

این دیتاشیت توسط توکل الکترونیک تهیه و ارائه شده است.

جهت مشاهده قیمت، موجودی و ثبت سفارش این قطعه به وبسایت توکل الکترونیک مراجعه فرمایید.

مشاهده قیمت و خرید
برای خرید و مشاهده سایر محصولات کلیک کنید

F e-Front runners

FMH23N50E

FUJI POWER MOSFET

Super FAP-E³ series

N-CHANNEL SILICON POWER MOSFET

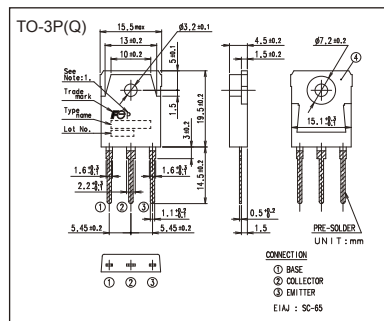
Features

- Maintains both low power loss and low noise
- Lower $R_{DS(on)}$ characteristic
- More controllable switching dv/dt by gate resistance
- Smaller V_{GS} ringing waveform during switching
- Narrow band of the gate threshold voltage ($3.0 \pm 0.5V$)
- High avalanche durability

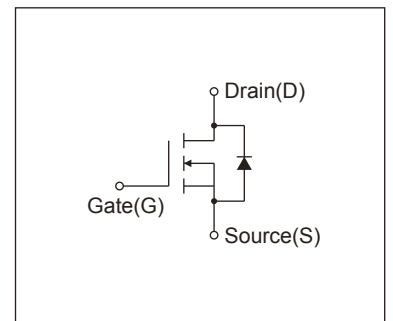
Applications

- Switching regulators
- UPS (Uninterruptible Power Supply)
- DC-DC converters

Outline Drawings [mm]



Equivalent circuit schematic



Maximum Ratings and Characteristics

Absolute Maximum Ratings at $T_c=25^\circ C$ (unless otherwise specified)

Description	Symbol	Characteristics	Unit	Remarks
Drain-Source Voltage	V_{DS}	500	V	
	V_{DSX}	500	V	$V_{GS} = -30V$
Continuous Drain Current	I_D	± 23	A	
Pulsed Drain Current	I_{DP}	± 92	A	
Gate-Source Voltage	V_{GS}	± 30	V	
Repetitive and Non-Repetitive Maximum Avalanche Current	I_{AR}	23	A	Note*1
Non-Repetitive Maximum Avalanche Energy	E_{AS}	767.3	mJ	Note*2
Repetitive Maximum Avalanche Energy	E_{AR}	31.5	mJ	Note*3
Peak Diode Recovery dV/dt	dV/dt	9.3	kV/ μs	Note*4
Peak Diode Recovery $-di/dt$	$-di/dt$	100	A/ μs	Note*5
Maximum Power Dissipation	P_D	2.50 315	W	$T_a=25^\circ C$ $T_c=25^\circ C$
Operating and Storage Temperature range	T_{ch} T_{stg}	150 -55 to + 150	$^\circ C$ $^\circ C$	

Electrical Characteristics at $T_c=25^\circ C$ (unless otherwise specified)

Description	Symbol	Conditions	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu A$, $V_{GS}=0V$	500	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$I_D=250\mu A$, $V_{DS}=V_{GS}$	2.5	3.0	3.5	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=500V$, $V_{GS}=0V$ $V_{DS}=400V$, $V_{GS}=0V$	-	-	25 250	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V$, $V_{DS}=0V$	-	10	100	nA
Drain-Source On-State Resistance	$R_{DS(on)}$	$I_D=11.5A$, $V_{GS}=10V$	-	0.21	0.245	Ω
Forward Transconductance	g_{fs}	$I_D=11.5A$, $V_{DS}=25V$	14	28	-	S
Input Capacitance	C_{iss}	$V_{DS}=25V$	-	3500	5250	pF
Output Capacitance	C_{oss}	$V_{GS}=0V$	-	330	495	
Reverse Transfer Capacitance	C_{rss}	$f=1MHz$	-	24	36	
Turn-On Time	$t_{d(on)}$ t_r	$V_{cc}=300V$ $V_{GS}=10V$	-	24 13	36 19.5	ns
Turn-Off Time	$t_{d(off)}$ t_f	$I_D=11.5A$ $R_{GS}=5.6\Omega$	-	150 20	225 30	
Total Gate Charge	Q_{th}	$V_{cc}=250V$	-	11	16.5	nC
Gate-Source Charge	Q_{GS}	$I_D=23A$	-	93	139.5	
Gate-Drain Charge	Q_{GD}	$V_{GS}=10V$	-	24	36	
Avalanche Capability	I_{AV}	$L=1.16mH$, $T_{ch}=25^\circ C$	23	-	-	
Diode Forward On-Voltage	V_{SD}	$I_F=23A$, $V_{GS}=0V$, $T_{ch}=25^\circ C$	-	0.90	1.35	V
Reverse Recovery Time	t_{rr}	$I_F=23A$, $V_{GS}=0V$	-	0.5	-	μs
Reverse Recovery Charge	Q_{rr}	$-di/dt=100A/\mu s$, $T_{ch}=25^\circ C$	-	8	-	μC

Thermal Characteristics

Description	Symbol	Test Conditions	min.	typ.	max.	Unit
Thermal resistance	$R_{th(ch-c)}$	Channel to case			0.40	$^\circ C/W$
	$R_{th(ch-a)}$	Channel to ambient			50.0	$^\circ C/W$

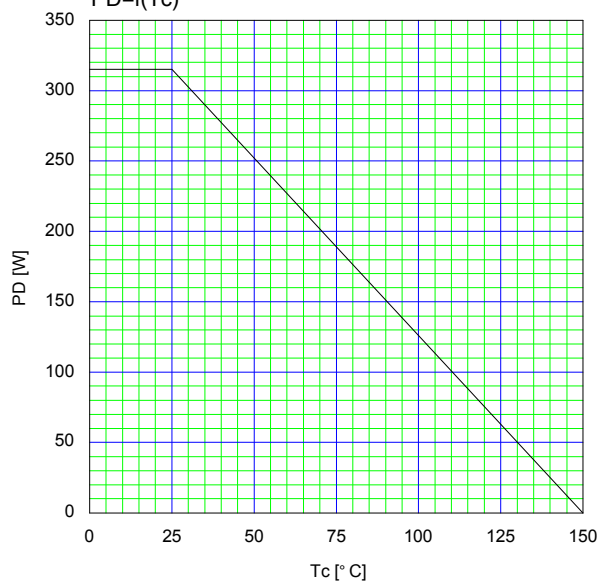
Note *1 : $T_{ch} \leq 150^\circ C$ Note *2 : Stating $T_{ch}=25^\circ C$, $I_{AS}=10A$, $L=14.1mH$, $V_{cc}=50V$, $R_G=50\Omega$ E_{AS} limited by maximum channel temperature and avalanche current.
See to 'Avalanche Energy' graph.

Note *3 : Repetitive rating : Pulse width limited by maximum channel temperature.

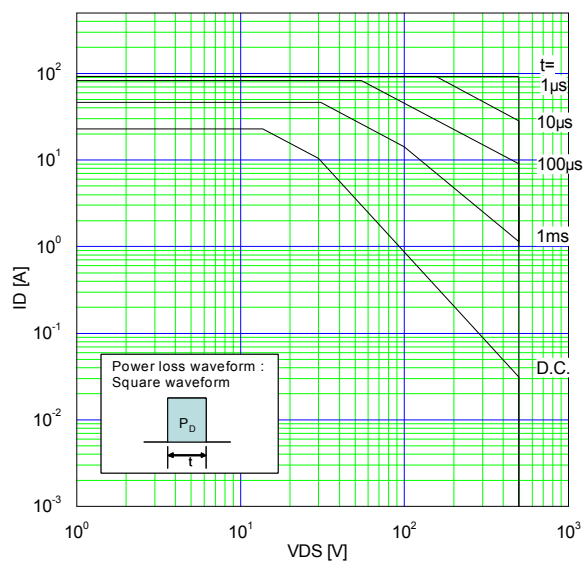
See to the 'Transient Thermal Impedance' graph.

Note *4 : $I_F \leq I_D$, $-di/dt=100A/\mu s$, $V_{cc} \leq BV_{DSS}$, $T_{ch} \leq 150^\circ C$.Note *5 : $I_F \leq I_D$, $dv/dt=5.0kV/\mu s$, $V_{cc} \leq BV_{DSS}$, $T_{ch} \leq 150^\circ C$.

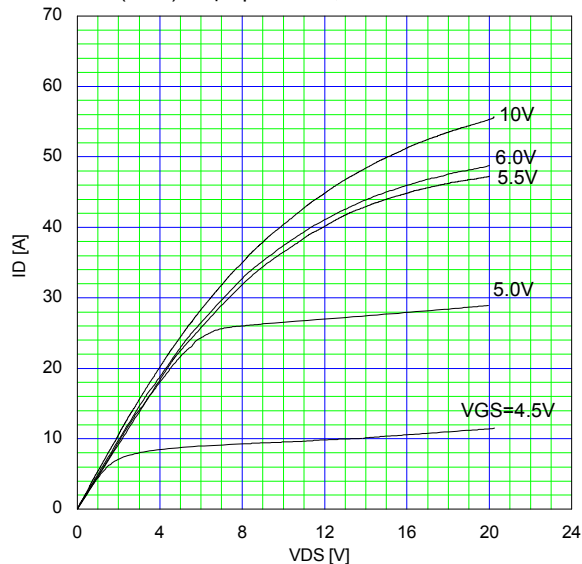
Allowable Power Dissipation
 $P_D = f(T_c)$



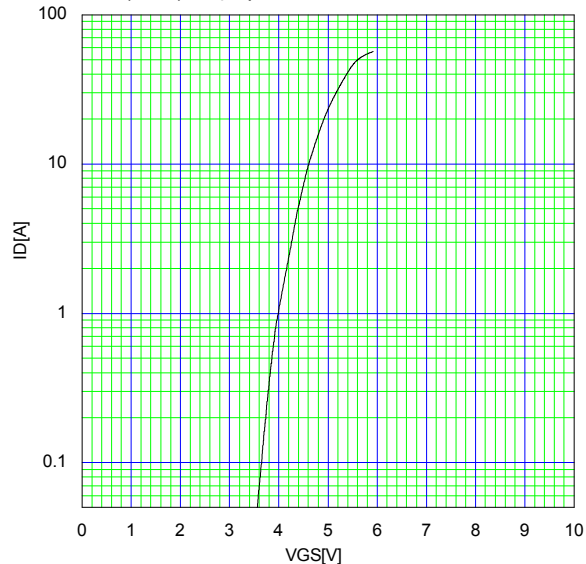
Safe Operating Area
 $I_D = f(V_{DS})$: Duty=0 (Single pulse), $T_c = 25^\circ\text{C}$



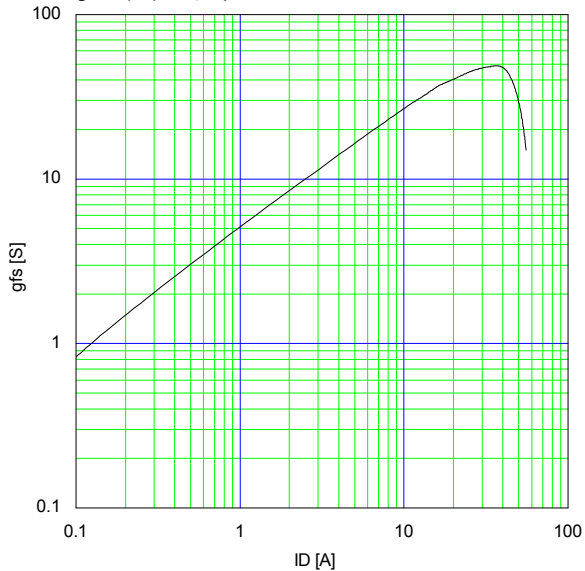
Typical Output Characteristics
 $I_D = f(V_{DS})$: 80 μs pulse test, $T_{ch} = 25^\circ\text{C}$



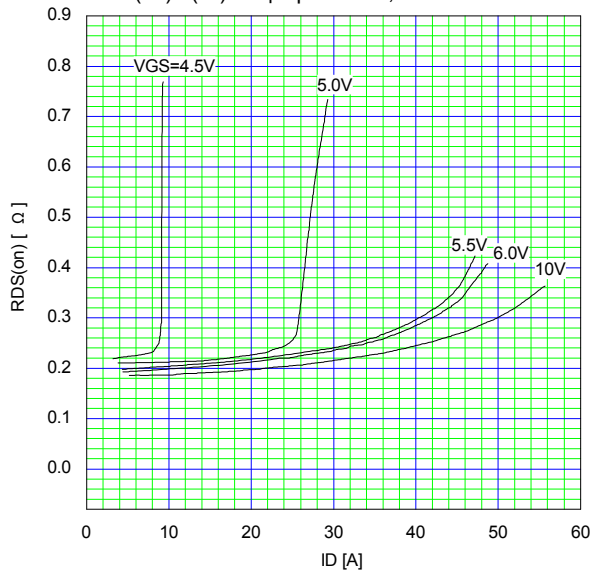
Typical Transfer Characteristic
 $I_D = f(V_{GS})$: 80 μs pulse test, $V_{DS} = 25\text{V}$, $T_{ch} = 25^\circ\text{C}$



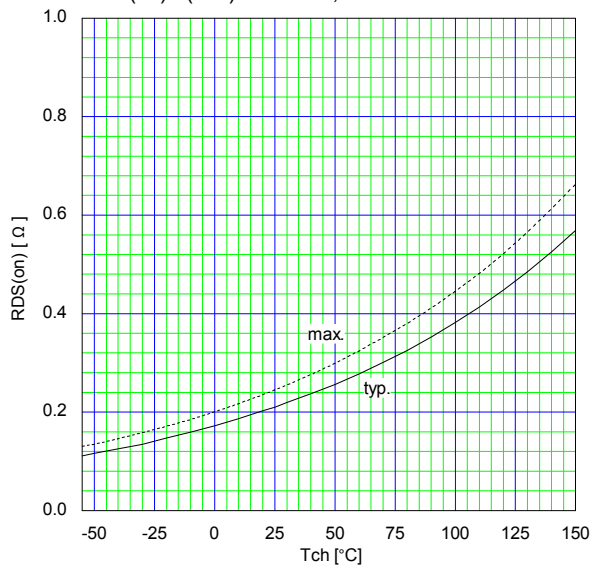
Typical Transconductance
 $g_{fs} = f(I_D)$: 80 μs pulse test, $V_{DS} = 25\text{V}$, $T_{ch} = 25^\circ\text{C}$



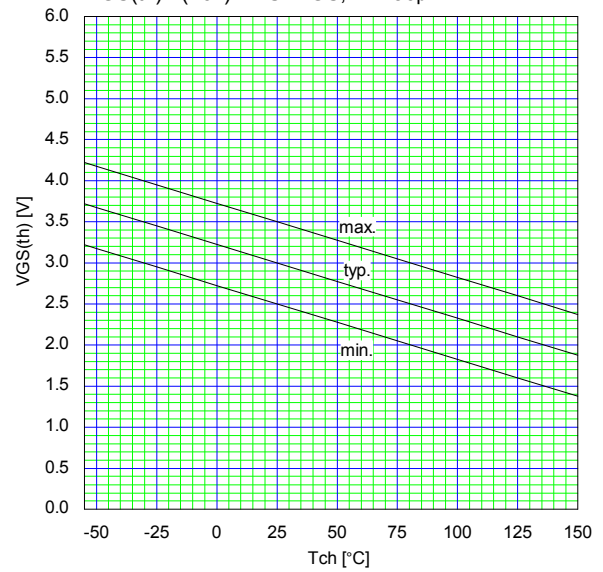
Typical Drain-Source on-state Resistance
 $R_{DS(on)} = f(I_D)$: 80 μs pulse test, $T_{ch} = 25^\circ\text{C}$



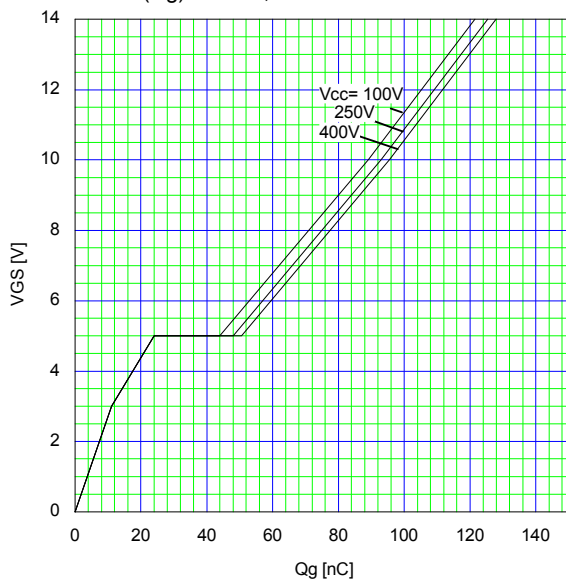
Drain-Source On-state Resistance
 $R_{DS(on)} = f(T_{ch}): I_D = 11.5A, V_{GS} = 10V$



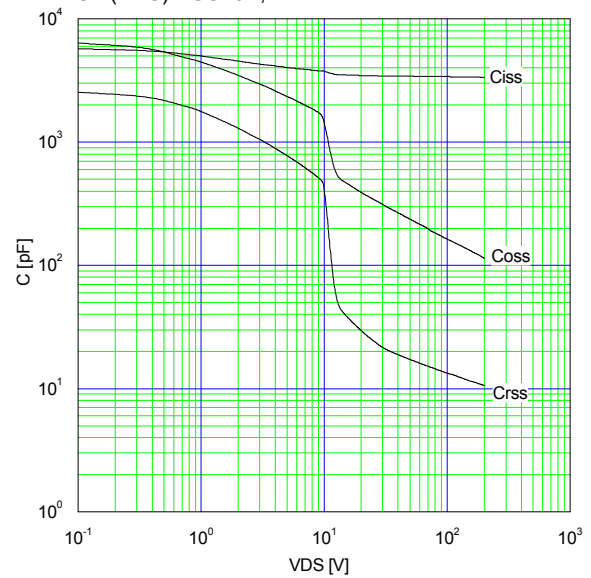
Gate Threshold Voltage vs. T_{ch}
 $V_{GS(th)} = f(T_{ch}): V_{DS} = V_{GS}, I_D = 250\mu A$



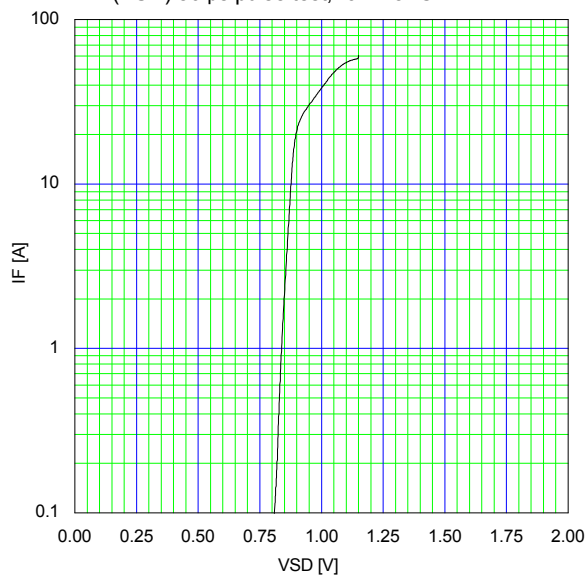
Typical Gate Charge Characteristics
 $V_{GS} = f(Q_g): I_D = 23A, T_{ch} = 25^{\circ}C$



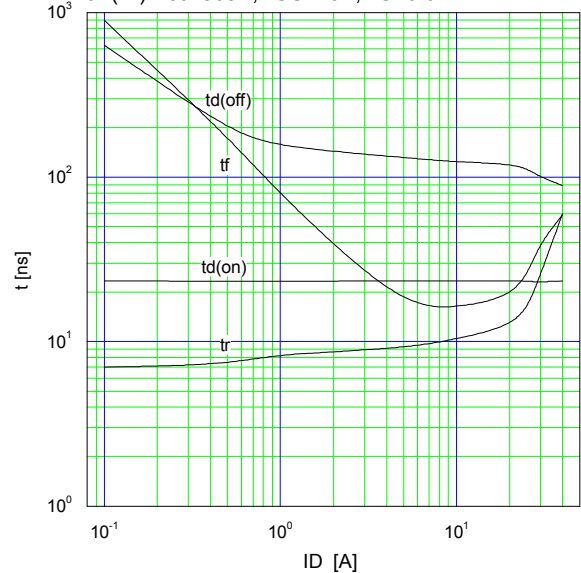
Typical Capacitance
 $C = f(V_{DS}): V_{GS} = 0V, f = 1MHz$



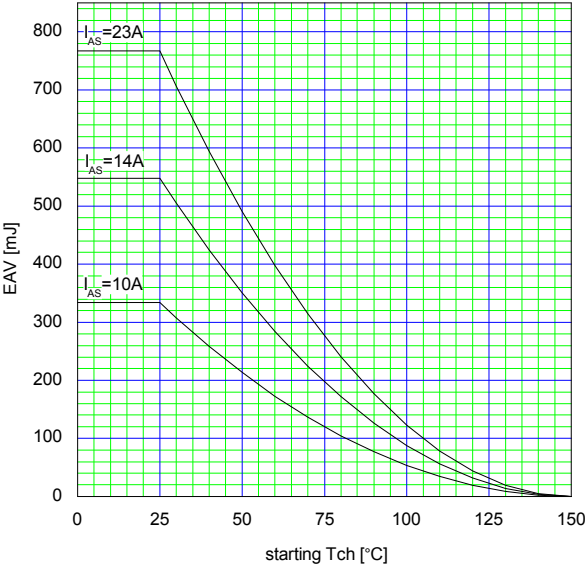
Typical Forward Characteristics of Reverse Diode
 $I_F = f(V_{SD}): 80\mu s$ pulse test, $T_{ch} = 25^{\circ}C$



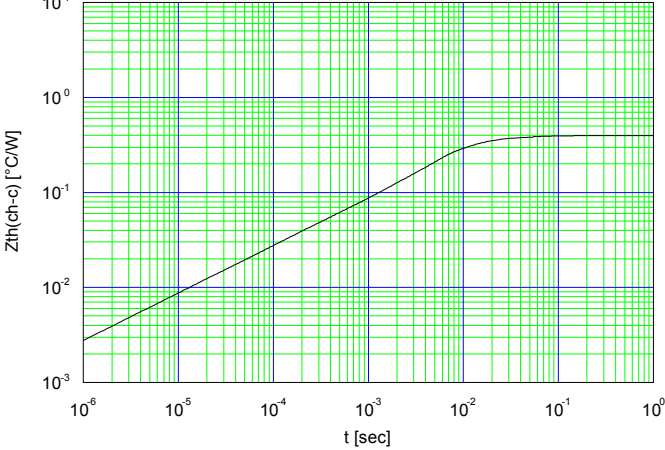
Typical Switching Characteristics vs. I_D
 $t = f(I_D): V_{CC} = 300V, V_{GS} = 10V, R_G = 5.6\Omega$



Maximum Avalanche Energy vs. starting Tch
 $E(AV)=f(\text{starting Tch}):V_{cc}=50V, I(AV)\leq 23A$



Maximum Transient Thermal Impedance
 $Z_{th}(ch-c)=f(t):D=0$



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