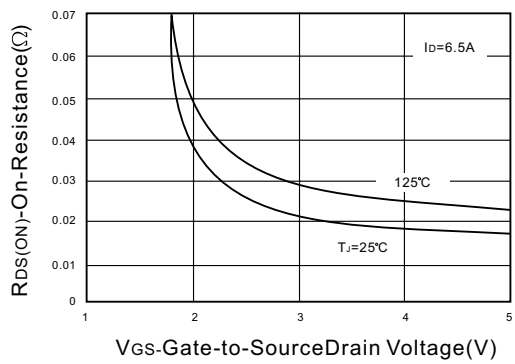
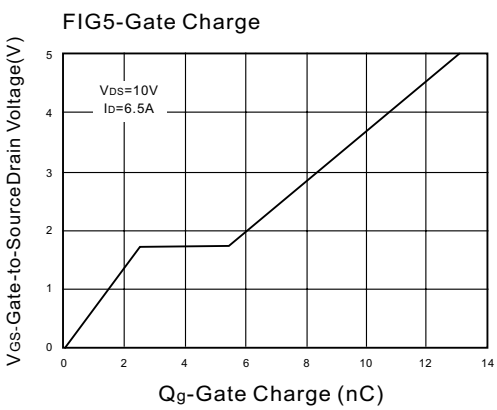


FIG5-Gate Charge



RATINGS AND CHARACTERISTIC CURVES (TF6968E)

FIG6-On Resistance vs Junction Temperature

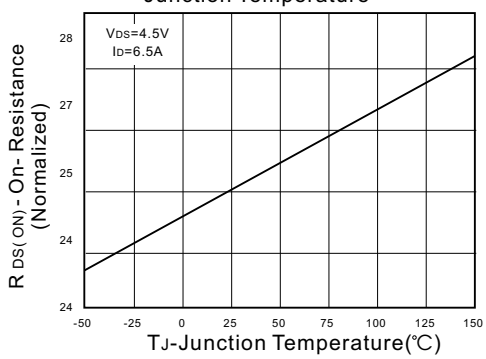


FIG7-Threshold Voltage vs Temperature

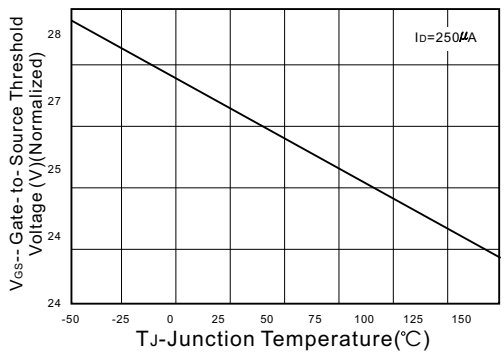


FIG8-Breakdown Voltage vs Junction Temperature

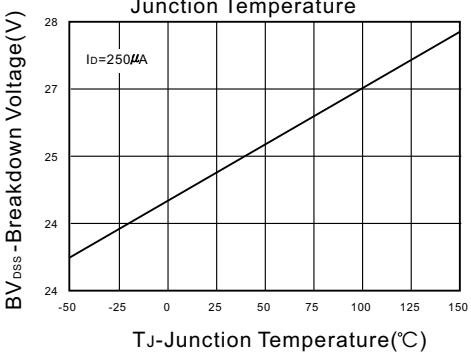


FIG9-Source-Drain Dlode Forward Voltage

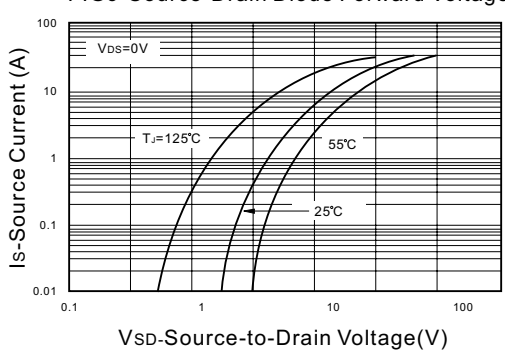


FIG10-Maximum Safe Operating Area

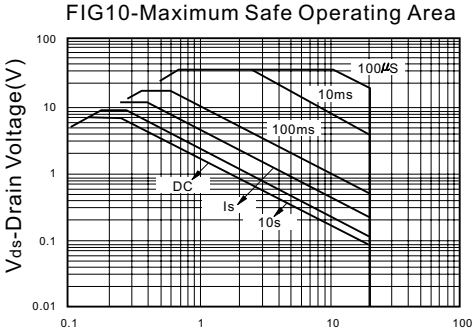


FIG11-Transient Thermal Impedance