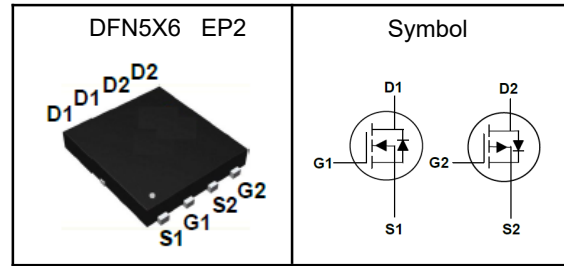


30V N+P-Channel MOSFET
Features

- High Speed Power Switching
- Reliable and Rugged
- ROHS Compliant
- 100% Avalanche Tested

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description


	N-ch	P-ch	
V_{DSS}	30	-30	V
$R_{DS(ON)-Typ}$	18.5	24	m Ω
I_D	24	-19.8	A

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	N-Ch	P-Ch	Unit
V_{DSS}	Drain-Source Voltage	30	-30	V
V_{GSS}	Gate-Source Voltage	± 20	± 20	V
T_J	Maximum Junction Temperature	-55 to 150		$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150		$^\circ\text{C}$
$I_{DM}^{①}$	Pulse Drain Current Tested	70	65	A
I_D	Continuous Drain Current	24	-19.8	A
P_D	Maximum Power Dissipation	18.9	18.9	W
E_{AS}	Avalanche Energy, Single pulse	8.5	18	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	95	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	6.6	$^\circ\text{C/W}$

Note ① : Max. current is limited by bonding wire.

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150°C .

Note ③ : Surface Mounted on 1in^2 FR-4 board with 1oz.



30V N+P-Channel MOSFET

N-ch Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=24V, V_{GS}=0V$	---	---	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	---	2.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=9A$	---	18.5	22	m Ω
		$V_{GS}=4.5V, I_D=8A$	---	25	32	m Ω
Dynamic Characteristics ^⑤						
R_g	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	---	3.3	---	Ω
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, \text{Freq.}=1MHz$	---	395	---	pF
C_{oss}	Output Capacitance		---	105	---	
C_{rss}	Reverse Transfer Capacitance		---	42	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=15V, V_{GS}=10V, I_D=1A, R_G=6\Omega$	---	5.5	---	nS
T_r	Turn-on Rise Time		---	10	---	
$T_{d(off)}$	Turn-off Delay Time		---	15	---	
T_f	Turn-off Fall Time		---	3.8	---	
Q_g	Total Gate Charge	$V_{DS}=15V, V_{GS}=10V, I_D=4A$	---	8.3	---	nC
Q_{gs}	Gate-Source Charge		---	1.1	---	
Q_{gd}	Gate-Drain Charge		---	1.8	---	
Source-Drain Characteristics						
V_{SD}	Diode Forward Voltage	$I_S=1A, V_{GS}=0V$	---	---	1.3	V
t_{rr}	Reverse Recovery Time	$I_F=4A, di/dt=100A/\mu s$	---	11	---	nS
Q_{rr}	Reverse Recovery Charge		---	3.5	---	nC

Note ④: Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

Note ⑤: Guaranteed by design, not subject to production testing.



30V N+P-Channel MOSFET

P-ch Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-24V, V_{GS}=0V$	---	---	-1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.2	---	-2.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=-10V, I_D=-7A$	---	24	30	m Ω
		$V_{GS}=-4.5V, I_D=-4A$	---	34	46	m Ω
Dynamic Characteristics ^⑤						
R_g	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	---	12	---	Ω
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, \text{Freq.}=1\text{MHz}$	---	750	---	pF
C_{oss}	Output Capacitance		---	142	---	
C_{rss}	Reverse Transfer Capacitance		---	100	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=-15V, V_{GS}=-10V, I_D=-1A, R_G=6\Omega$	---	9	---	nS
T_r	Turn-on Rise Time		---	11	---	
$T_{d(off)}$	Turn-off Delay Time		---	55	---	
T_f	Turn-off Fall Time		---	34	---	
Q_g	Total Gate Charge	$V_{DS}=-15V, V_{GS}=-10V, I_D=-7A$	---	17	---	nC
Q_{gs}	Gate-Source Charge		---	2	---	
Q_{gd}	Gate-Drain Charge		---	4	---	
Source-Drain Characteristics						
V_{SD}	Diode Forward Voltage	$I_S=-1A, V_{GS}=0V$	---	---	-1.1	V
t_{rr}	Reverse Recovery Time	$I_F=-7A, di/dt=100A/\mu s$	---	17	---	nS
Q_{rr}	Reverse Recovery Charge		---	9	---	nC

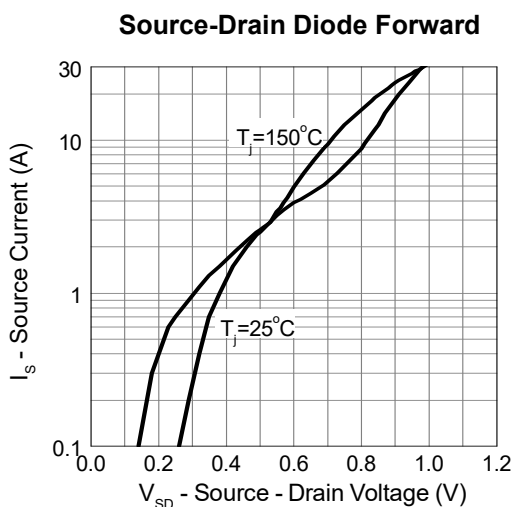
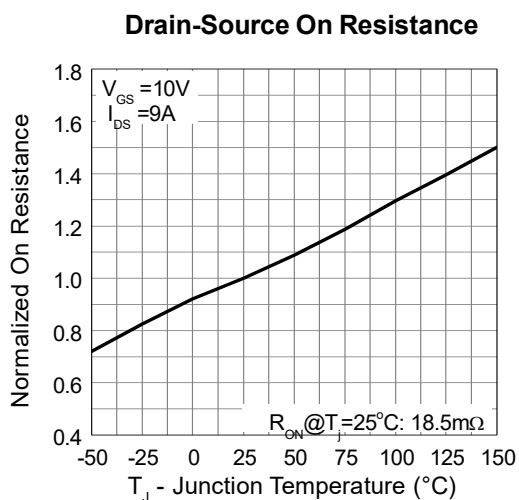
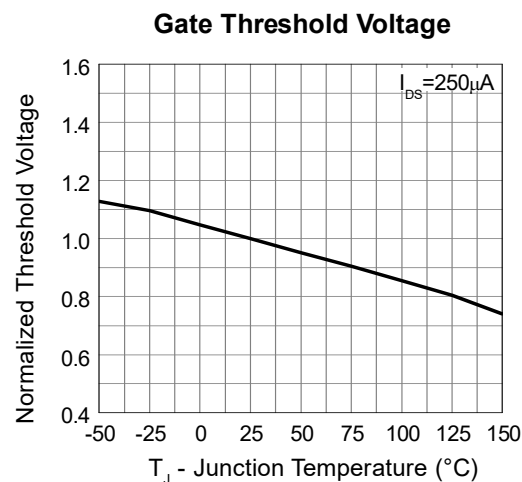
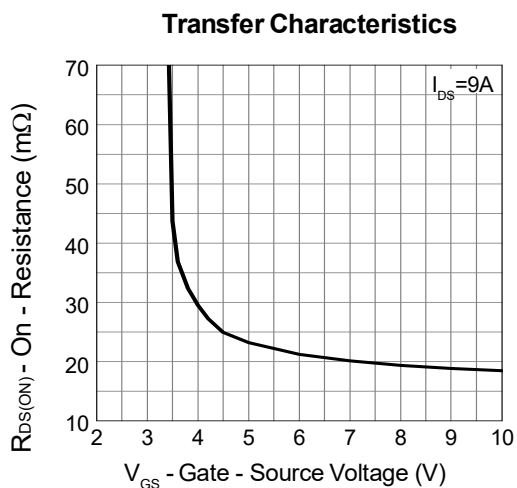
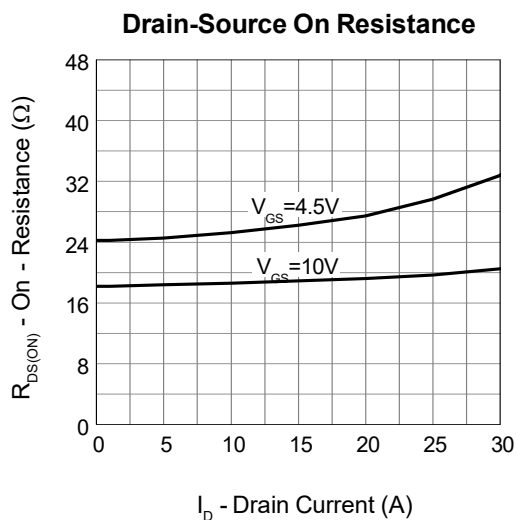
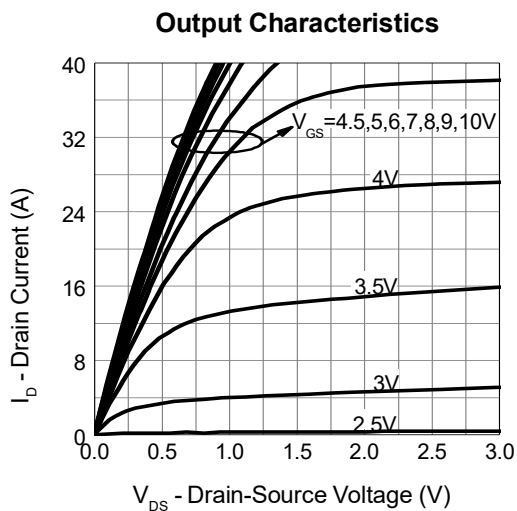
Note ④: Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

Note ⑤: Guaranteed by design, not subject to production testing.



30V N+P-Channel MOSFET

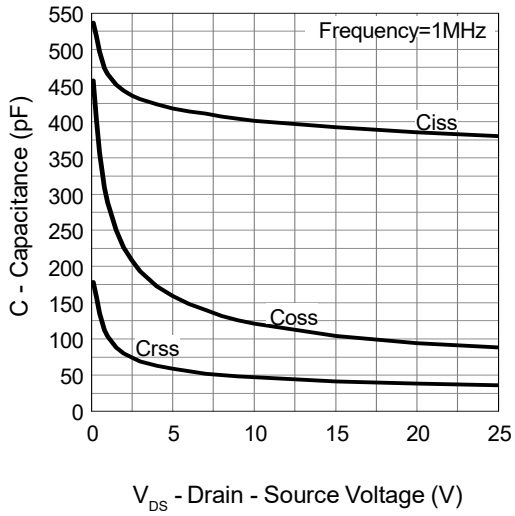
N-ch Typical Characteristics



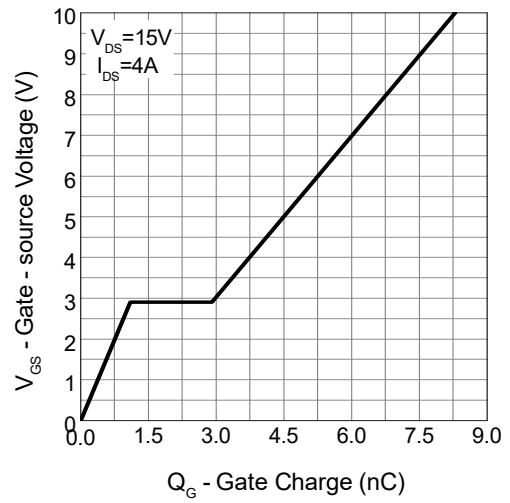


30V N+P-Channel MOSFET

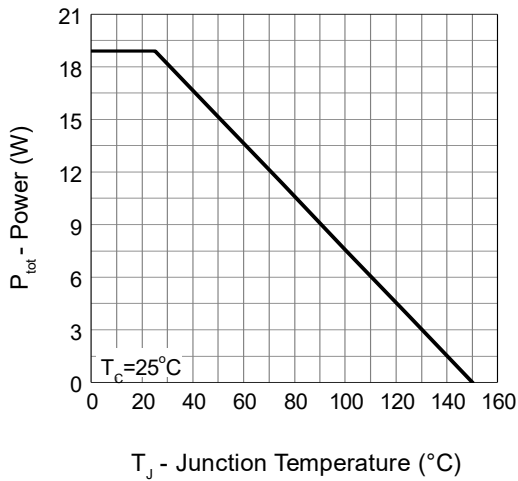
Capacitance



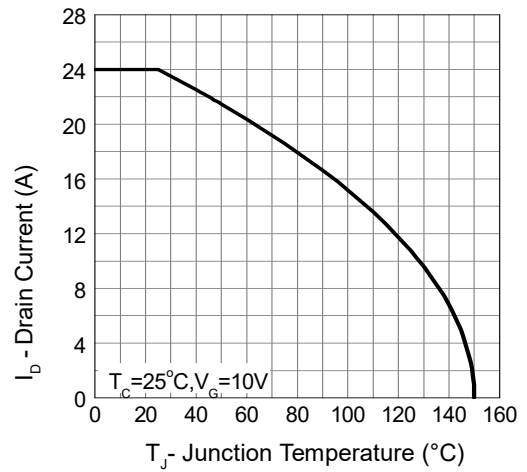
Gate Charge



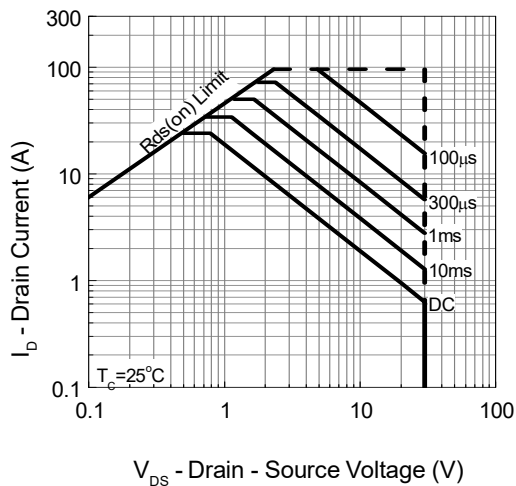
Power Dissipation



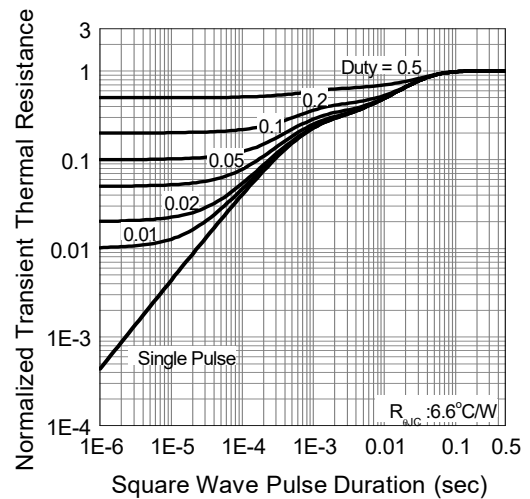
Drain Current



Safe Operation Area



Thermal Transient Impedance

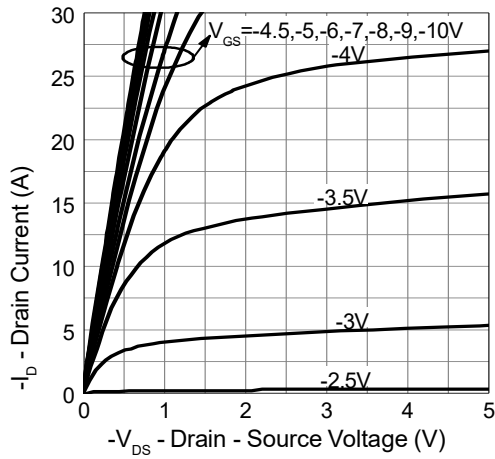




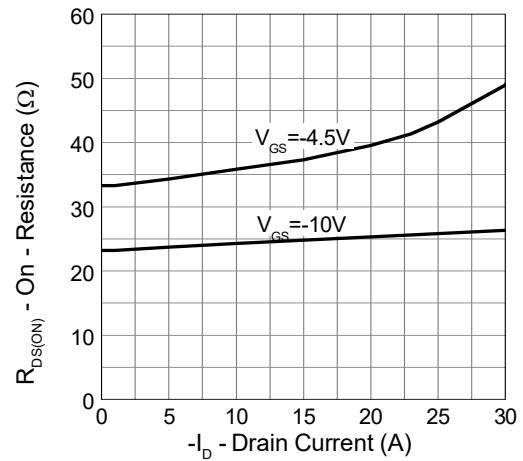
30V N+P-Channel MOSFET

P-ch Typical Characteristics

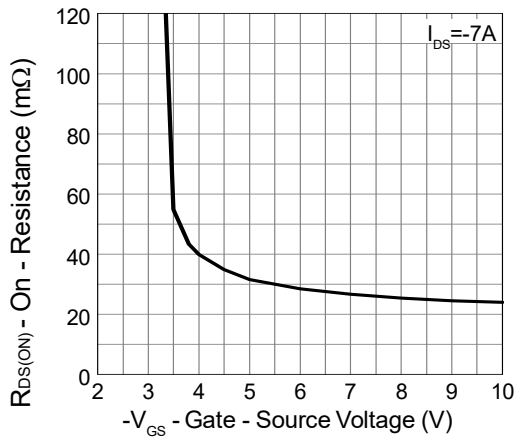
Output Characteristics



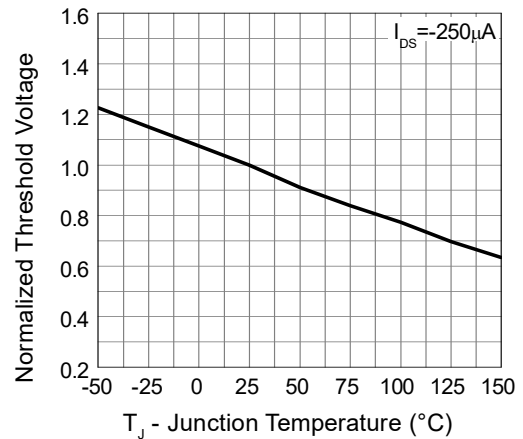
Drain-Source On Resistance



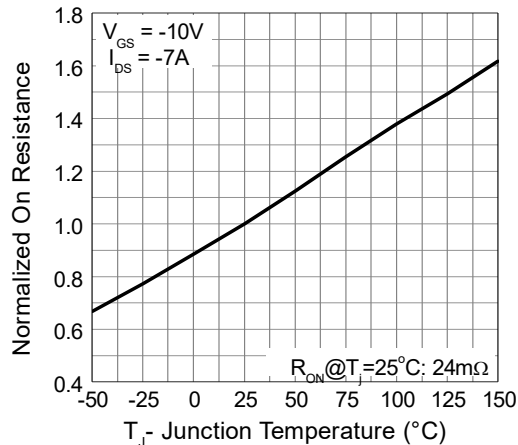
Transfer Characteristics



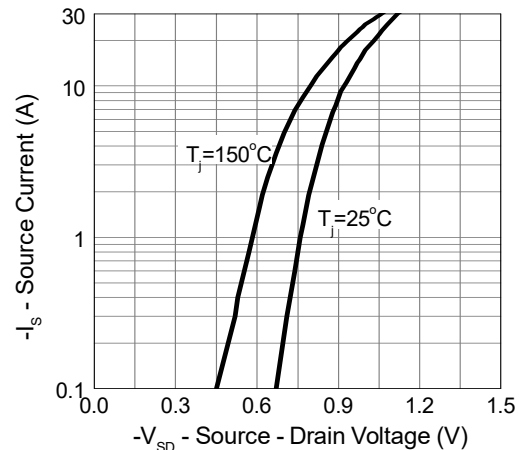
Gate Threshold Voltage



Drain-Source On Resistance



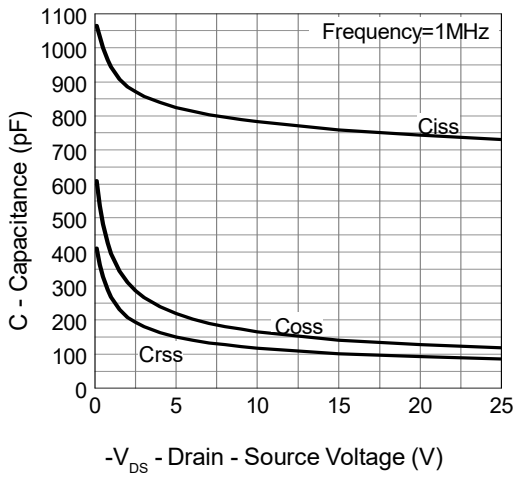
Source-Drain Diode Forward



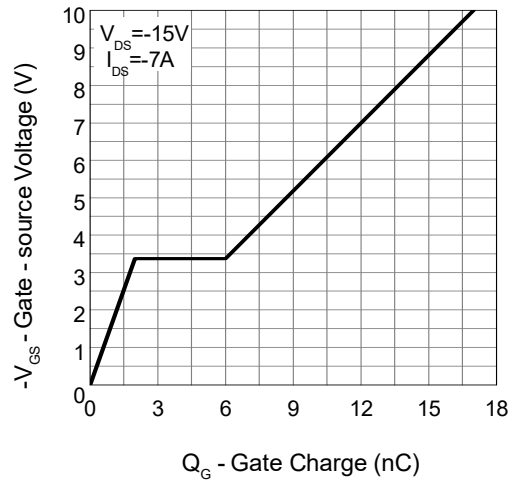


30V N+P-Channel MOSFET

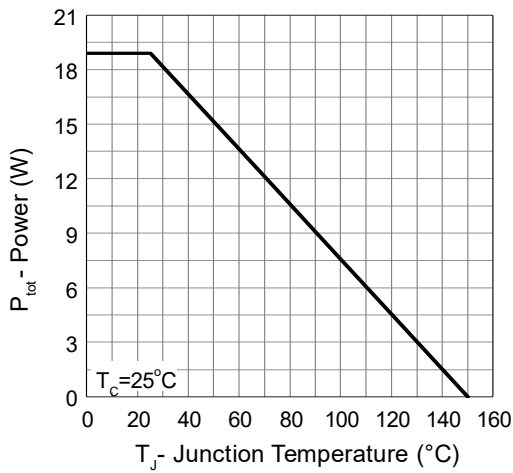
Capacitance



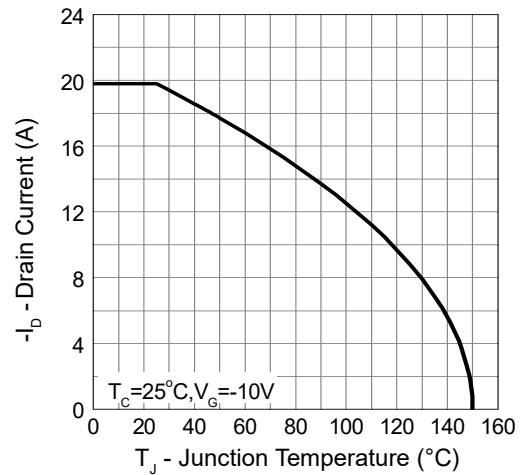
Gate Charge



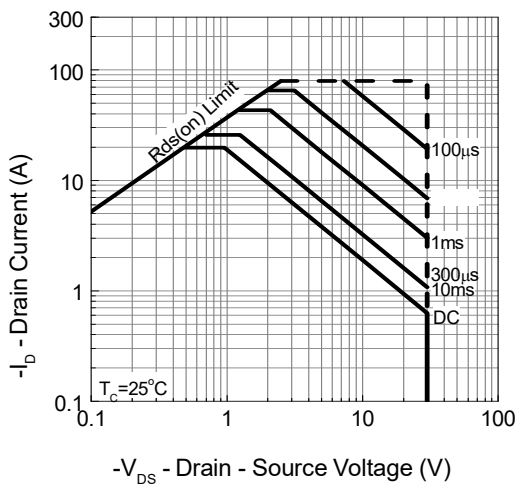
Power Dissipation



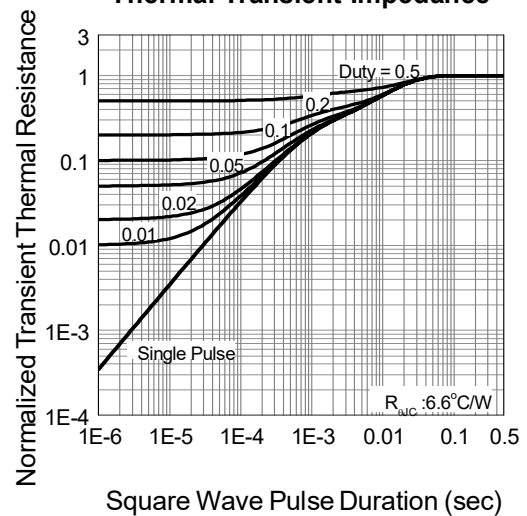
Drain Current

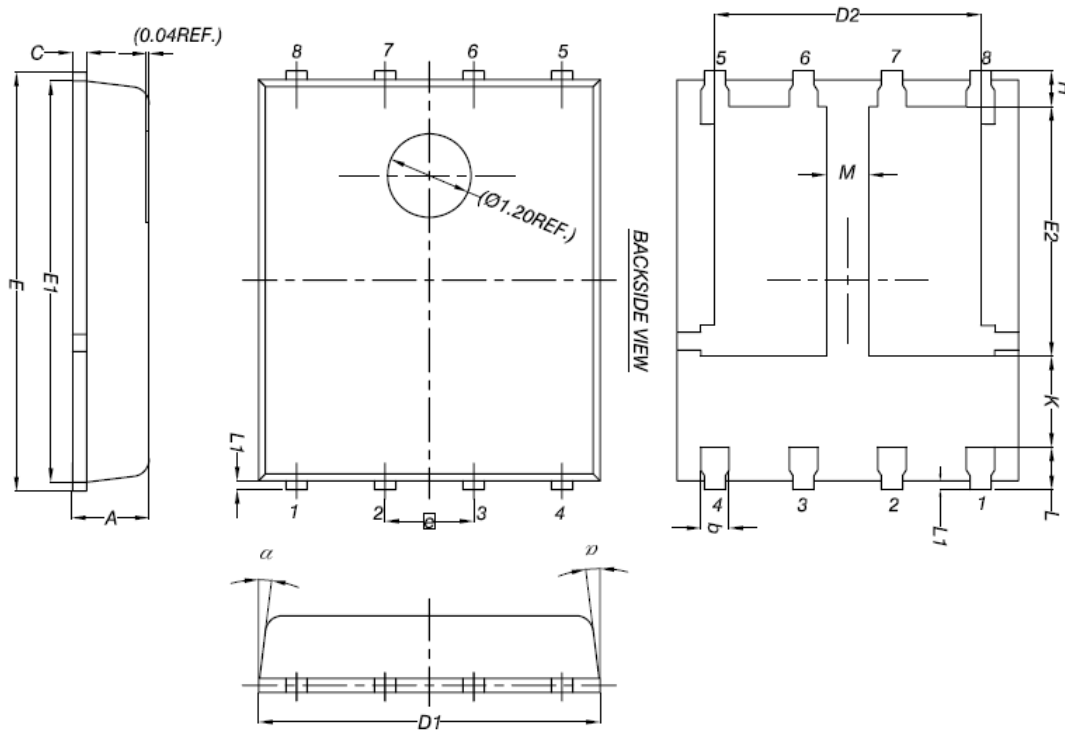


Safe Operation Area



Thermal Transient Impedance



30V N+P-Channel MOSFET
DFN5×6 EP2 Package Outline Data


DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043	e	1.270	BSC	0.050	BSC
b	0.330	0.510	0.013	0.020	H	0.410	0.610	0.016	0.024
C	0.200	0.300	0.008	0.012	K	1.100	-	0.043	-
D1	4.800	5.000	0.189	0.197	L	0.510	0.710	0.020	0.028
D2	3.610	3.960	0.142	0.156	L1	0.060	0.200	0.002	0.008
E	5.900	6.100	0.232	0.240	M	0.500	-	0.020	-
E1	5.700	5.800	0.224	0.228	α	0°	12°	0°	12°
E2	3.380	3.780	0.133	0.149					