● General Description

The CH10P04A combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.

● Features

■ Advance high cell density Trench technology

■ Low $R_{DS(ON)}$ to minimize conductive loss

■ Low Gate Charge for fast switching

■ Low Thermal resistance

● Application

■ MB/VGA Vcore

■ SMPS 2nd Synchronous Rectifier

■ POL application

■ BLDC Motor driver

● Product Summary

$V_{DS} = -40V$

$R_{DS(ON)} = 33m\Omega$

$I_D = -10A$

SOT-89-3L

1. GATE
2. DRAIN
3. SOURCE

● Ordering Information:

Part NO.	CH10P04A
Marking	CH10P04A
Packing Information	REEL TAPE
Basic ordering unit (pcs)	1000

● Absolute Maximum Ratings ($T_C = 25°C$)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D@TC=25℃	-10	A
	I_D@TC=75℃	- 6	A
	I_D@TC=100℃	-4	A
Pulsed Drain Current [①]	I_{DM}	-28	A
Total Power Dissipation	P_D@TC=25℃	4.0	W
Total Power Dissipation	P_D@TA=25℃	1.2	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy	E_{AS}	160	mJ
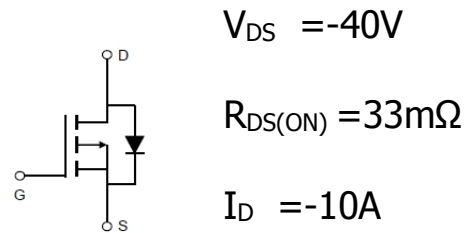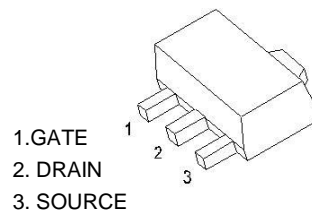
●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	2.3	°C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	27	°C/W
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	265	°C

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250uA$	-40			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=-250uA$	-1.0	-1.6	-2.5	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-40V, V_{GS}=0V$			-1.0	uA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm20V, V_{DS}=0V$			±100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-5A$		33	43	mΩ
		$V_{GS}=-4.5V, I_D=-3A$		44	60	mΩ
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_D=-5A$		10		s
Source-drain voltage	V_{SD}	$Is=-5A$			1.28	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}		-	1034	-	
Output capacitance	C_{oss}	f = 1MHz	-	107	-	pF
Reverse transfer capacitance	C_{rss}		-	79.5	-	

●Gate Charge characteristics(T_a = 25℃)

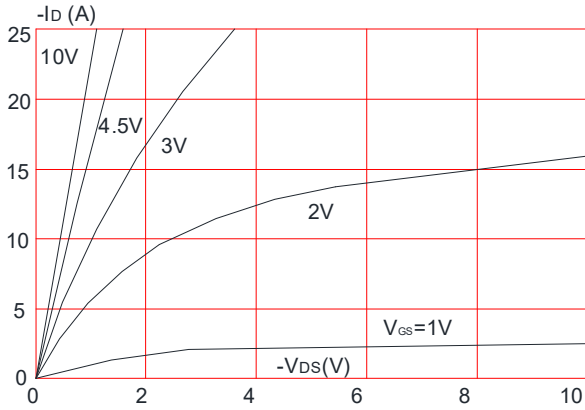| Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	$V_{DD}=-20V$	-	20	-	
Gate - Source charge	Q_{gs}	$I_D=-5A$	-	3.5	-	nC
Gate - Drain charge	Q_{gd}	$V_{GS}=-10V$	-	3.3	-	

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: $T_J=25℃$, $V_{DD}=-20V$, $V_G=-10V$, L=0.5mH, $R_G=25Ω$, $I_{AS}=-10A$
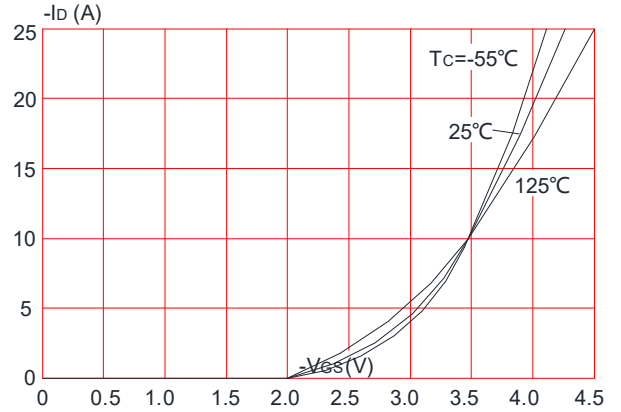
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%
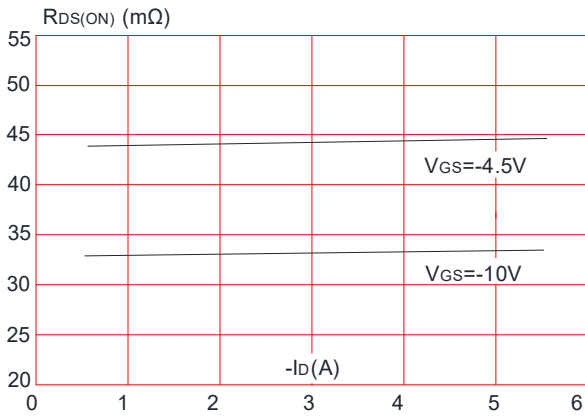
Typical Performance Characteristics
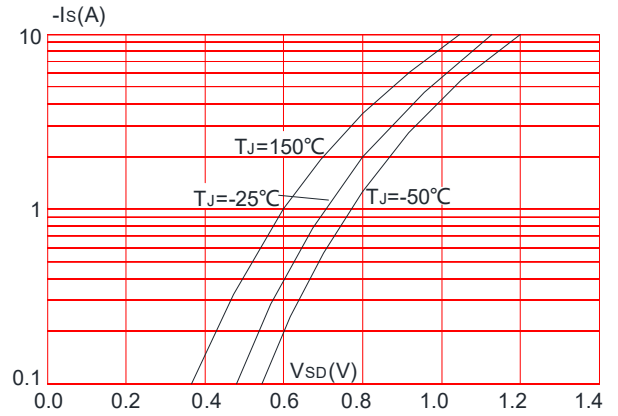
Figure1: Output Characteristics

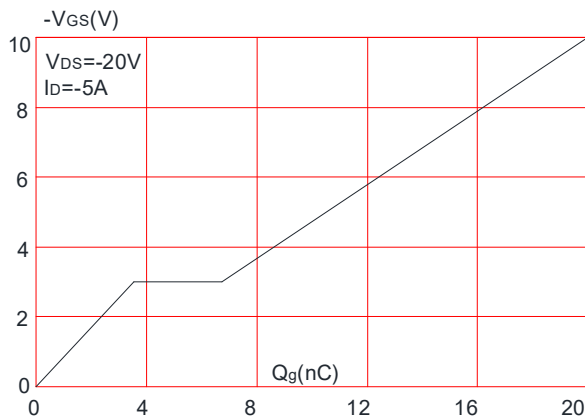**Figure 2:** Typical Transfer Characteristics

Figure 3: On-resistance vs. Drain Current
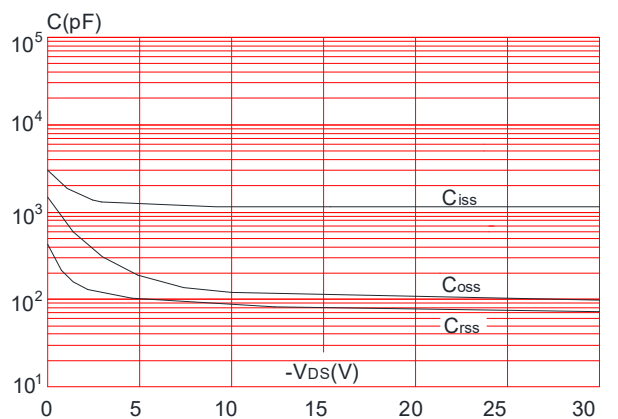

Figure 4: Body Diode Characteristics
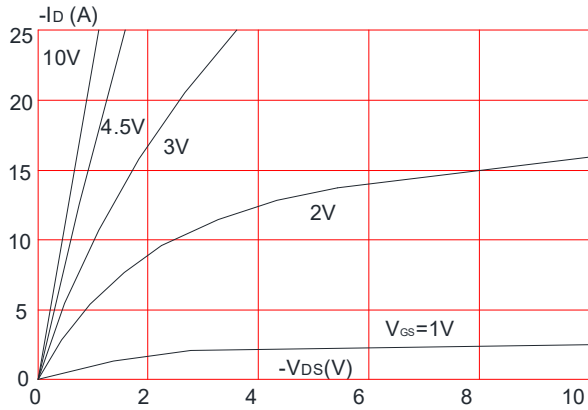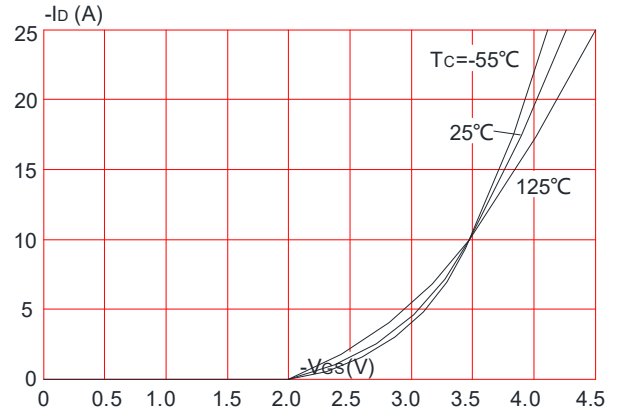

Figure 5: Gate Charge Characteristics

Figure 6: Capacitance Characteristics
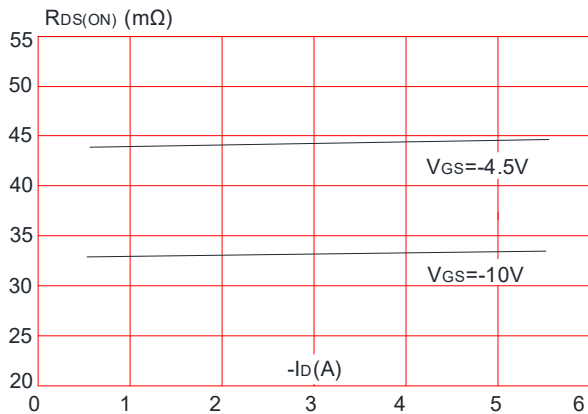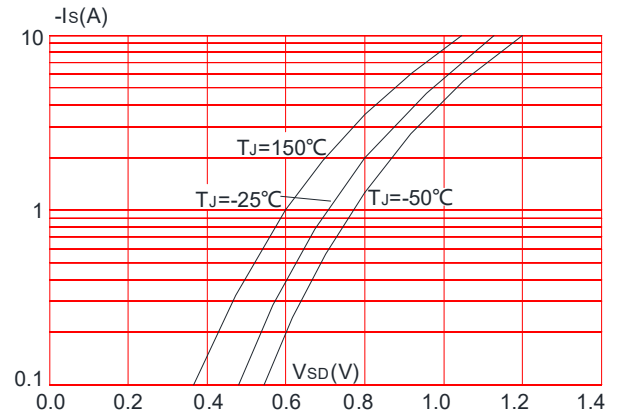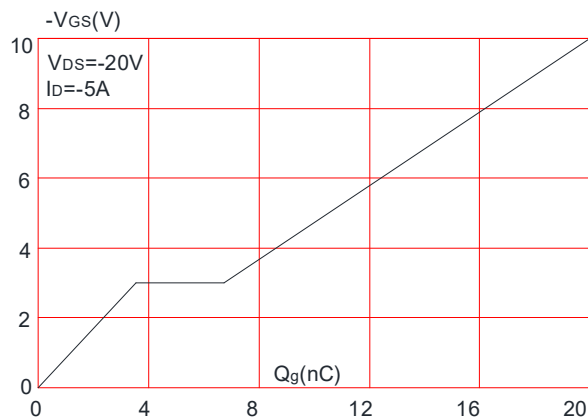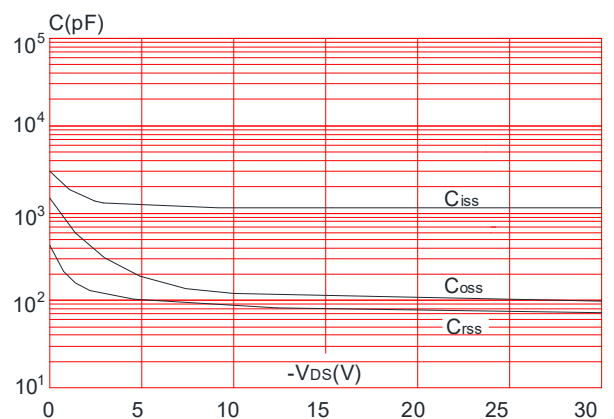
Typical Performance Characteristics

Figure1: Output Characteristics

Figure 2: Typical Transfer Characteristics

Figure 3: On-resistance vs. Drain Current
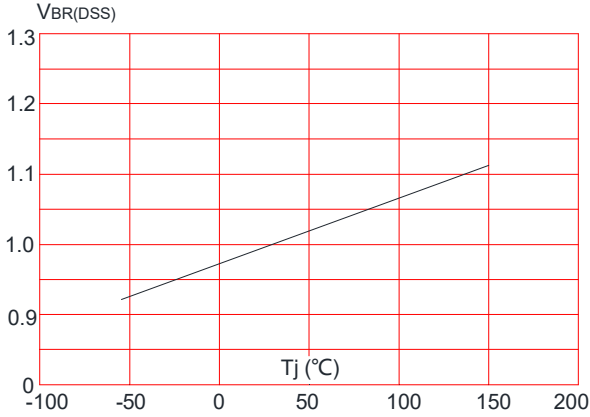

Figure 4: Body Diode Characteristics

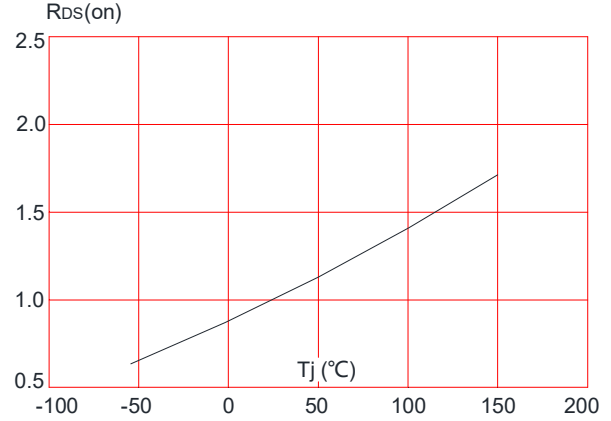**Figure 5:** Gate Charge Characteristics

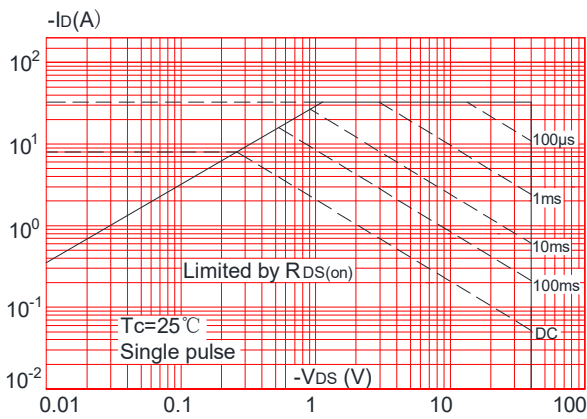**Figure 6:** Capacitance Characteristics

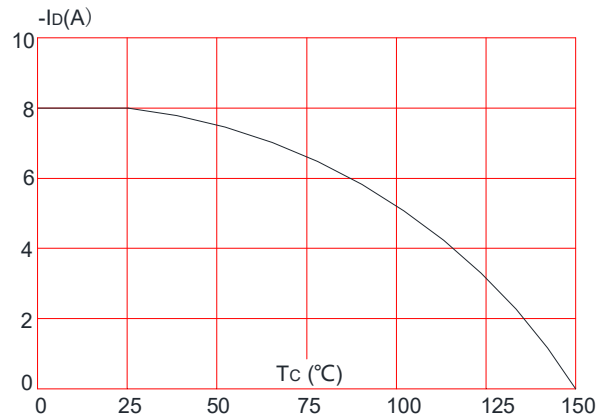**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature

Figure 8: Normalized on Resistance vs. Junction Temperature
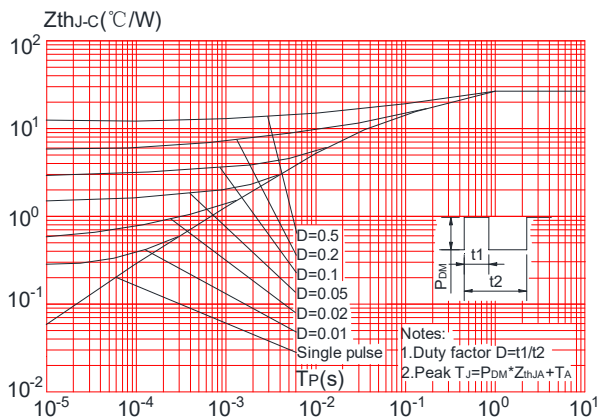

Figure 9: Maximum Safe Operating Area
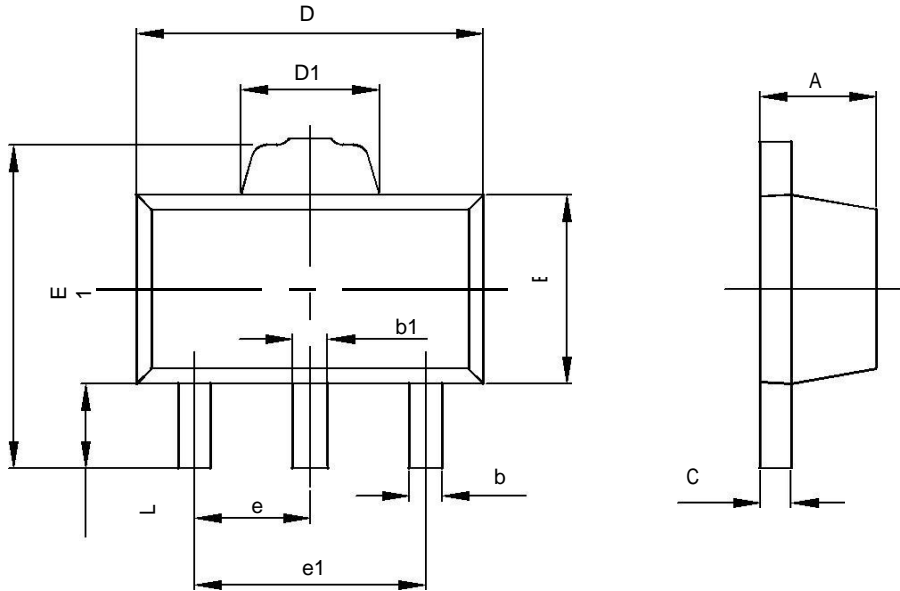

Figure 10: Maximum Continuous Drain Current vs. Case Temperature

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

Notes:
1. Duty factor $D = t_1/t_2$
2. Peak $T_J = P_{DM} * Z_{thJA} + T_A$

SOT-89-3L PACKAGE OUTLINE DIMENSIONS

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.360	0.560	0.014	0.022
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.400	1.800	0.055	0.071
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500TYP		0.060TYP	
e1	2.900	3.100	0.114	0.122
L	0.900	1.100	0.035	0.043