

**Features**

- Split Gate Trench MOSFET Technology
- Low  $R_{DS(on)}$  & FOM
- Low  $C_{rss}$
- Extremely Low Switching Loss
- Excellent Stability and Uniformity
- Halogen Free. "Green" Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)
- Moisture Sensitivity Level 1

**Maximum Ratings**

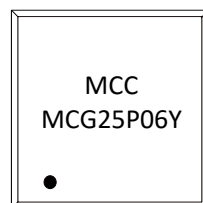
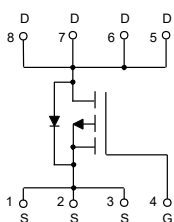
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance:50°C/W Junction to Ambient(Steady-State)<sup>(2)</sup>
- Thermal Resistance:1.7°C/W Junction to Case(Steady-State)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-60	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	$T_C=25^\circ C$	-25
		$T_C=100^\circ C$	-15.8
Pulsed Drain Current <sup>(3)</sup>	$I_{DM}$	-75	A
Total Power Dissipation <sup>(4)</sup>	$P_D$	73.5	W
Single Pulsed Avalanche Energy <sup>(5)</sup>	$E_{AS}$	81	mJ

Note:

1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ C$ . The Power dissipation  $P_{DSM}$  is based on  $R_{\theta JA} t \leq 10s$  and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
3. Repetitive rating; pulse width limited by max. junction temperature.
4.  $P_D$  is based on max. junction temperature, using junction-case thermal resistance.
5.  $V_{DD}=-50V, R_G=25\Omega, L=0.5mH, I_{AS}=-18A$

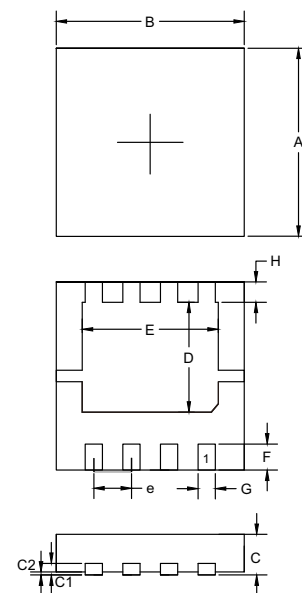
**Internal Structure and Marking Code**



pin1

**P-CHANNEL MOSFET**

**DFN3333**



**DIMENSIONS**

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.70	0.75	17.8	19.0	
B	0.70	0.75	17.8	19.0	
C	0.05	0.08	1.27	2.03	
ØF	0.05	0.09	1.27	2.29	
ØG	0.15	0.20	3.81	5.08	
Ø	0.05	0.10	1.27	2.54	
Ø	0.05	0.10	1.27	2.54	0.10
P	0.016	0.016	0.41	0.41	
^	0.024	0.028	0.61	0.71	

**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-60			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-60V, V_{GS}=0V$			-1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.5	-2.1	-2.7	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-20A$		38	50	m $\Omega$
		$V_{GS}=-4.5V, I_D=-10A$		48	65	
Gate Resistance	$R_g$	F=1 MHz, Open drain		12		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				-25	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-20A$		-0.95	-1.3	V
Reverse Recovery Time	$t_{rr}$	$I_F=-20A, dI_F/dt=100A/\mu s$		28.3		ns
Reverse Recovery Charge	$Q_{rr}$			20.2		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-30V, V_{GS}=0V, f=1MHz$		1024		pF
Output Capacitance	$C_{oss}$			386		
Reverse Transfer Capacitance	$C_{rss}$			22		
Total Gate Charge	$Q_g$	$V_{DS}=-30V, V_{GS}=-10V, I_D=-20A$		17.4		nC
Gate-Source Charge	$Q_{gs}$			3.83		
Gate-Drain Charge	$Q_{gd}$			2.94		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-30V, V_{GS}=-10V, R_{GEN}=6\Omega$		7.9		ns
Turn-On Rise Time	$t_r$			4.63		
Turn-Off Delay Time	$t_{d(off)}$			42.4		
Turn-Off Fall Time	$t_f$			15.7		

**Curve Characteristics**

Fig. 1 - Typical Output Characteristics

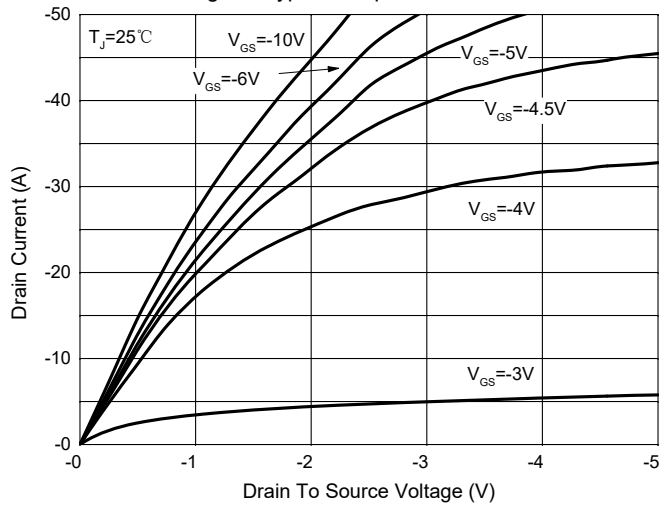


Fig. 2 - Transfer Characteristics

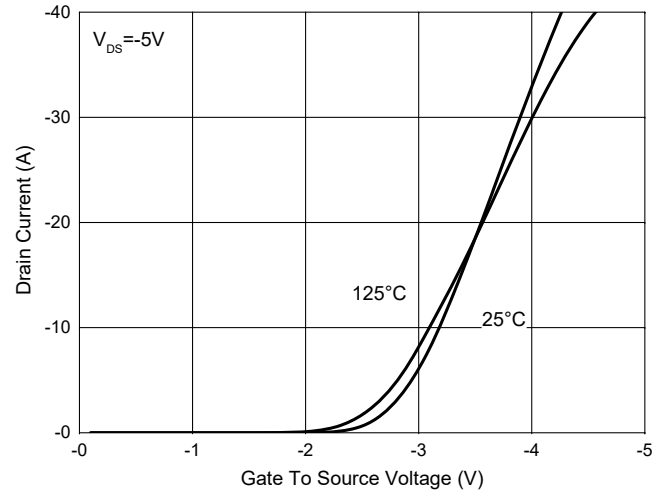


Fig. 3 -  $R_{DS(ON)} - I_D$

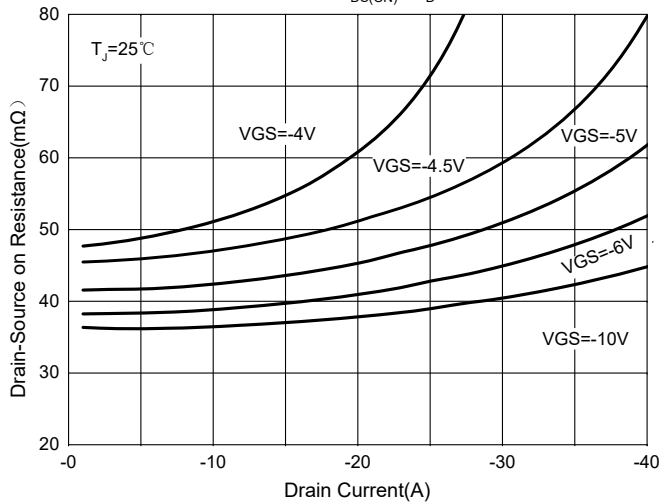


Fig.4-NormalizedOnResistanceCharacteristics

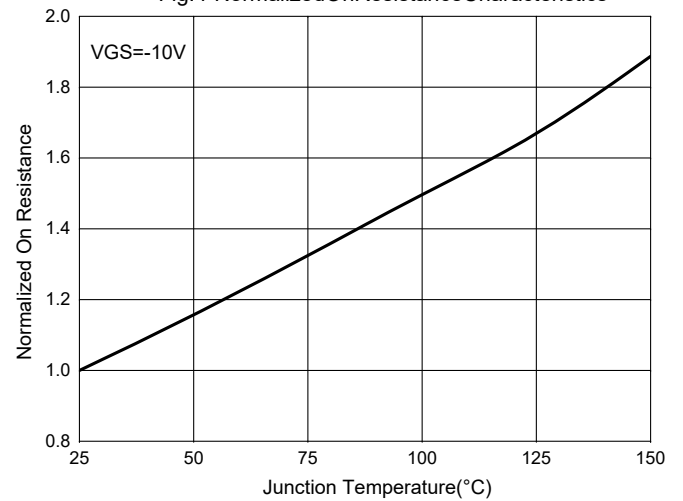


Fig. 5 - Capacitance Characteristics

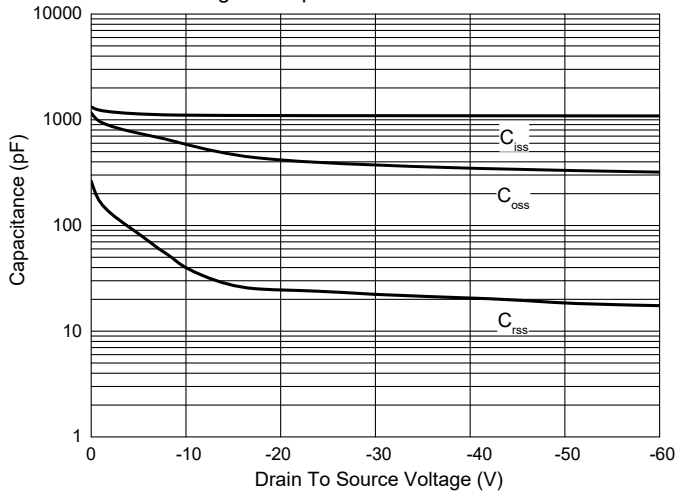
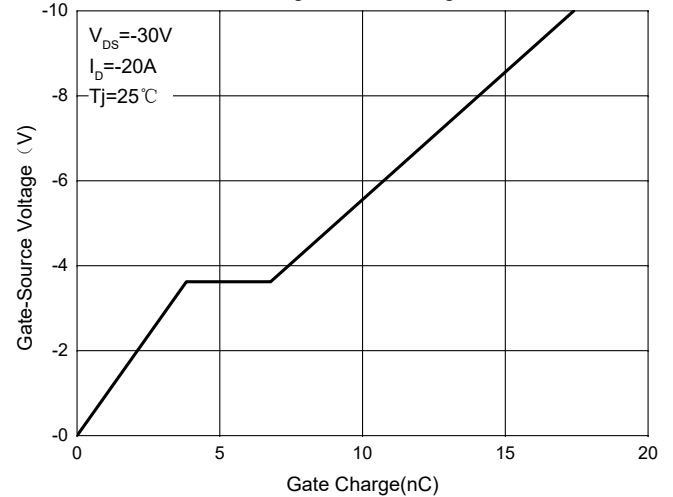


Fig. 6 - GateCharge



**Curve Characteristics**

Fig. 7 -  $R_{DS(ON)} - V_{GS}$

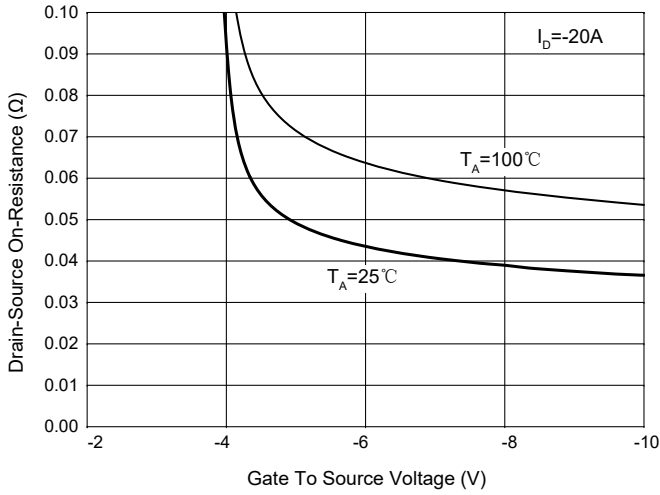


Fig. 8 -  $V_{TH} - T_J$

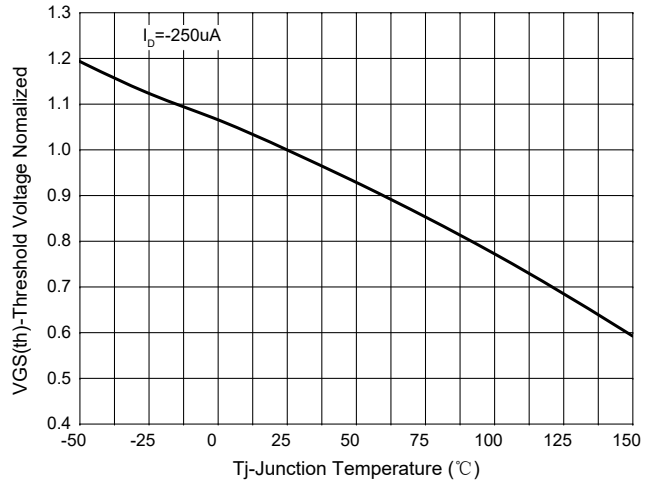


Fig. 9 -  $I_s - V_{SD}$

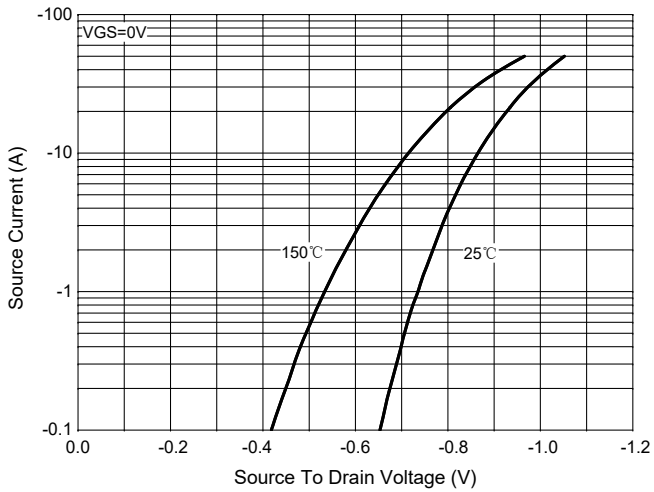


Fig. 10 - Current dissipation

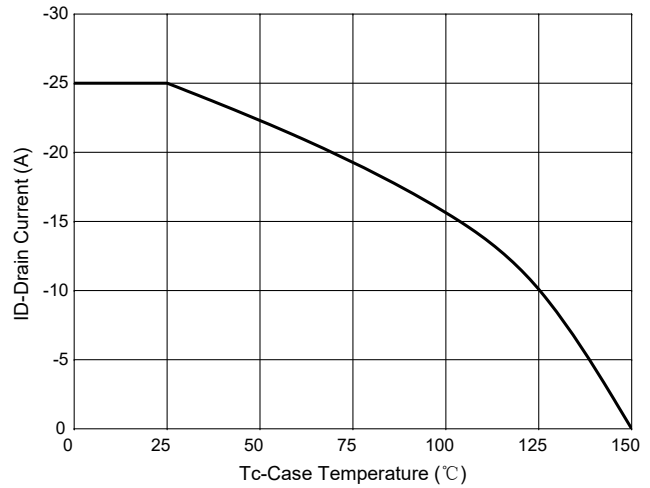
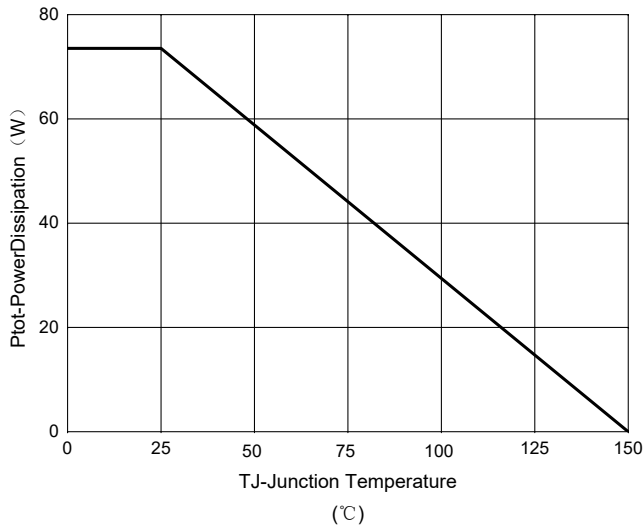


Fig. 11 - Power Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

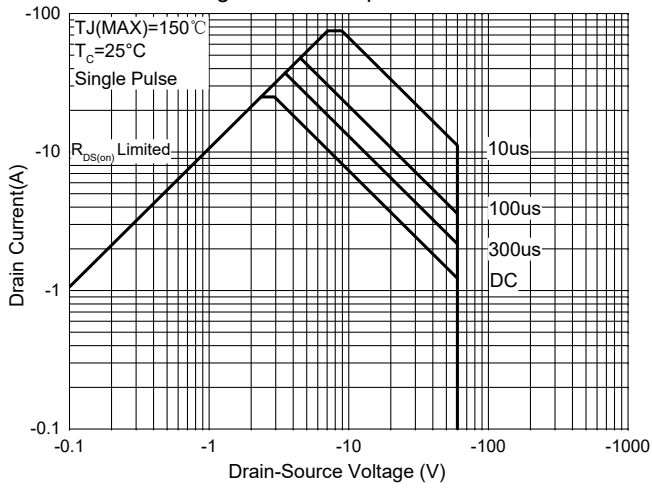
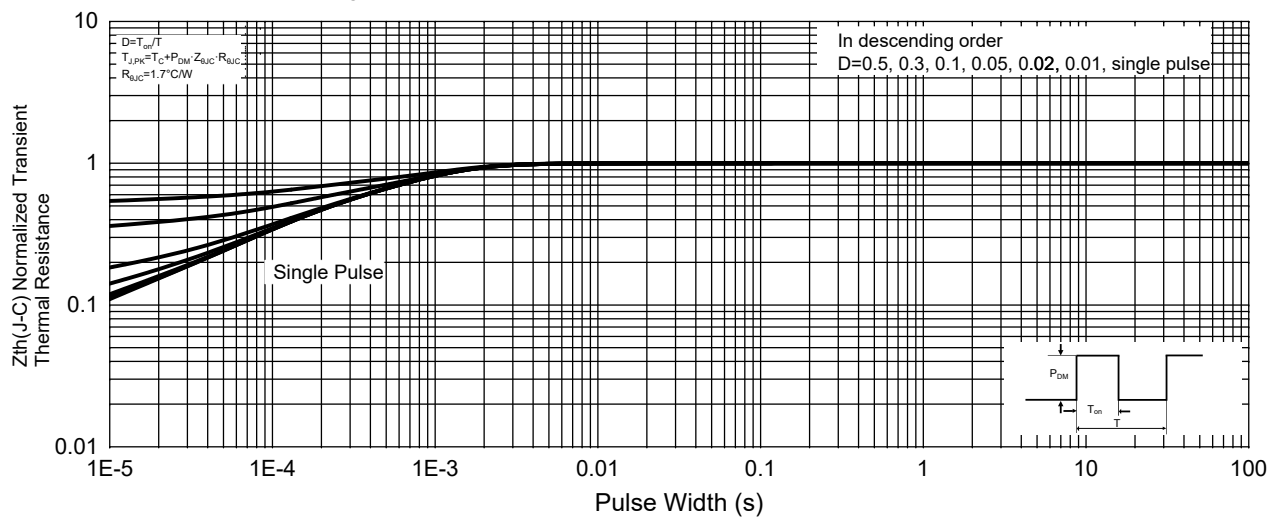


Fig. 13 -Normalized Transient Thermal Impedance



## Ordering Information

Device	Packing
MCG25P06Y-TP	Tape&Reel: 5Kpcs/Reel

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