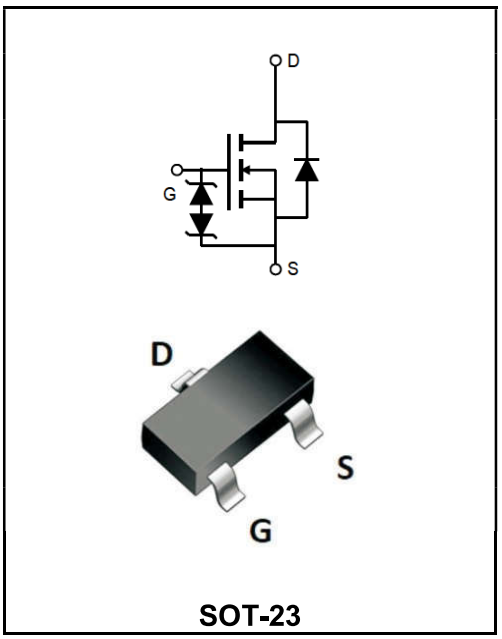
N-Channel Enhancement Mode Field Effect Transistor

MAIN CHARACTERISTICS

$V_{(BR)DSS}$	$R_{DS(ON)}$MAX	I_D
20V	22mΩ@4.5V	6.5A
	26mΩ@2.5V	
	34mΩ@1.8V	



SOT-23

Features

- High dense cell design for extremely low RDS(on).
- Exceptional on-resistance and maximum DC current capability.
- Load/Power Switching.
- Interfacing Switching.

Mechanical Data

- SOT-23 Small Outline Plastic Package.
- Epoxy UL: 94V-0.
- Mounting Position: Any.

Marking Code	
YFW3416	3416

Maximum Ratings & Thermal Characteristics

Ratings at 25℃ ambient temperature unless otherwise specified.

Parameters	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±8	V
Continuous Drain Current	I_D	6.5	A
Drain Current-Pulsed(note 1)	I_{DM}	30	
Pulsed Drain Current	P_D	1.4	W
Junction Temperature	T_j	-55-+150	℃
Storage Temperature	Tstg	-55-+150	℃
Thermal Resistance From Junction to Ambient $t \leq 10s$	$R_{\theta JA}$	70-90	℃/W
Thermal Resistance From Junction to Ambient Steady-State		100-125	℃/W
Maximum Junction-to-Lead Steady-State	$R_{\theta JL}$	63-80	℃/W

Electrical Characteristics

Ratings at 25℃ ambient temperature unless otherwise specified

Parameter	Symbols	Test Condition	Limits			Unit
			Min	Typ	Max	
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	V(BR)DSS	VGS=0V, ID=250uA	20			V
Zero Gate Voltage Drain current	IDSS	VDS=20V, VGS=0V			1	uA
Gate-body Leakage	IGSS	VDS=±8V, VDS=0V			±10	uA
On state drain current	ID(ON)	VGS=4.5V, VDS=5V	30			A
Static Drain-Source On-Resistance	RDS(ON)	VGS=4.5V, ID=6.5A		16	22	mΩ
		VGS=2.5V, ID=5.5A		18	26	
		VGS=1.8V, ID=5A		21	34	
Forward trans conductance	gfs	VDS=5V, ID=6.5A		50		S
Gate-Threshold voltage*	VGS (th)	VDS=VGS, ID=250uA	0.4	0.7	1.1	V
Diode Forward Voltage	VSD	IS=1A,VGS=0V		0.62	1	V
Maximum Body-Diode Continuous Current	IS				2	A
DYNAMIC PARAMETERS						
Input capacitance	Ciss	VDS=10V, VGS=0V,f=1MHz		1295	1650	pF
Output capacitance	Coss			160		
Reverse Transfer capacitance	Crss			8587		
Gate resistance	Rg	VDS=0V, VGS=0V,f=1MHz		1.8		Ω
SWITCHING PARAMETERS						
Turn-on Time	td(on)	VGS=4.5V, RL=1.54Ω, VDS=10V, RGEN=3Ω		280		nS
Rise time	tr			328		
Turn-off Time	td(off)			3.76		
Fall time	tf			2.24		
Total Gate Charge	Qg	VGS=4.5V, VDS=10V, ID=6.5A		10		nC
Gate Source Charge	Qgs			4.2		
Gate Drain Charge	Qgd			2.6		
Body Diode Reverse Recovery Time	trr	IF=6.5A, dI/dt=100A/ms		31	41	nS
Body Diode Reverse Recovery Charge	Qrr	IF=6.5A, dI/dt=100A/ms		6.8		nC

A. The value of RqJA is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C. The value in any given application depends on the user's specific board design.

B. The power dissipation PD is based on TJ(MAX)=150° C, using ≤ 10s junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature TJ(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initialTJ=25°C.

D. The RqJA is the sum of the thermal impedence from junction to lead RqJL and lead to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300ms pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-ambient thermal impedence which is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, assuming a maximum junction temperature of TJ(MAX)=150°C. The SOA curve provides a single pulse rating.

Typical characteristics

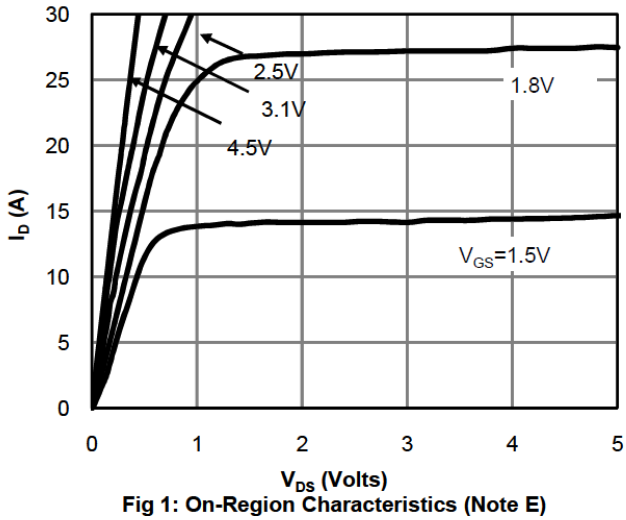


Fig 1: On-Region Characteristics (Note E)

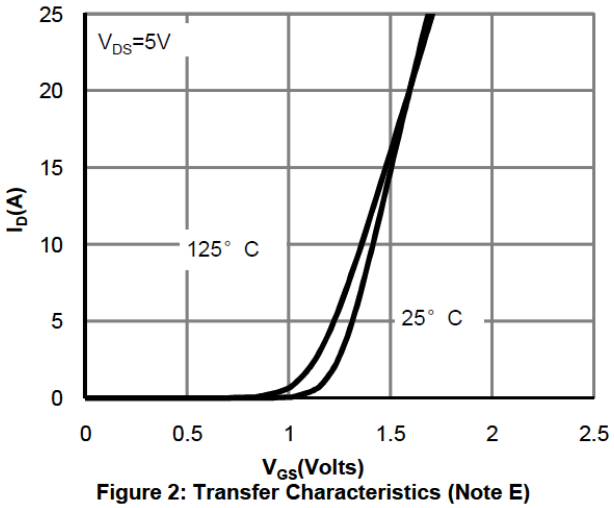


Figure 2: Transfer Characteristics (Note E)

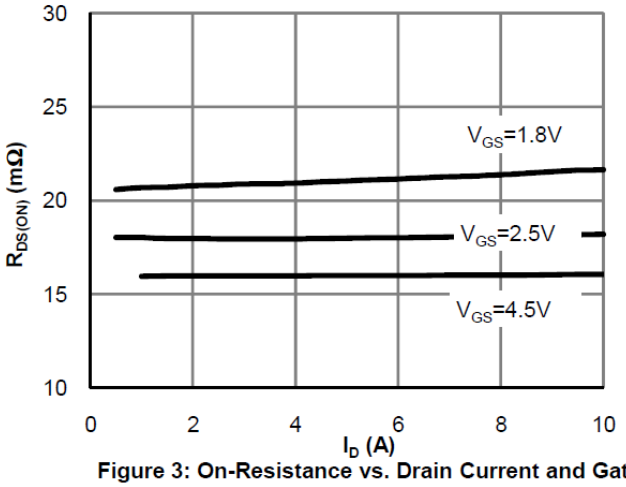


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

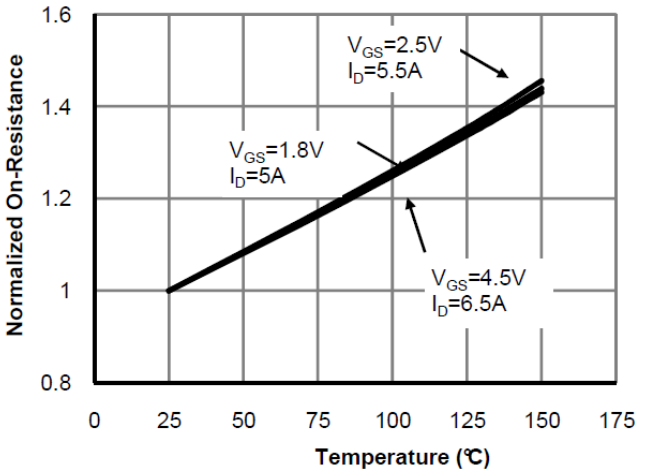


Figure 4: On-Resistance vs. Junction Temperature (Note E)

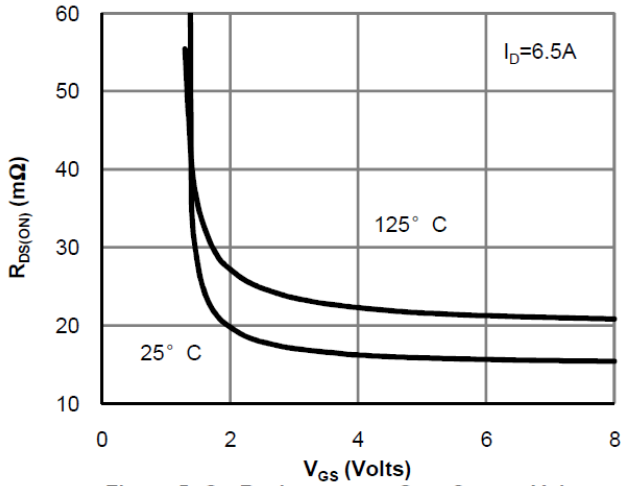


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

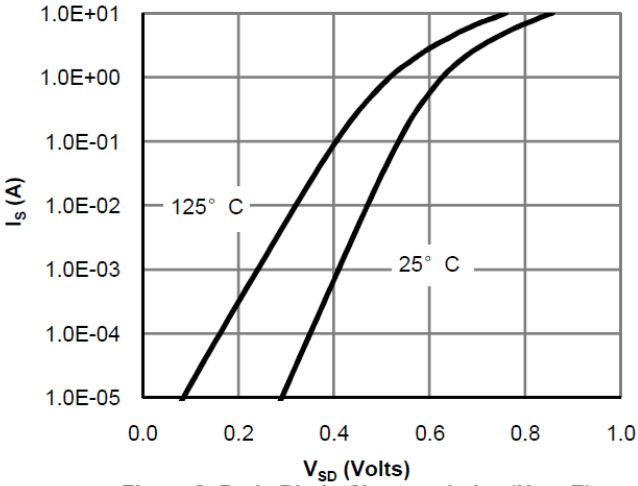


Figure 6: Body-Diode Characteristics (Note E)

Typical characteristics

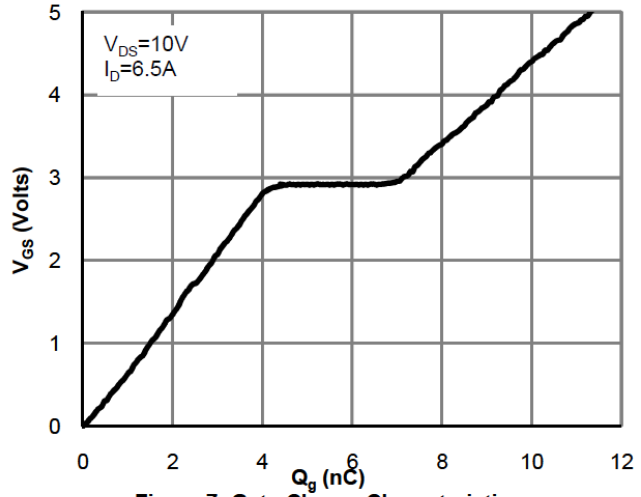


Figure 7: Gate-Charge Characteristics

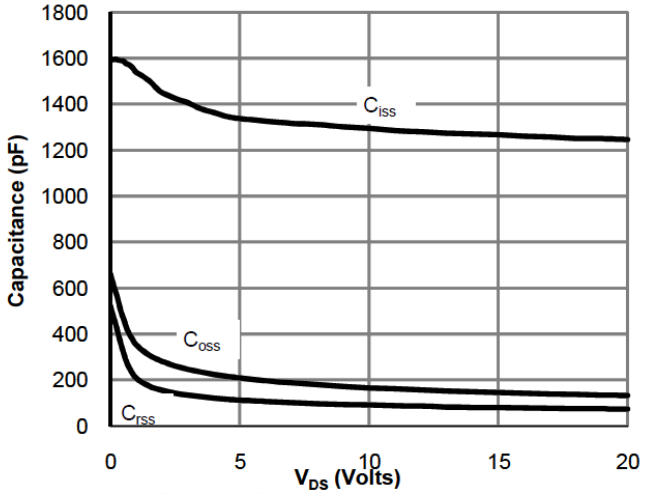


Figure 8: Capacitance Characteristics

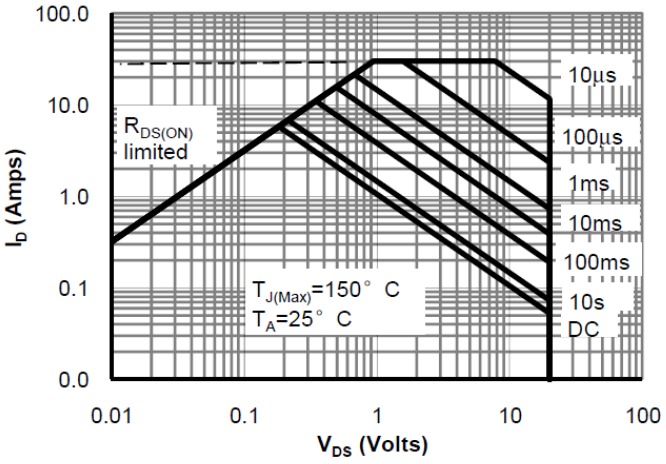


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

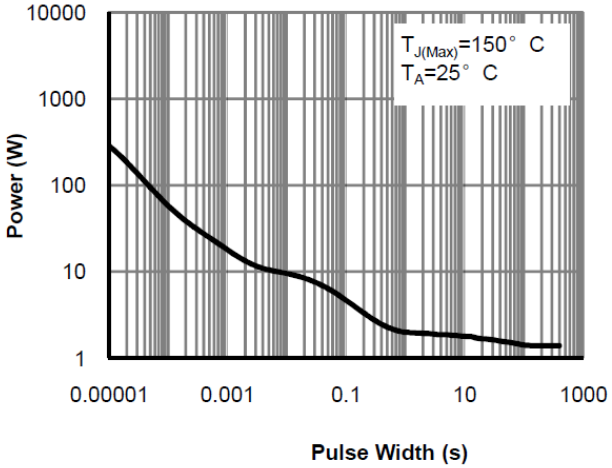


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

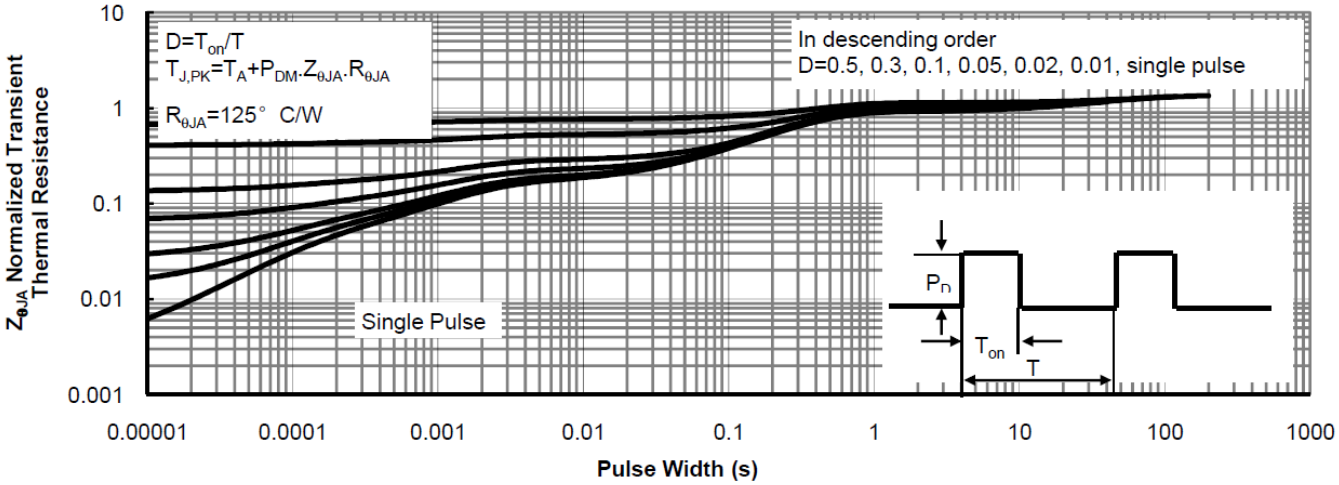
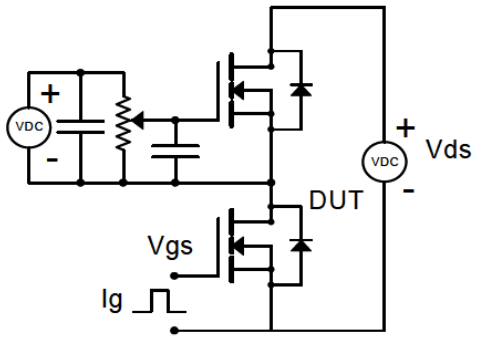
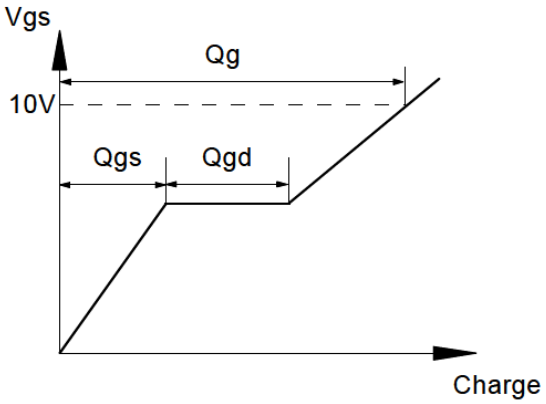


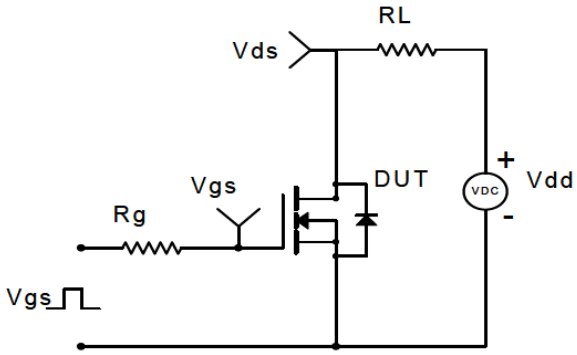
Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

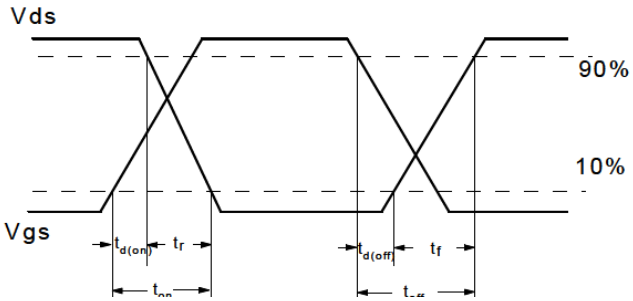
Gate Charge Test Circuit & Waveform



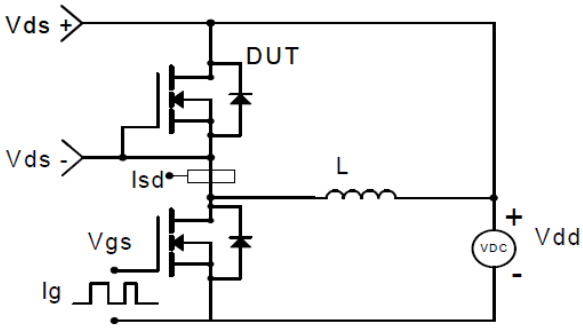


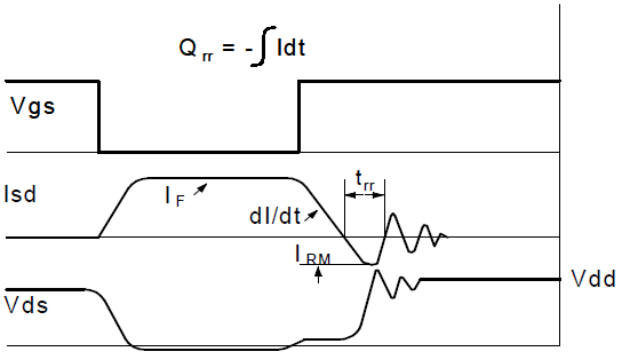
Resistive Switching Test Circuit & Waveforms





Diode Recovery Test Circuit & Waveforms



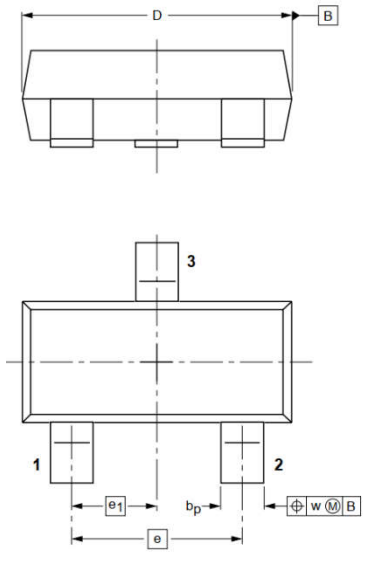


Ordering information

Package	Packing Description	Base Quantity	Packing Quantity
SOT-23	Tape/Reel,7"reel	3000pcs/Reel	24000PCS/Box 120000PCS/Carton

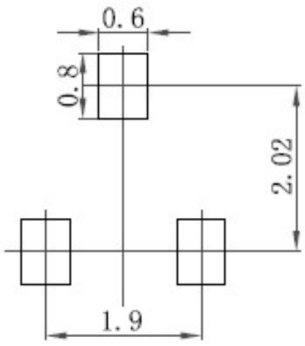
Package Dimensions

SOT-23



Dim.	Millimeter (mm)		mil	
	Min.	Max.	Min.	Max.
A	0.9	1.15	35	45
A1	0.1		3.9	
bp	0.38	0.48	15	19
C	0.09	0.15	3.54	5.9
D	2.8	3.0	110	118
E	1.2	1.4	47	55
E	1.9		75	
E1	0.95		37	
HE	2.1	2.55	83	100
Lp	0.15	0.45	5.9	18
Q	0.45	0.55	18	22
v	0.2		7.9	
W	0.1		4	

The recommended mounting pad size



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