

RoHS Compliant Product  
A suffix of "-C" specifies halogen & lead-free

## DESCRIPTION

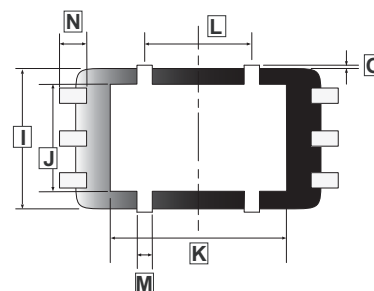
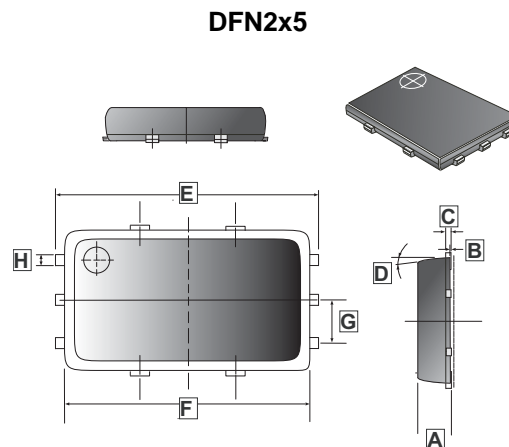
These miniature surface mount MOSFETs utilize a high cell density trench process to provide low  $R_{DS(on)}$  and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones

## FEATURES

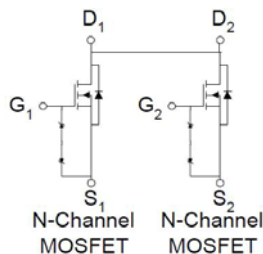
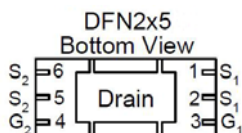
- Low  $R_{DS(on)}$  provides higher efficiency and extends battery life.
- Low thermal impedance copper leadframe DFN2x5 saves board space
- Fast switching speed
- High performance trench technology

## PACKAGE INFORMATION

Package	MPQ	Leader Size
DFN2x5	5K	13' inch



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	0.70	0.80	I	2.00	BSC
B	0.00	0.06	J	1.30	1.55
C	0.10	0.20	K	2.60	2.86
D	0°	12°	L	1.67	BSC
E	5.00	BSC	M	0.15	BSC
F	4.50	BSC	N	0.40	0.60
G	0.50	BSC	O	0.00	0.10
H	0.20	0.30			



## MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current <sup>1</sup>	$I_D$	$T_A = 25^\circ\text{C}$	11
		$T_A = 70^\circ\text{C}$	8.5
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	$\pm 40$	A
Continuous Source Current (Diode Conduction) <sup>1</sup>	$I_S$	3.1	A
Total Power Dissipation <sup>1</sup>	$P_D$	$T_A = 25^\circ\text{C}$	3.5
		$T_A = 70^\circ\text{C}$	1.8
Operating Junction & Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^\circ\text{C}$
<b>Thermal Resistance Ratings</b>			
Maximum Junction-to-Ambient <sup>1</sup>	$t \leq 10$ sec	$R_{\theta JA}$	36
	Steady State		76

Notes

1. Surface Mounted on 1" x 1" FR4 Board.
2. Pulse width limited by maximum junction temperature.

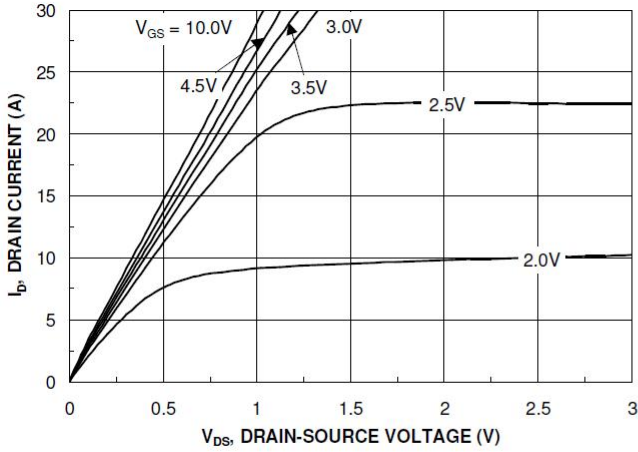
**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Teat Condition
<b>Static</b>						
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	-	V	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$
Gate-Body Leakage Current	$I_{GSS}$	-	-	$\pm 10$	$\mu\text{A}$	$V_{DS}=0$ , $V_{GS}= \pm 12\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS}=16\text{V}$ , $V_{GS}=0$
		-	-	30		$V_{DS}=16\text{V}$ , $V_{GS}=0$ , $T_J=55^\circ\text{C}$
On-State Drain Current <sup>1</sup>	$I_{D(on)}$	20	-	-	A	$V_{DS}=5\text{V}$ , $V_{GS}=4.5\text{V}$
Drain-Source On-Resistance <sup>1</sup>	$R_{DS(ON)}$	10	18	22	m $\Omega$	$V_{GS}=4.5\text{V}$ , $I_D=6.7\text{A}$
		10.5	19	23		$V_{GS}=4\text{V}$ , $I_D=5.6\text{A}$
		11	23	28		$V_{GS}=2.5\text{V}$ , $I_D=4.5\text{A}$
Forward Transconductance <sup>1</sup>	$g_{fs}$	-	22	-	S	$V_{DS}=15\text{V}$ , $I_D=6\text{A}$
Diode Forward Voltage	$V_{SD}$	-	0.7	-	V	$I_S=0.5\text{A}$ , $V_{GS}=0$
<b>Dynamic <sup>2</sup></b>						
Total Gate Charge	$Q_g$	-	9.2	-	nC	$I_D=6\text{A}$ , $V_{DS}=10\text{V}$ , $V_{GS}=4.5\text{V}$
Gate-Source Charge	$Q_{gs}$	-	1.9	-		
Gate-Drain Charge	$Q_{gd}$	-	2.8	-		
Turn-On Delay Time	$T_{d(on)}$	-	1.7	-	nS	$V_{DD}=10\text{V}$ , $V_{GEN}=4.5\text{V}$ $I_D=1\text{A}$ , $R_L=15\Omega$
Rise Time	$T_r$	-	2.3	-		
Turn-Off Delay Time	$T_{d(off)}$	-	1.1	-		
Fall Time	$T_f$	-	4.4	-		

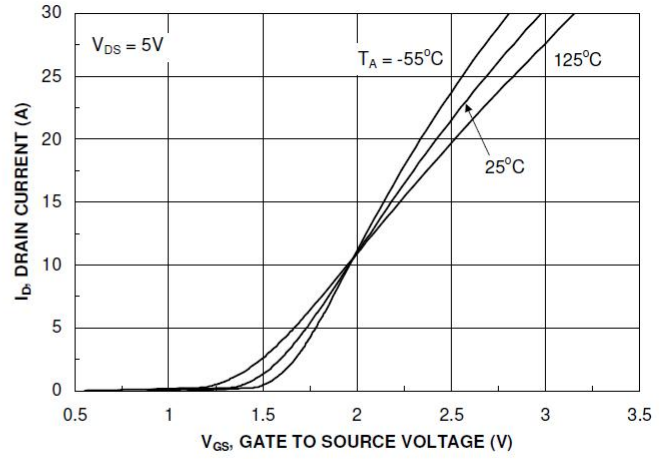
Notes

- Pulse test :  $PW \leq 300\mu\text{s}$  duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.

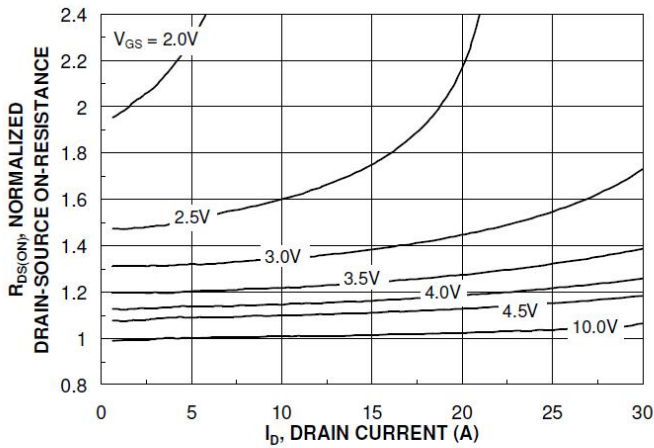
**RATINGS AND CHARACTERISTIC CURVES**



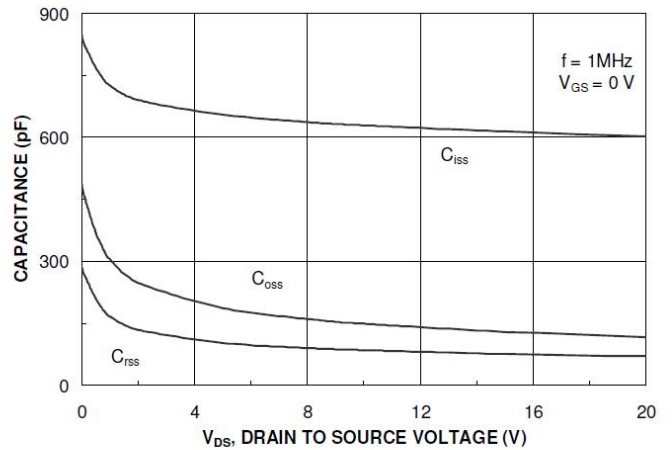
Output Characteristics



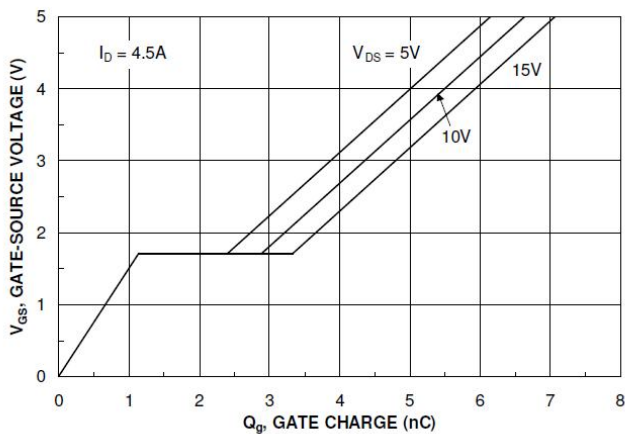
Transfer Characteristics



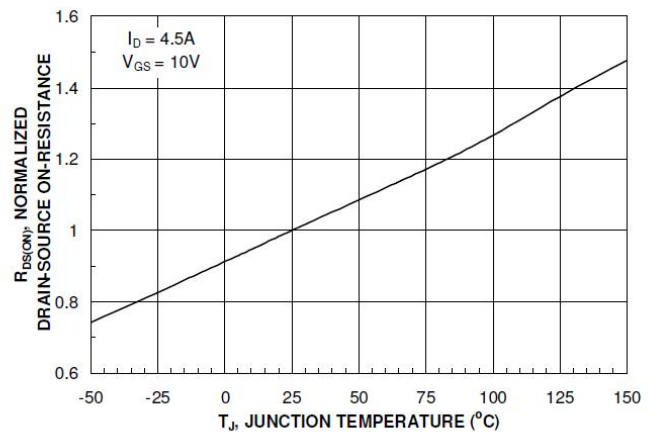
On-Resistance vs. Drain Current



Capacitance

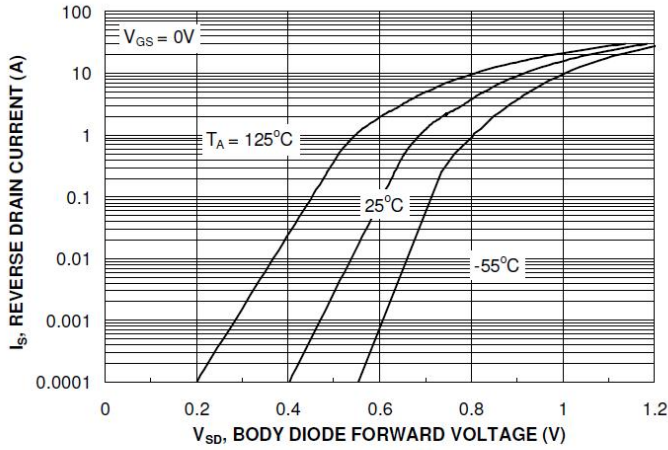


Gate Charge

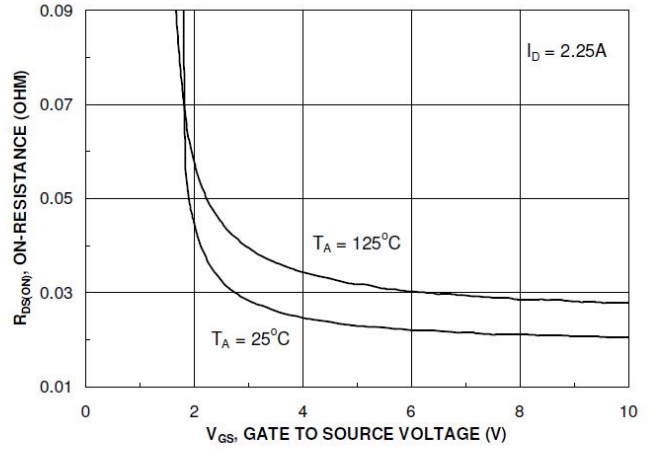


On-Resistance vs. Junction Temperature

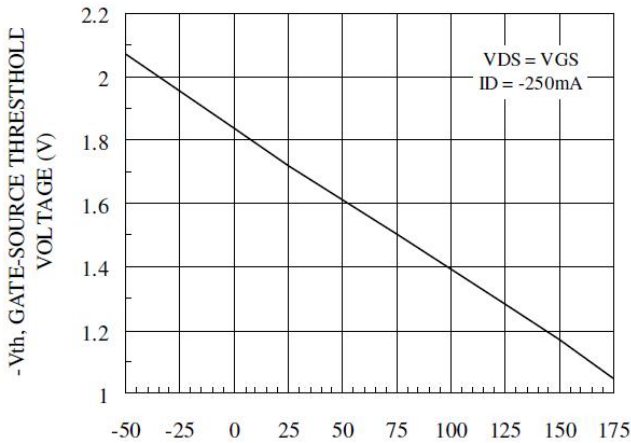
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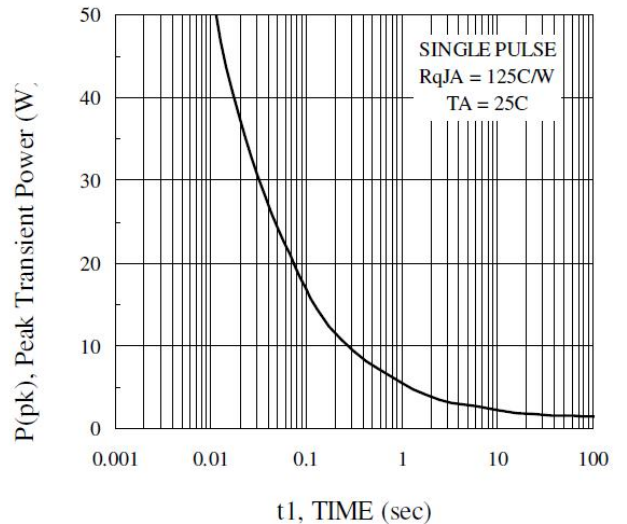
Source-Drain Diode Forward Voltage



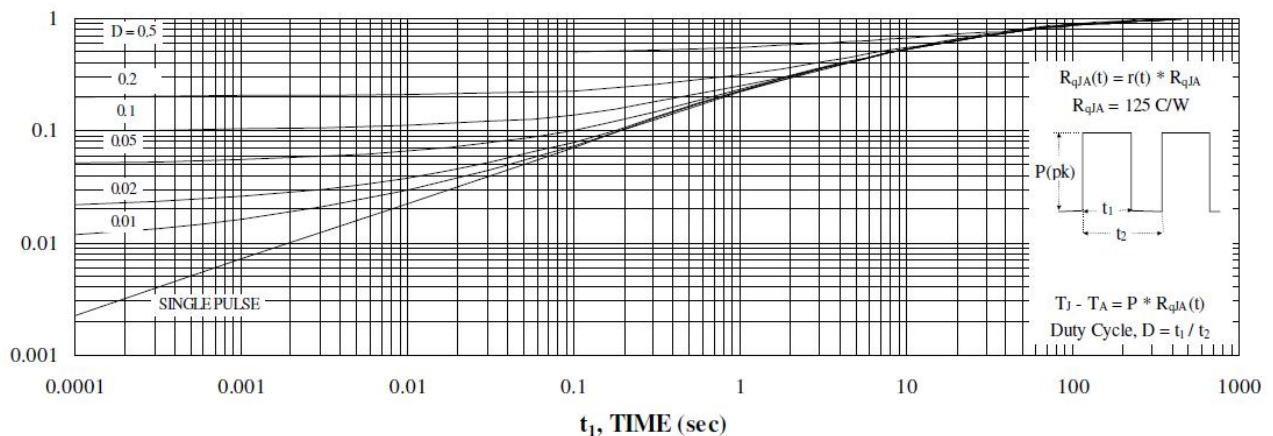
On-Resistance vs. Gate-to-Source Voltage



Vth Gate to Source Voltage Vs Temperature



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Junction to Ambient