

# MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



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GDT



PLED

## CSD17506Q5A-MS

Product specification

## Description

The CSD17506Q5A-MS uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

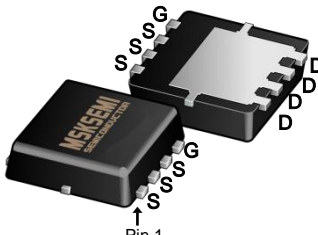
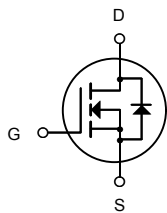

## Features

- $V_{DS} = 30V$   $I_D = 90A$
- $R_{DS(ON)} < 4.7m\Omega$   $V_{GS} = 10V$

## Application

- Battery protection
- Load switch
- Uninterruptible power supply

## Reference News

DFN5X6-8L	N-Channel MOSFET	Marking
		

## Absolute Maximum Ratings (T<sub>C</sub>=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	±20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ <sup>1</sup>	90	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ <sup>1</sup>	50	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	162	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	144.7	mJ
$I_{AS}$	Avalanche Current	53.8	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation <sup>4</sup>	62.5	W
$T_{STG}$	Storage Temperature Range	-55 to 150	°C
$T_J$	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>1</sup>	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	2.4	°C/W

**Electrical Characteristics** ( $T_J=25\text{ }^{\circ}\text{C}$ , unless otherwise noted)

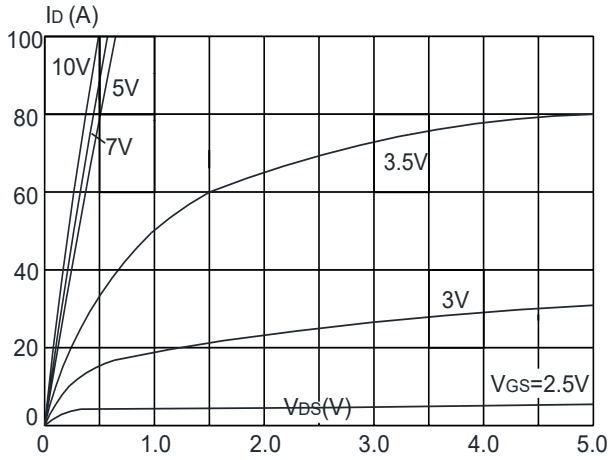
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V,$	-	-	1.0	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note3</small>	$V_{GS}=10V, I_D=30A$	-	3.5	4.7	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$	-	7.0	10	
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1.0MHz$	-	2100	-	pF
$C_{oss}$	Output Capacitance		-	326	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	282	-	pF
$Q_g$	Total Gate Charge	$V_{DS}=15V, I_D=30A, V_{GS}=10V$	-	45	-	nC
$Q_{gs}$	Gate-Source Charge		-	3	-	nC
$Q_{gd}$	Gate-Drain("Miller") Charge		-	15	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=15V, I_D=30A, R_{GEN}=3\Omega, V_{GS}=10V$	-	21	-	ns
$t_r$	Turn-on Rise Time		-	32	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	59	-	ns
$t_f$	Turn-off Fall Time		-	34	-	ns
$I_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	50	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	200	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=30A$	-	-	1.2	V
$t_{rr}$	Body Diode Reverse Recovery Time	$I_F=20A, dI/dt=100A/\mu s$	-	15	-	ns
$Q_{rr}$	Body Diode Reverse Recovery Charge		-	4	-	nC

**Notes:**

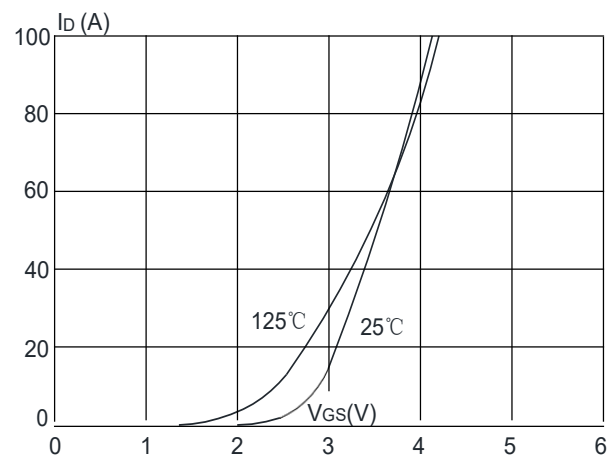
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition:  $T_J=25^{\circ}\text{C}$ ,  $V_G=10V$ ,  $R_G=25\Omega$ ,  $L=0.5mH$ ,  $I_{AS}=18.4A$
3. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 0.5\%$

## Typical Characteristics

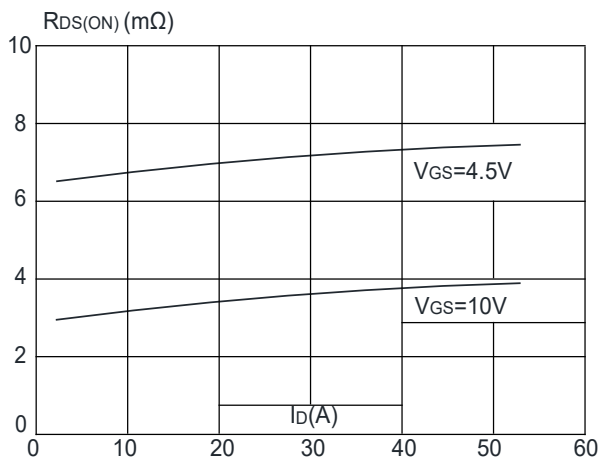
**Figure 1: Output Characteristics**



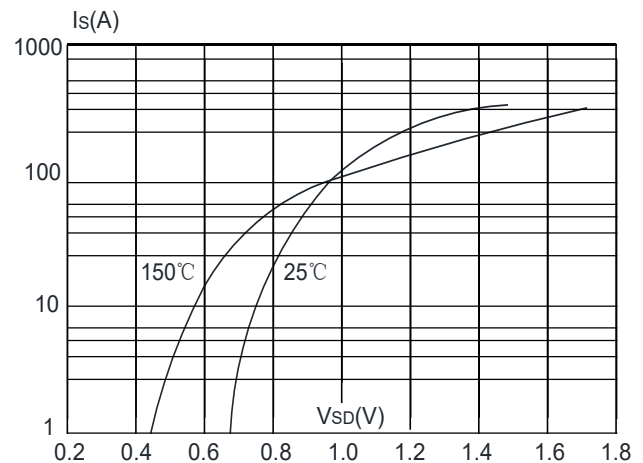
**Figure 2: Typical Transfer Characteristics**



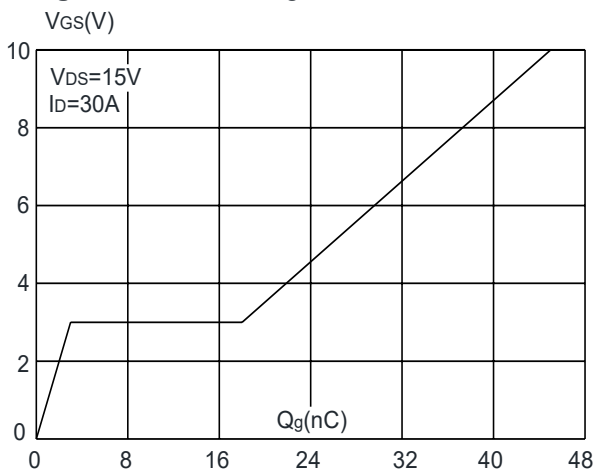
**Figure 3: On-resistance vs. Drain Current**



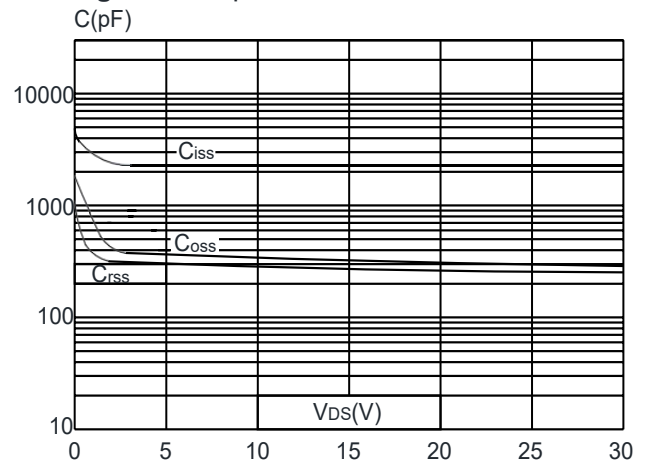
**Figure 4: Body Diode Characteristics**



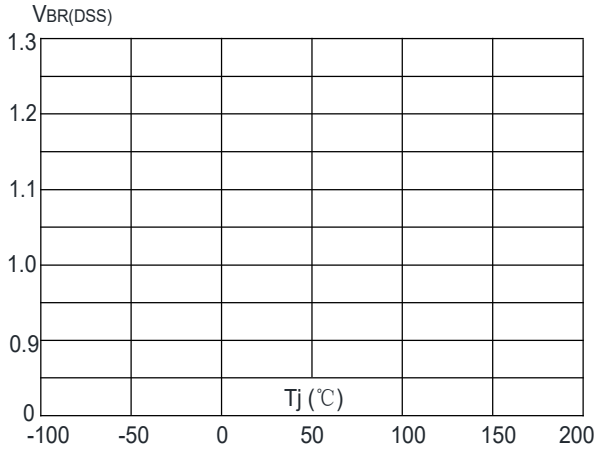
**Figure 5: Gate Charge Characteristics**



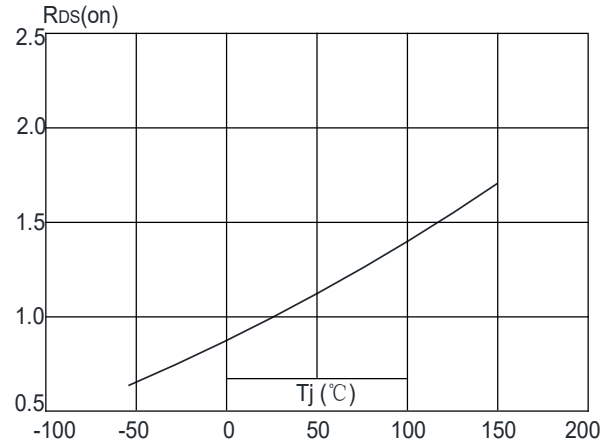
**Figure 6: Capacitance Characteristics**



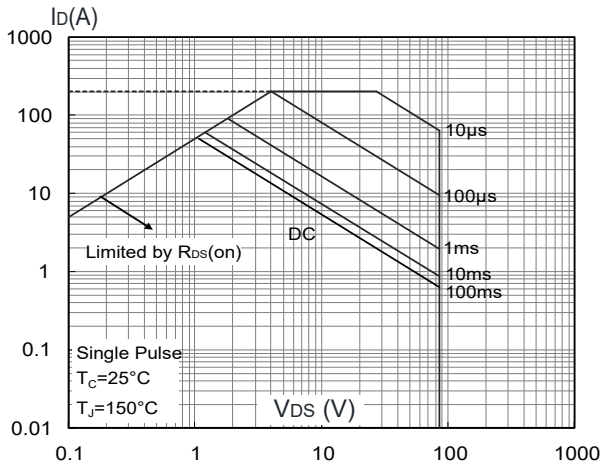
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



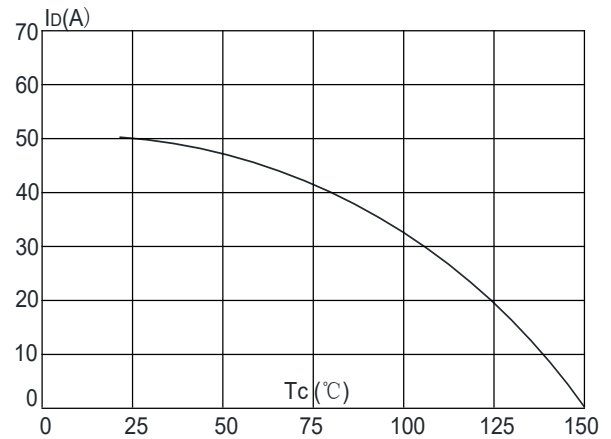
**Figure 8:** Normalized on Resistance vs. Junction Temperature



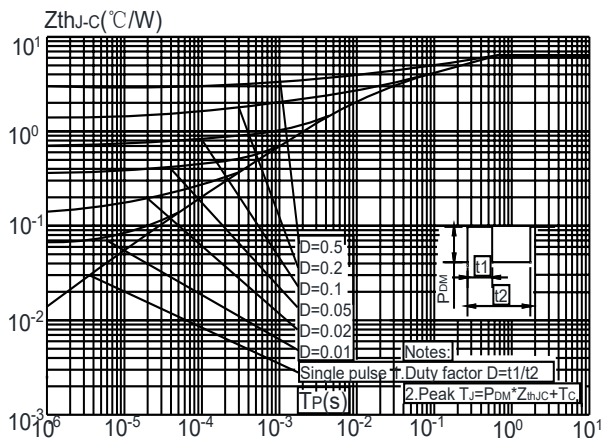
**Figure 9:** Maximum Safe Operating Area

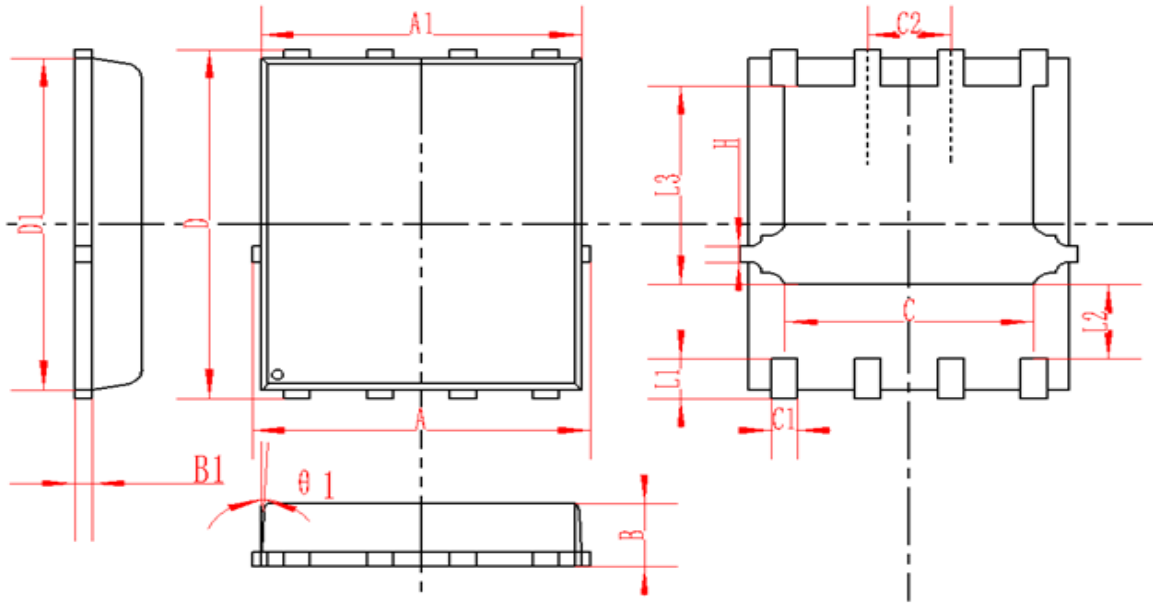


**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature



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



**DFN5X6-8L Package Information**


SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.95	5	5.05	0.195	0.197	0.199
A1	4.82	4.9	4.98	0.190	0.193	0.196
D	5.98	6	6.02	0.235	0.236	0.237
D1	5.67	5.75	5.83	0.223	0.226	0.230
B	0.9	0.95	1	0.035	0.037	0.039
B1	0.254REF			0.010REF		
C	3.95	4	4.05	0.156	0.157	0.159
C1	0.35	0.4	0.45	0.014	0.016	0.018
C2	1.27TYP			0.5TYP		
θ1	8°	10°	12°	8°	10°	12°
L1	0.63	0.64	0.65	0.025	0.025	0.026
L2	1.2	1.3	1.4	0.047	0.051	0.055
L3	3.415	3.42	3.425	0.134	0.135	0.135
H	0.24	0.25	0.26	0.009	0.010	0.010

**REEL SPECIFICATION**

P/N	PKG	QTY
CSD17506Q5A-MS	DFN5X6-8L	5000

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