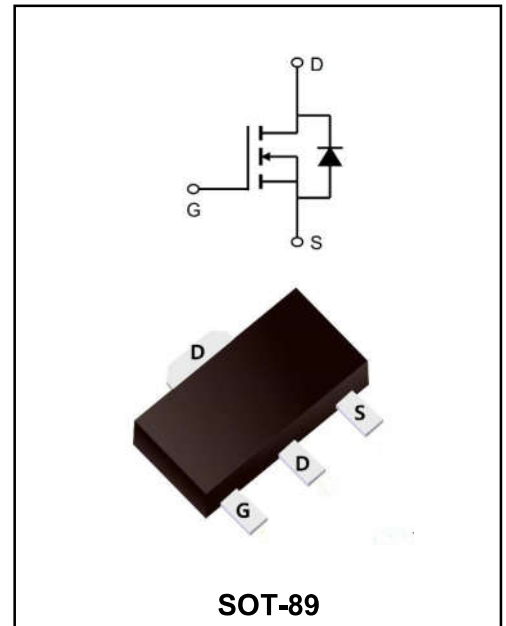


40V N-Channel Enhancement Mode Field Effect Transistor

MAIN CHARACTERISTICS

I_D	20A
V_{DS}	40V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$<20m\Omega$ (Typ:14.5mΩ)
$R_{DS(on)-typ}(@V_{GS}=4.5V)$	$<30m\Omega$ (Typ:18mΩ)



Marking Code	
YFW20N04SI	YFW20N04

FEATURES

- ◆Lead free product is acquired
- ◆High density cell design for ultra low RDS(on)
- ◆Good stability and uniformity with high EAS
- ◆Power Management
- ◆Excellent package for good heat dissipation
- ◆Power switching application
- ◆Hard switching and high frequency circuits
- ◆Uninterruptible power supply

Absolute Maximum Ratings ($T_a=25^{\circ}C$ unless otherwise noted)

Parameter		Symbols	Value	Units
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_A=25^{\circ}C$	I_D	30	A
	$T_A=100^{\circ}C$		18	A
Pulsed Drain Current (Note 1)		IDM	114	A
Single Pulse Avalanche Energy (Note 2)		EAS	30	mJ
Power Dissipation		P_D	34.7	W
Junction Temperature		T_J	-55-+150	$^{\circ}C$
Storage Temperature		T_{STG}	-55-+150	$^{\circ}C$
Thermal Resistance From Junction to Ambient (note 3)		$R_{\theta JA}$	3.6	$^{\circ}C/W$

Electrical Characteristics(Ta=25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	40			V
Zero Gate Voltage Drain current	$V_{DS}=40V, V_{GS}=0V$	I_{DSS}			1	μA
Gate-body Leakage	$V_{DS}=\pm 20V, V_{GS}=0V$	I_{GSS}			± 100	nA
Drain-Source On-Resistance (note 4)	$V_{GS}=10V, I_D=15A$	$R_{DS(ON)}$		14.5	20	m Ω
	$V_{GS}=4.5V, I_D=10A$			18	30	
Gate-Threshold voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1.0	1.3	1.7	V
Diode forward voltage	$I_S=10A, V_{GS}=0V$	V_{SD}			1.2	V
Input capacitance	$V_{DS}=20V, V_{GS}=0V, f=1MHz$	C_{iss}		1342		pF
Output capacitance		C_{oss}		87		
Reverse Transfer capacitance		C_{rss}		26		
Total Gate Charge	$V_{GS}=0$ to $10V$ $V_{DS}=20V$ $I_D=10A$	Q_g		26		nC
Gate Source Charge		Q_{gs}		6		
Gate Drain(Miller) Charge		Q_{gd}		5		
Turn-on Time	$V_{GS}=10V$ $I_D=10A$ $V_{DD}=20V$ $R_{GEN}=3\Omega$	$t_{d(on)}$		7		ns
Rise time		T_r		11		
Turn-off Time		$t_{d(OFF)}$		26		
Fall time		t_f		5		
Body Diode Reverse Recovery Time	$I_F=10A, di/dt=100A/\mu s$	t_{rr}		10		ns
Body Diode Reverse Recovery Charge		Q_{rr}		6		nC

Notes:

- 1.Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
- 2.EAS condition: Starting $T_J=25^\circ C$, $V_{DD}=20V$, $V_G=10V$, $R_G=25\Omega$, $L=0.5mH$, $I_{AS}=11A$
3. $R_{\theta JA}$ is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB
- 4.Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Typical Performance Characteristics

Figure 1: Output Characteristics

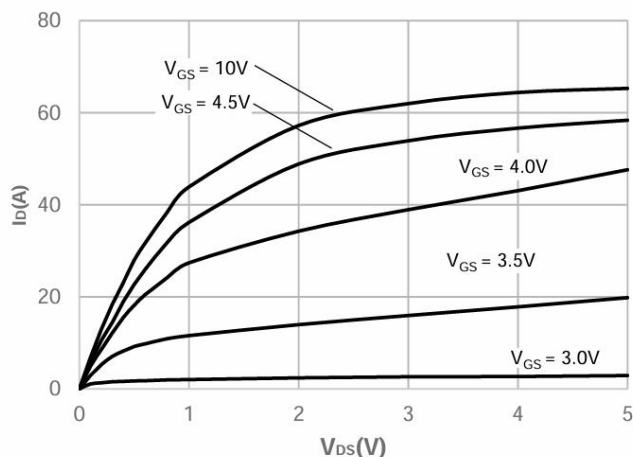


Figure 2: Typical Transfer Characteristics

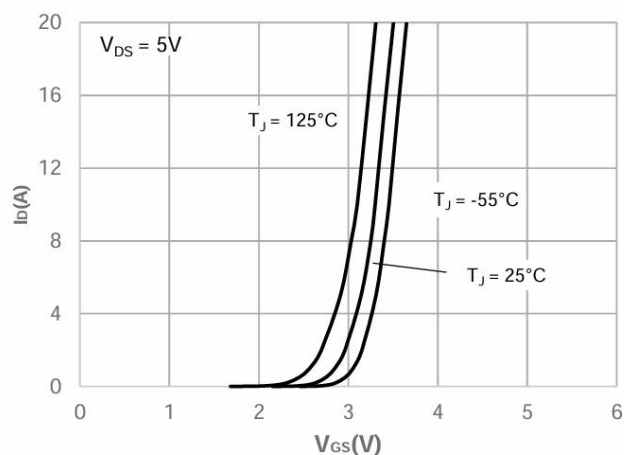


Figure 3: On-resistance vs. Drain Current

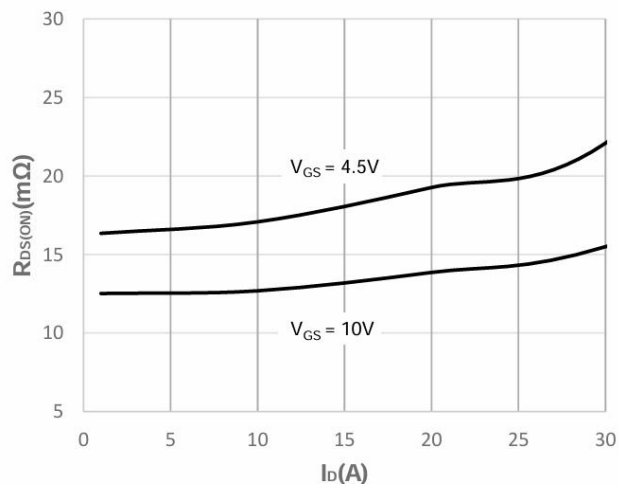


Figure 4: Body Diode Characteristics

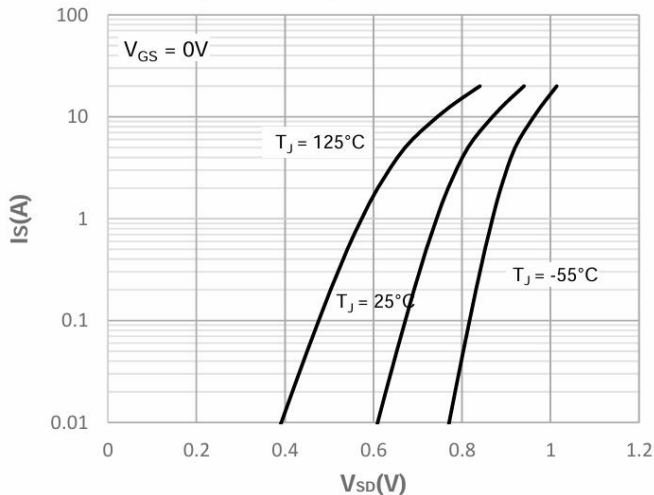


Figure 5: Gate Charge Characteristics

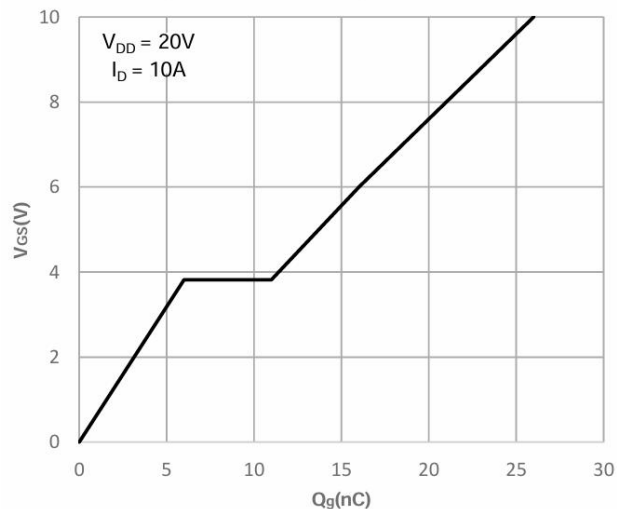


Figure 6: Capacitance Characteristics

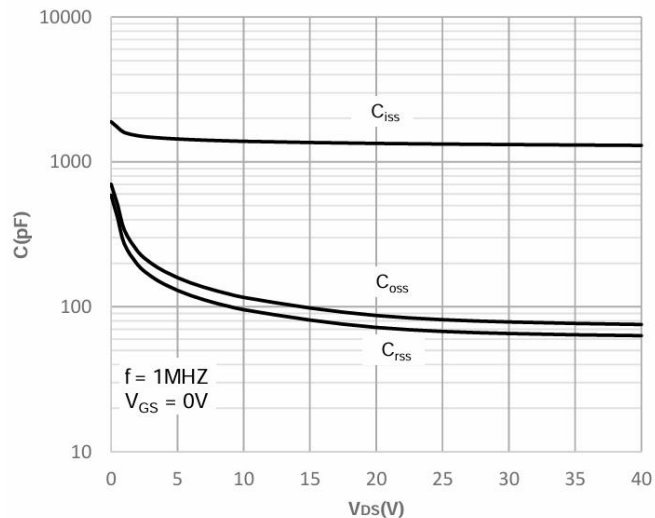


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

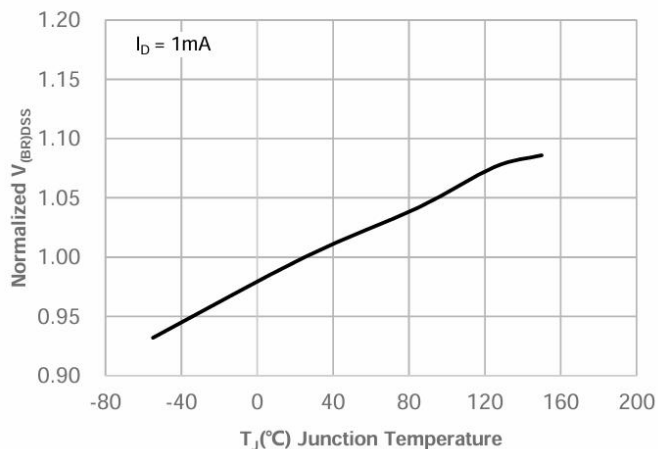


Figure 8: Normalized on Resistance vs. Junction Temperature

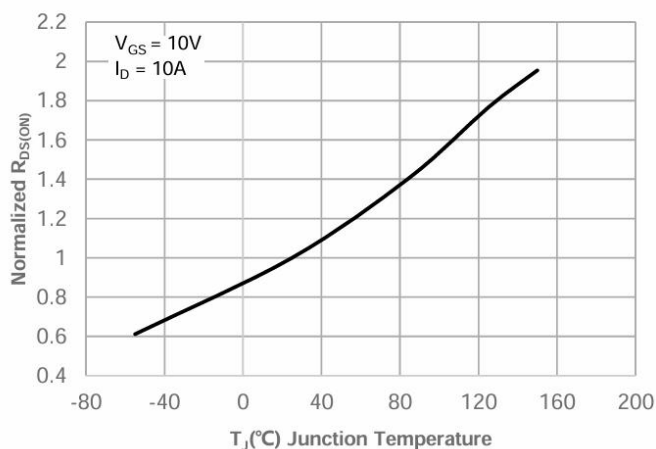


Figure 9: Maximum Safe Operating Area

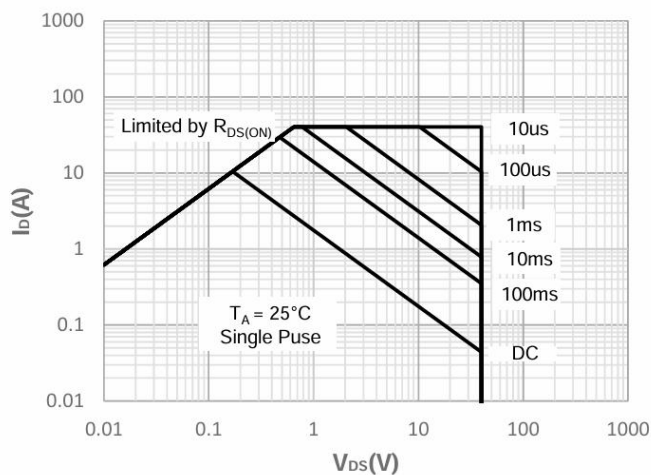


Figure 10: Maximum Continuous Driant Current vs. Ambient Temperature

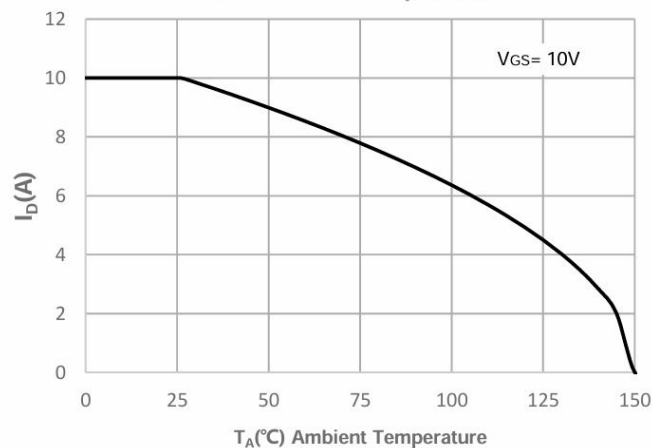


Figure 11: Normalized Maximum Transient Thermal Impedance

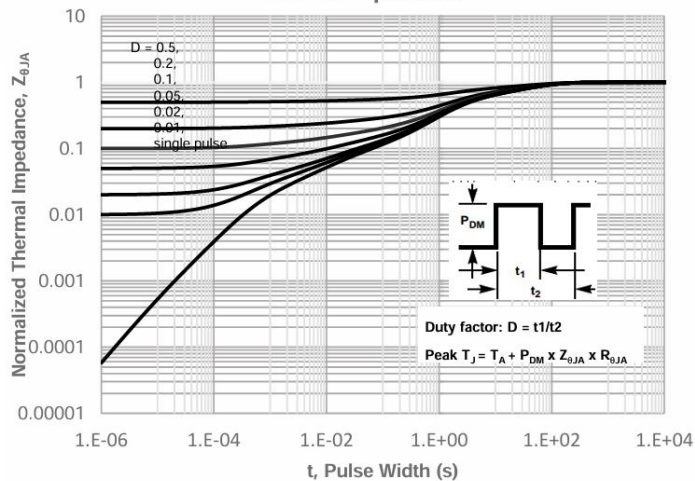
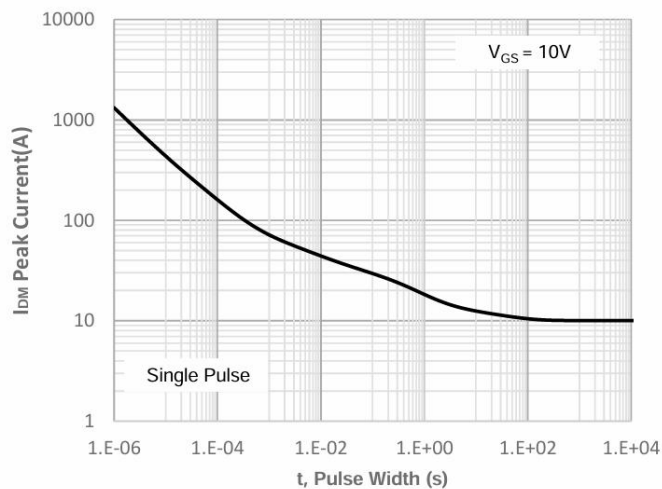


Figure 12: Peak Current Capacity



Ordering information

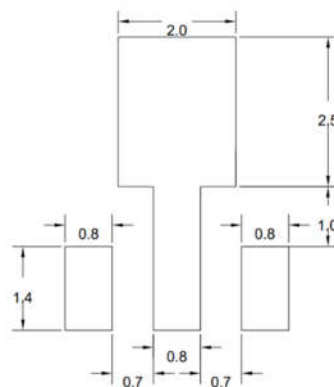
Package	Packing Description	Base Quantity	Packing Quantity
SOT-89	Tape/Reel, 7" reel	1000pcs/Reel	6000PCS/Box 30000PCS/Carton

Package Dimensions

SOT-89

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	1.40	1.60	0.055	0.063
b	0.32	0.52	0.013	0.020
b1	0.38	0.58	0.015	0.023
c	0.35	0.45	0.014	0.018
D	4.40	4.60	0.173	0.181
D1	1.45	1.65	0.057	0.065
D2	1.70	1.80	0.067	0.071
E	2.30	2.60	0.091	0.102
E1	3.95	4.25	0.156	0.167
E2	1.80	2.00	0.071	0.079
e	1.40	1.60	0.055	0.063
e1	2.80	3.20	0.110	0.126
L	0.90	1.20	0.035	0.047

The recommended mounting pad size



UNIT:MM

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