

P-Channel 20V(D-S) MOSFET

Product summary		
V_{DS}	-20	V
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$) Typ.	570	m Ω
$R_{DS(ON)}$ (at $V_{GS}=-2.5V$) Typ.	840	m Ω
$I_D(T_A=25^{\circ}C)$	-0.5	A

Features

- Low Threshold Voltage
- ESD protection up to 2 kV
- Small package DFN1006-3L

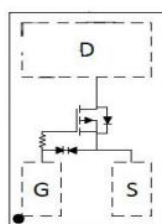
Applications

- Small Signal Switching
- DC-DC converter circuit

Pin Configuration



DFN1006-3L



Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECAD2005T	DFN1006-3L	7"	10000pcs

Absolute Maximum Ratings (at $T_A=25^{\circ}C$ Unless Otherwise Noted)

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		-20	V
V_{GS}	Gate-Source Voltage		± 8	V
I_D	Continuous Drain Current ^A	$T_A=25^{\circ}C$	-0.5	A
		$T_A=70^{\circ}C$	-0.4	A
I_{DM}	Pulse Drain Current Tested ^B		-1.2	A
P_D	Power Dissipation ^A	$T_A=25^{\circ}C$	0.3	W
T_J, T_{STG}	Junction and Storage Temperature Range		-55 to +150	$^{\circ}C$

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JA}$	Thermal Resistance-Junction to ambient ^A	416	$^{\circ}C/W$

Electrical Characteristics (at $T_J = 25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-16V, V_{GS}=0V$	--	--	-1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 8V$	--	--	± 10	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	--	-1.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance ^B	$V_{GS}=-4.5V, I_D=-0.5A$	--	570	750	m Ω
		$V_{GS}=-2.5V, I_D=-0.4A$	--	840	1100	m Ω
		$V_{GS}=-1.8V, I_D=-0.3A$	--	1250	1850	m Ω
V_{SD}	Forward Voltage	$I_{SD}=-0.5A, V_{GS}=0V$	--	--	-1.2	V
Dynamic Parameters ^C						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=-10V$ $f=1\text{MHz}$	--	65	--	pF
C_{oss}	Output Capacitance		--	9.5	--	pF
C_{rss}	Reverse Transfer Capacitance		--	9.8	--	pF
Q_g	Total Gate Charge	$V_{DS}=-10V, I_D=-0.5A$ $V_{GS}=-4.5V$	--	0.85	--	nC
Q_{gs}	Gate-Source Charge		--	0.22	--	nC
Q_{gd}	Gate-Drain Charge		--	0.23	--	nC
$t_{D(on)}$	Turn-on Delay Time	$V_{DS}=-10V$ $I_D=-0.5A,$ $V_{GS}=-4.5V,$ $R_{GEN}=6\Omega$	--	48	--	ns
t_r	Turn-on Rise Time		--	142	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	1420	--	ns
t_f	Turn-off Fall Time		--	2100	--	ns

A. The data tested by surface mounted on a 1 inch x 1 inch FR-4 board with 20Z copper.

B. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

C. Guaranteed by design, not subject to production testing.

Typical Characteristics

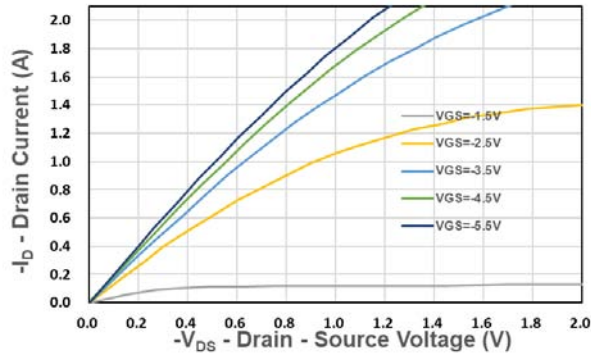


Figure 1. Output Characteristics

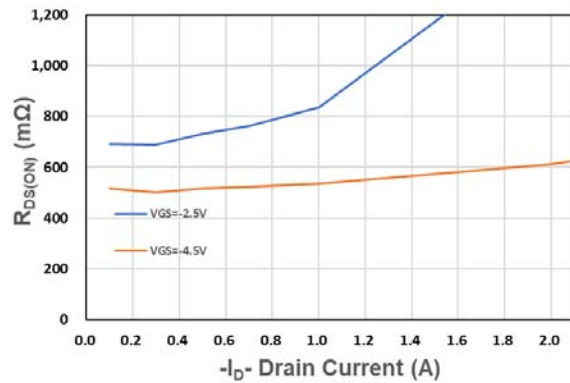


Figure 2. On-Resistance vs. I_D

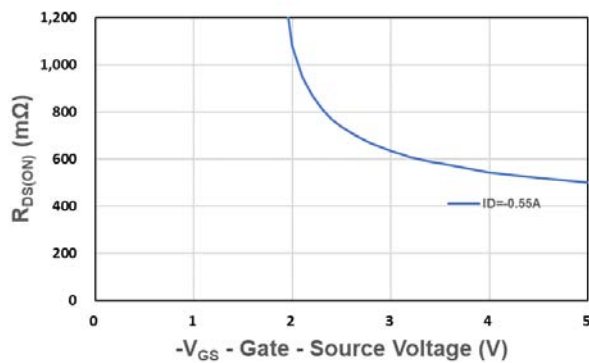


Figure 3. On-Resistance vs. V_{GS}

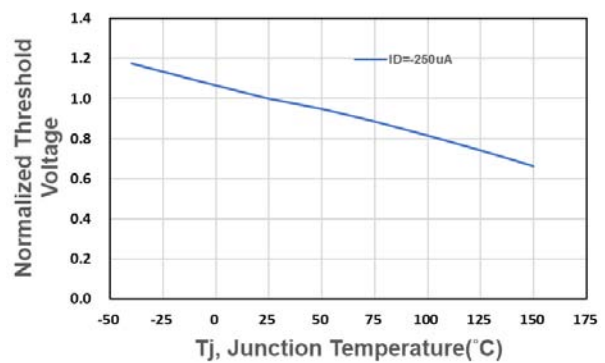


Figure 4. Gate Threshold Voltage

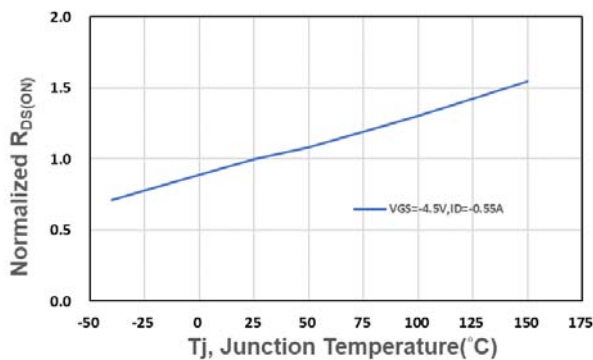


Figure 5. Drain-Source On Resistance

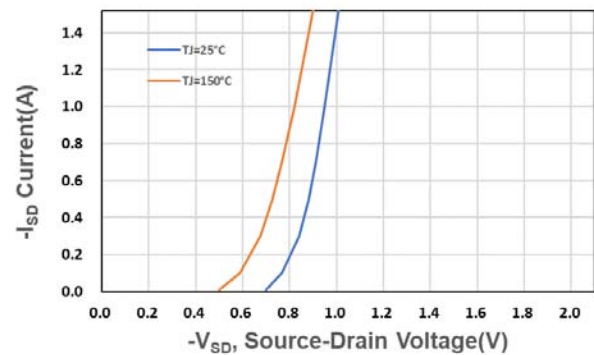


Figure 6. Source-Drain Diode Forward

Typical Characteristics

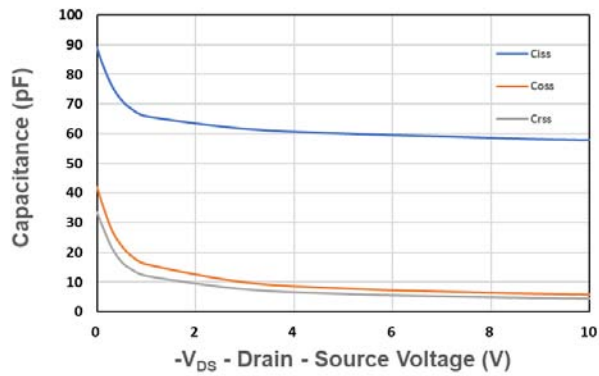


Figure 7. Capacitance

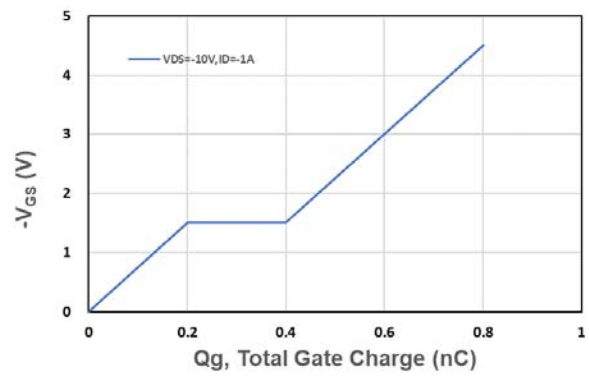


Figure 8. Gate Charge Characteristics

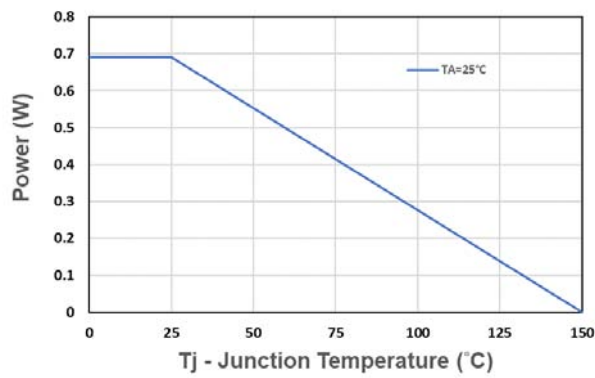


Figure 9. Power Dissipation

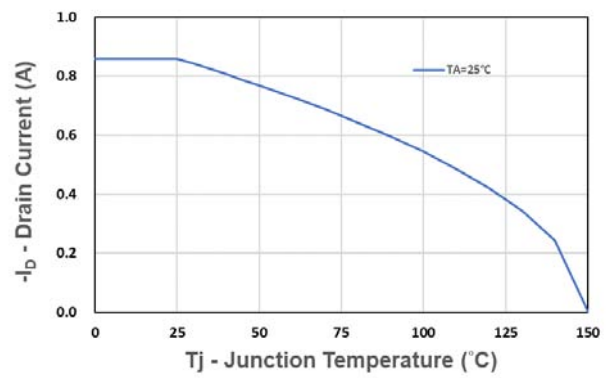


Figure 10. Drain Current

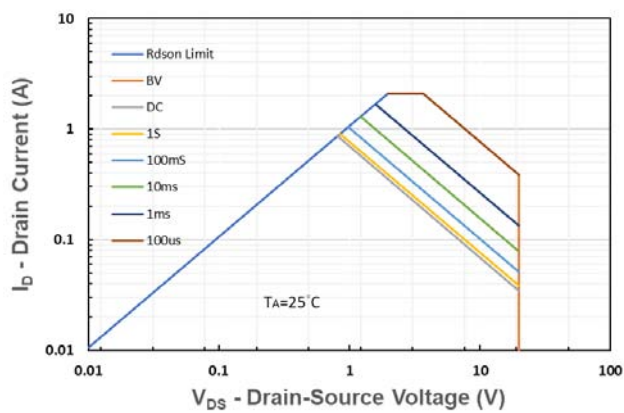


Figure 11. Safe Operating Area

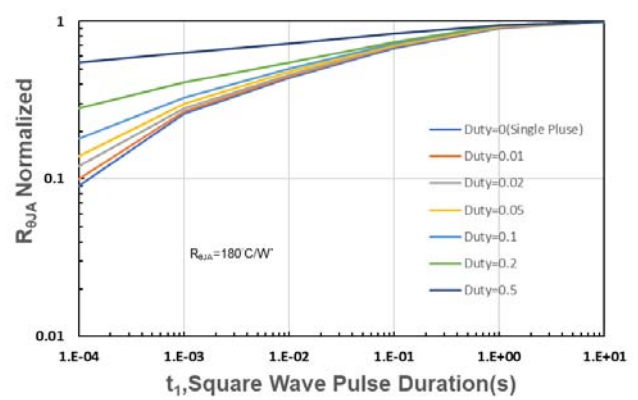
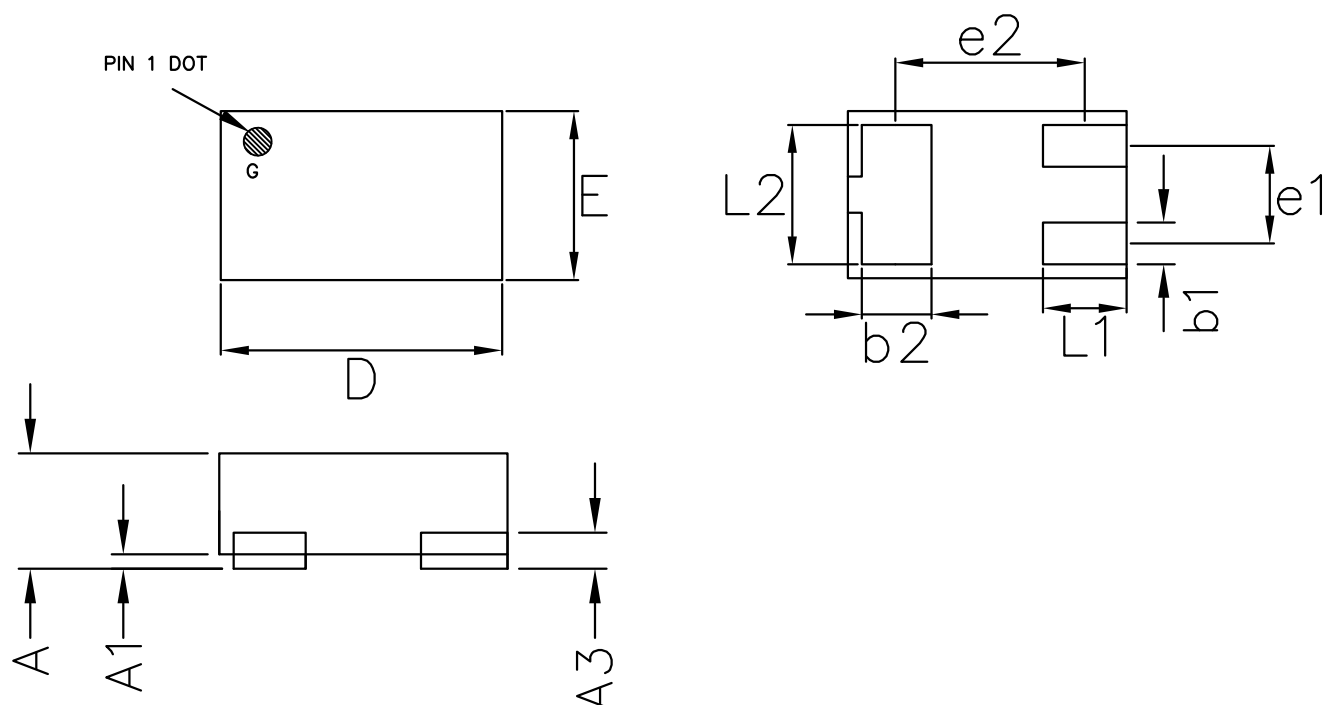


Figure 12. $R_{\theta JA}$ Transient Thermal Impedance

DFN1006-3L Package Information



COMMON DIMENSIONS(MM)			
PKG.	X1: EXTREME THIN		
REF.	MIN.	NOM.	MAX
A	0.30	—	0.40
A1	0.00	—	0.05
A3	0.125 REF.		
D	0.95	1.00	1.05
E	0.55	0.60	0.65
b1	0.10	0.15	0.20
b2	0.20	0.25	0.30
L1	0.20	0.30	0.40
L2	0.40	0.50	0.60
e1	0.35 BSC		
e2	0.675 BSC		