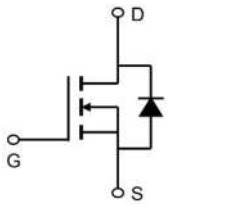
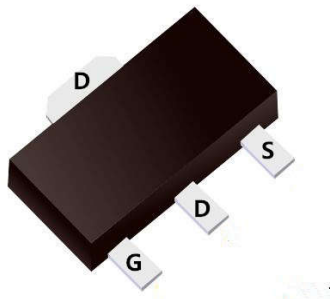
40V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	6A
V_{DSS}	40V
R_{DSON}-typ(@V_{GS}=10V)	< 40mΩ(Type:28 mΩ)





SOT-89

Application

- Wireless charging
- Boost driver
- LED

Marking Code	
YFW6N04SI	YFW6N04SI

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	40	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current, V_{GS} @ 10V[1] @T_A=25℃	I_D	6	A
Continuous Drain Current, V_{GS} @ 10V[1]@T_A=70℃	I_D	4.9	A
Pulsed Drain Current[2]	I_{DM}	18	A
Single Pulse Avalanche Energy[3]	E_{AS}	16.2	mJ
Total Power Dissipation[4] @T_A=25℃	P_D	1.67	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C
Thermal Resistance, Junction-to-Ambient [1]	$R_{\theta JA}$	125	°C/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	30	°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	BV_{DSS}	40	44	-	V
BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	$\Delta BV_{DSS/\Delta TJ}$	-	0.032	-	V/°C
Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=4A	$R_{DS(ON)}$	-	28	40	mΩ
	V_{GS}=4.5V, I_D=3A		-	35	50	
Gate -Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	$V_{GS(th)}$	1.0	1.5	2.5	V
VGS(th) Temperature Coefficient		$\Delta V_{GS(th)}$	-	-4.5	-	mV/°C
Drain-Source Leakage Current	V_{DS}=32V , V_{GS}=0V , T_J=25℃	I_{DSS}	-	-	1	μA
	V_{DS}=32V , V_{GS}=0V , T_J=55℃		-	-	5	
Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	-	-	±100	nA
Forward Transconductance	V_{DS}=5V, I_D=4A	g_{FS}	-	8	-	S
Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	R_g	-	2.4	4.8	Ω
Total Gate Charge(4.5V)	V_{DS}=15V V_{GS}=4.5V I_D=3A	Q_g	-	5	-	nC
Gate-Source Charge		Q_{gs}	-	1.54	-	
Gate-Drain Charge		Q_{gd}	-	1.84	-	
Turn-on delay time	V_{DD}=15V V_{GS}=10V R_G=3.3Ω I_D=1A	$t_{d(on)}$	-	7.8	-	ns
Rise Time		T_r	-	2.1	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	29	-	
Fall Time		t_f	-	2.1	-	
Input Capacitance	V_{DS}=15V V_{GS}=0V f=1.0MHz	C_{iss}	-	452	-	pF
Output Capacitance		C_{oss}	-	51	-	
Reverse Transfer Capacitance		C_{rss}	-	38	-	
Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	I_S	-	-	4.5	A
Pulsed Source Current[2,4]		I_{SM}	-	-	14	A
Diode Forward Voltage [2]	V_{GS}=0V , I_S=1A , T_J=25℃	V_{SD}	-	-	1.2	V

Note :
1、The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3、The power dissipation is limited by 150℃ junction temperature
4、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Ratings and Characteristic Curves

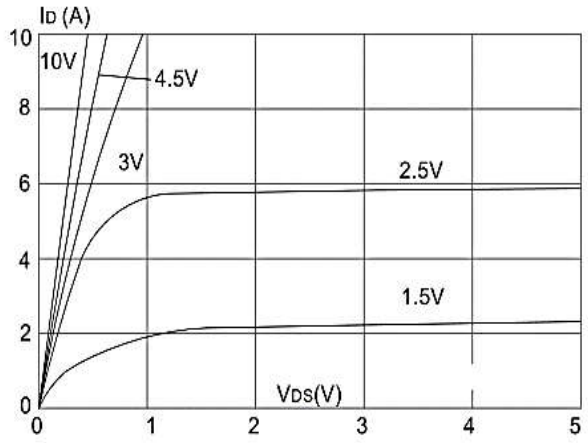


Figure1: Output Characteristics

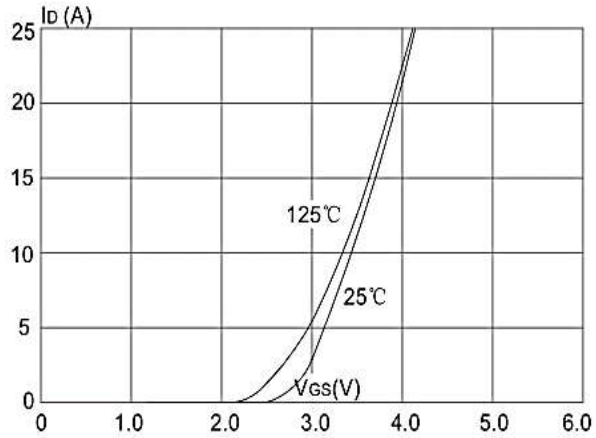


Figure 2: Typical Transfer Characteristics

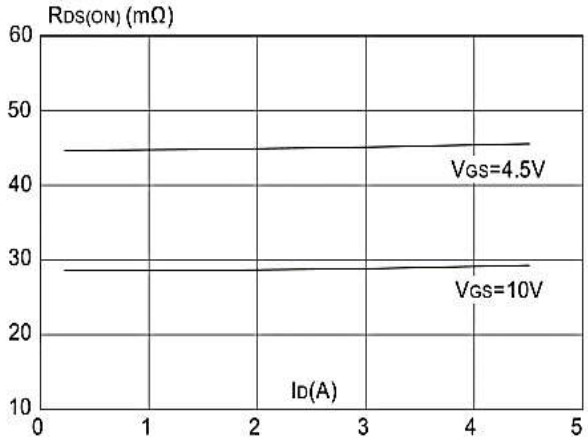


Figure 3:On-resistance vs. Drain Current

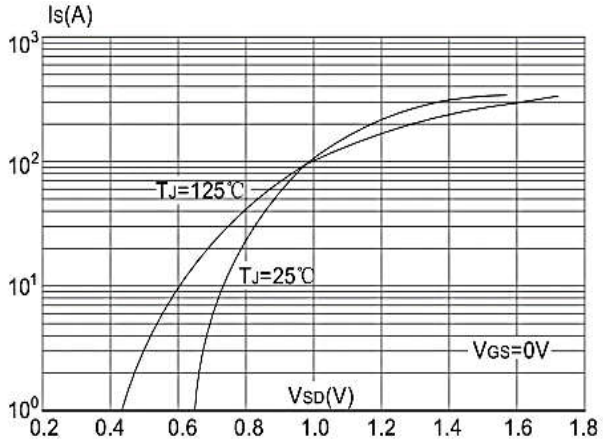


Figure 4: Body Diode Characteristics

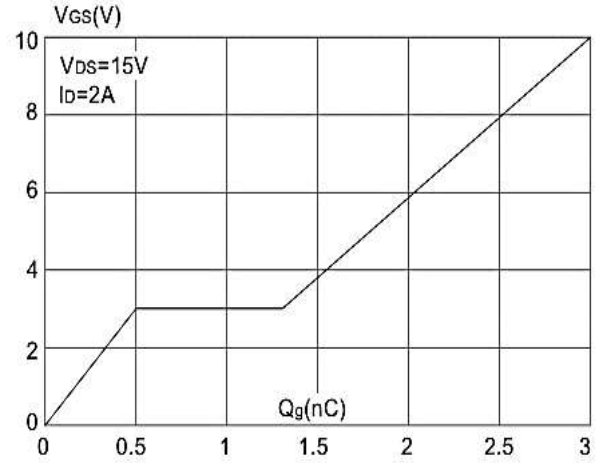


Figure 5: Gate Charge Characteristics

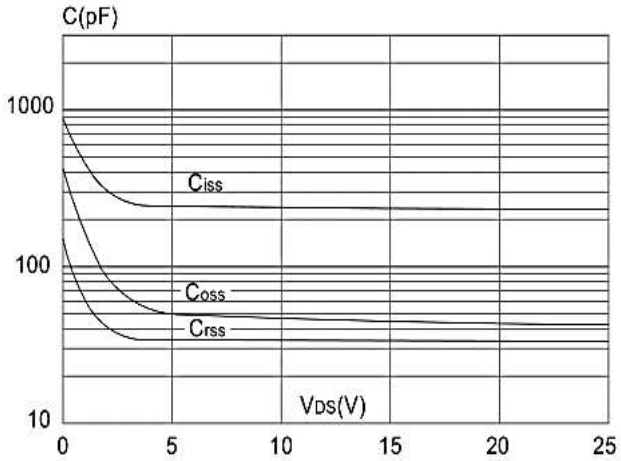


Figure 6: Capacitance Characteristics

Ratings and Characteristic Curves

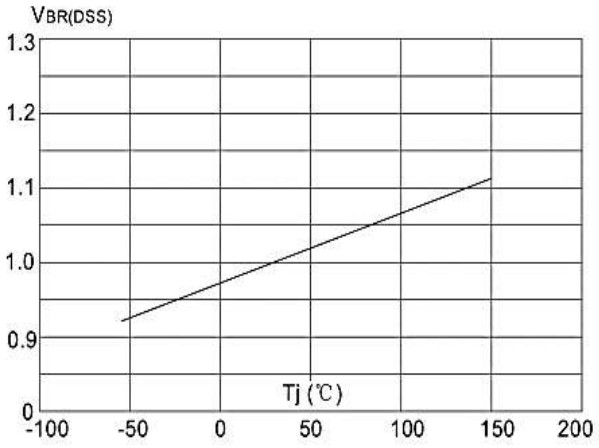


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

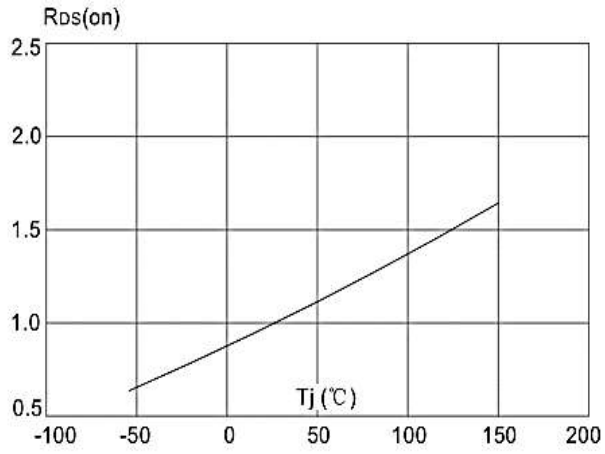


Figure 8: Normalized on Resistance vs Junction Temperature

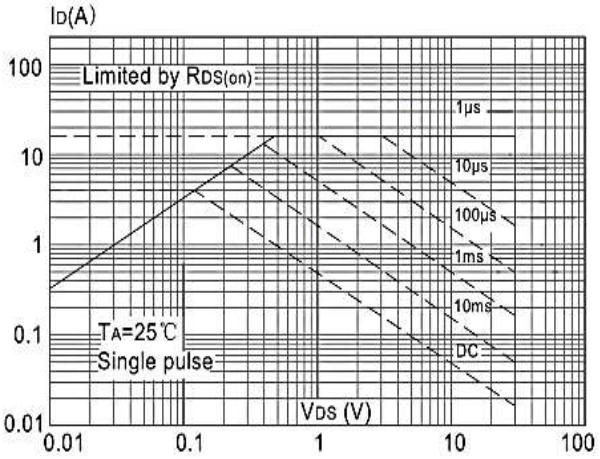


Figure 9: Maximum Safe Operating Area vs. Case Temperature

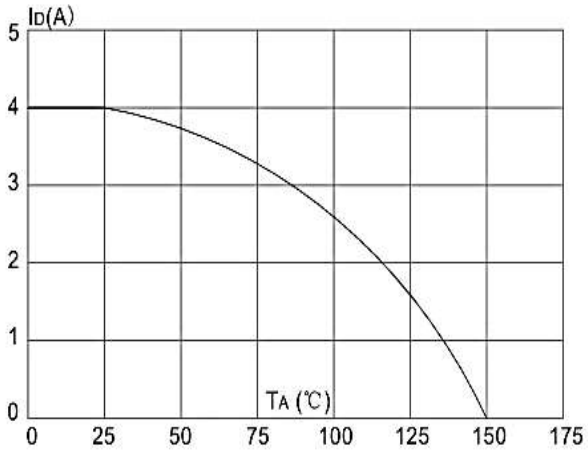


Figure 10: Maximum Continuous Drain Current

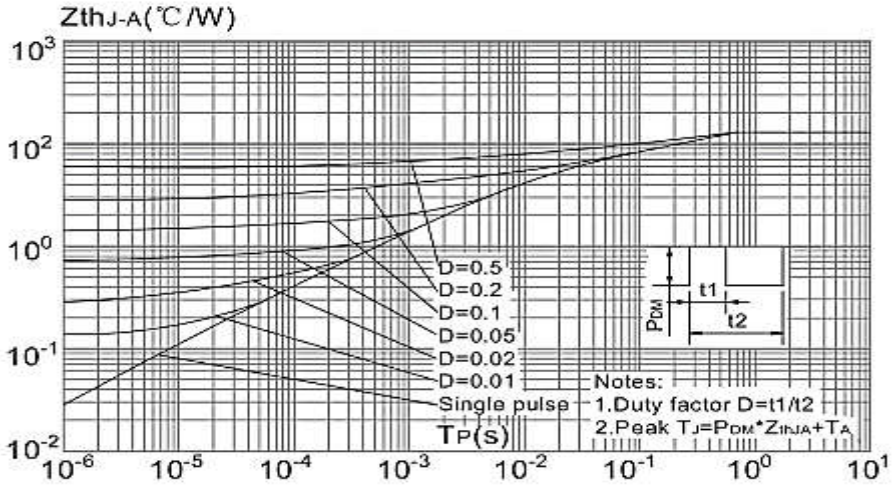


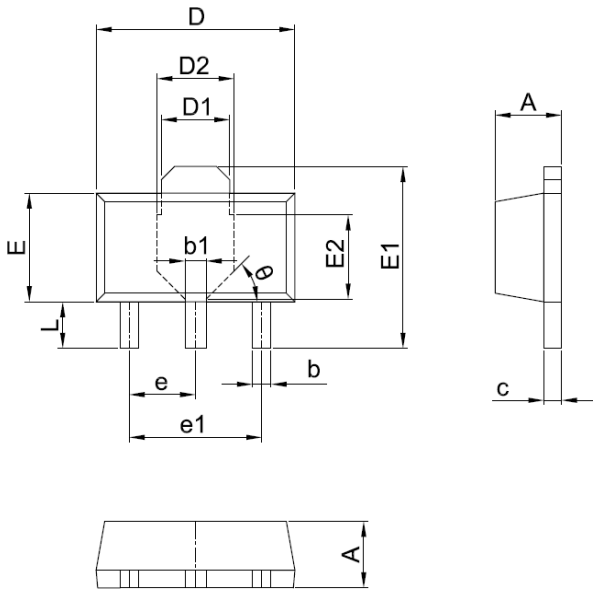
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Ordering information

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

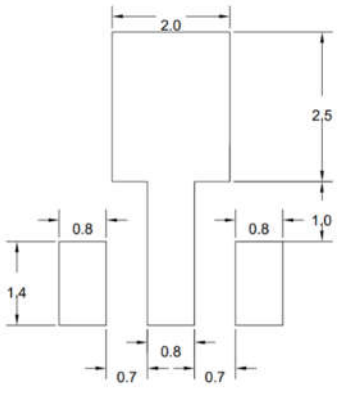
Package Dimensions

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



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