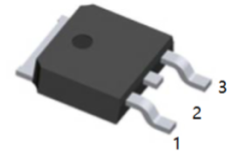
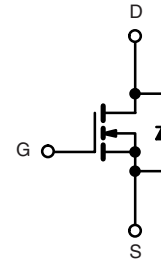


FEATURES

- $V_{DS} (V) = 60V$
- $I_D = 30A (V_{GS}=10V)$
- $R_{DS(ON)} < 25m\Omega (V_{GS} = 10V)$
- $R_{DS(ON)} < 30m\Omega (V_{GS} = 4.5V)$



1.G 2.D 3.S
TO-252(DPAK) top view



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_C = 25\text{ }^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Limit	Unit
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_J = 175\text{ }^\circ\text{C}$) ^b	I_D	$T_C = 25\text{ }^\circ\text{C}$	35
		$T_C = 100\text{ }^\circ\text{C}$	28
Pulsed Drain Current	I_{DM}	100	A
Continuous Source Current (Diode Conduction)	I_S	23	
Avalanche Current	I_{AS}	20	
Single Avalanche Energy (Duty Cycle $\leq 1\%$)	E_{AS}	20	mJ
Maximum Power Dissipation	P_D	$T_C = 25\text{ }^\circ\text{C}$	100
		$T_A = 25\text{ }^\circ\text{C}$	3 ^a
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	R_{thJA}	$t \leq 10\text{ sec}$	18	22
		Steady State	40	50
Maximum Junction-to-Case	R_{thJC}	3.2	4	$^\circ\text{C/W}$

Notes:

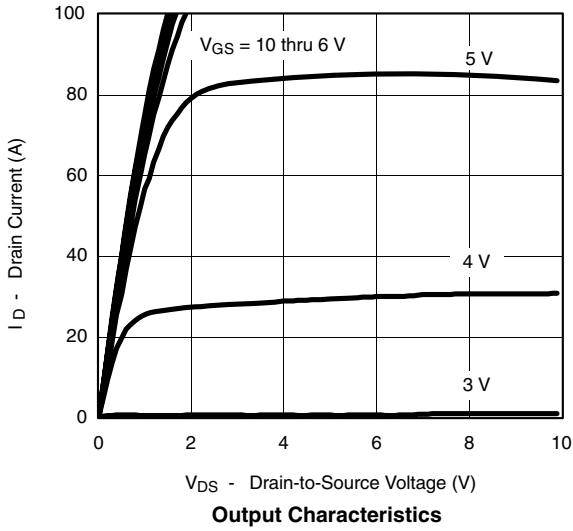
a. Surface Mounted on 1" x 1" FR4 board, $t \leq 10\text{ sec}$.

SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ ^a	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1.0	2.0	3.0	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			50	
		$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}, T_J = 175\text{ }^\circ\text{C}$			250	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	50			A
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 15\text{ A}$		25	31	m Ω
		$V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$		30	45	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 15\text{ A}$		20		S
Dynamic^a						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		670		μF
Output Capacitance	C_{oss}			140		
Reverse Transfer Capacitance	C_{rss}			60		
Total Gate Charge ^c	Q_g	$V_{DS} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 23\text{ A}$		11	17	nC
Gate-Source Charge ^c	Q_{gs}			3		
Gate-Drain Charge ^c	Q_{gd}			3		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 30\text{ V}, R_L = 1.3\text{ }\Omega$ $I_D \cong 23\text{ A}, V_{GEN} = 10\text{ V}, R_g = 2.5\text{ }\Omega$		8	15	ns
Rise Time ^c	t_r			15	25	
Turn-Off Delay Time ^c	$t_{d(off)}$			30	45	
Fall Time ^c	t_f			25	40	
Source-Drain Diode Ratings and Characteristics ($T_C = 25\text{ }^\circ\text{C}$)						
Pulsed Current	I_{SM}				50	A
Diode Forward Voltage	V_{SD}	$I_F = 15\text{ A}, V_{GS} = 0\text{ V}$		1.0	1.5	V
Reverse Recovery Time	t_{rr}	$I_F = 15\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		30	60	ns

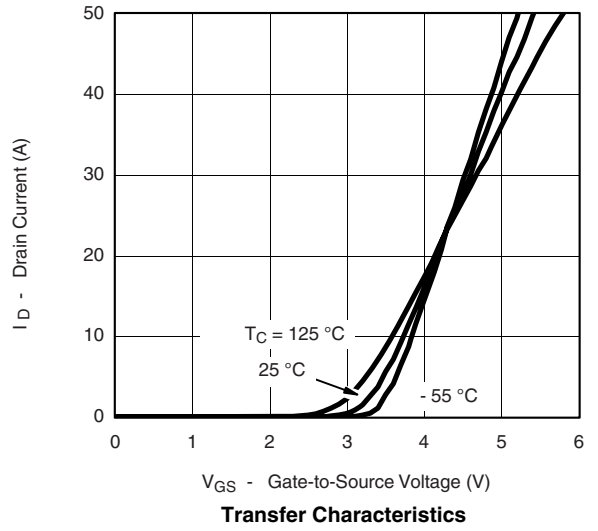
Notes:

- For design aid only; not subject to production testing.
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Independent of operating temperature.

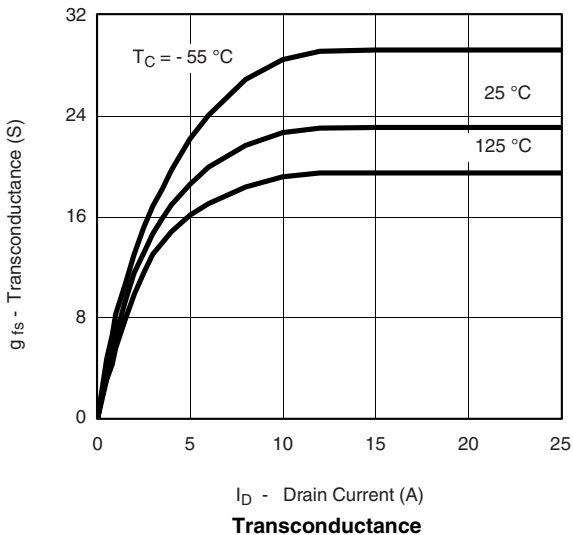
TYPICAL CHARACTERISTICS 25 °C unless noted



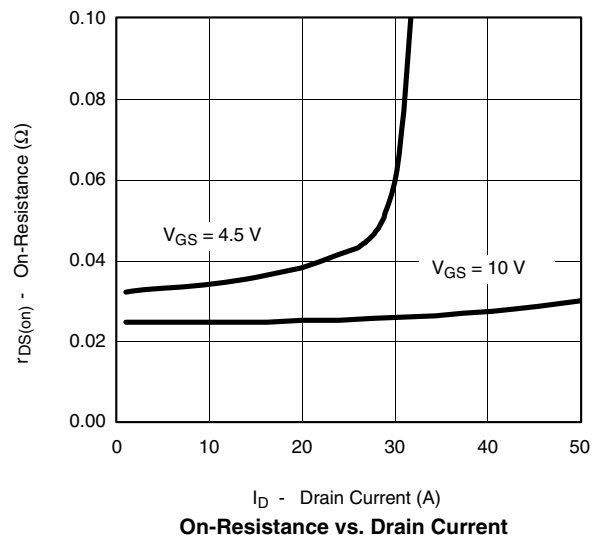
Output Characteristics



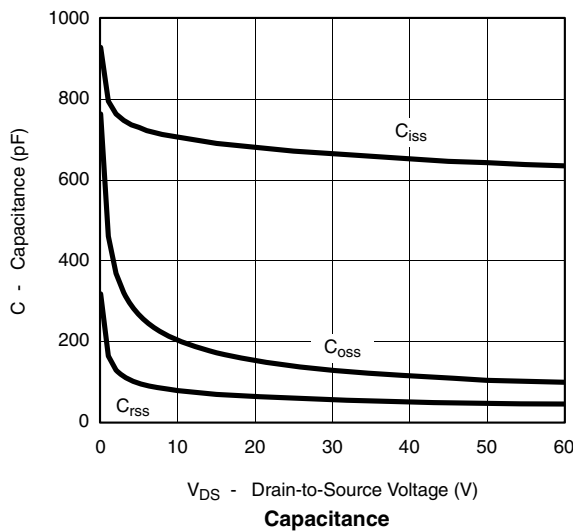
Transfer Characteristics



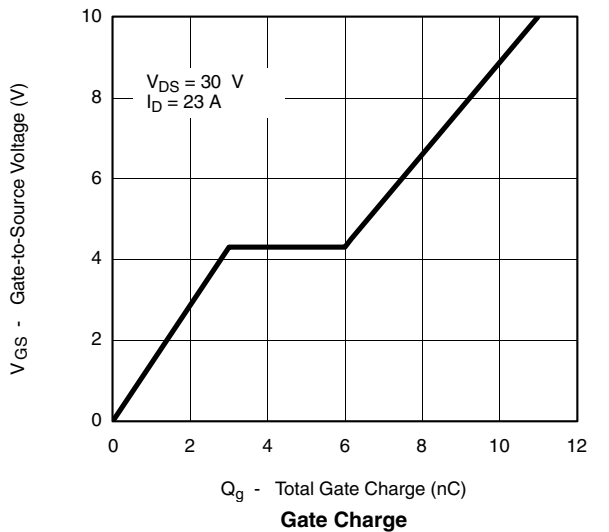
Transconductance



On-Resistance vs. Drain Current

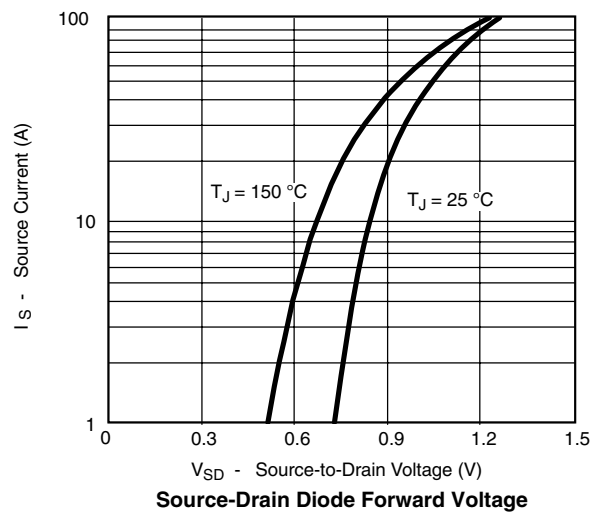
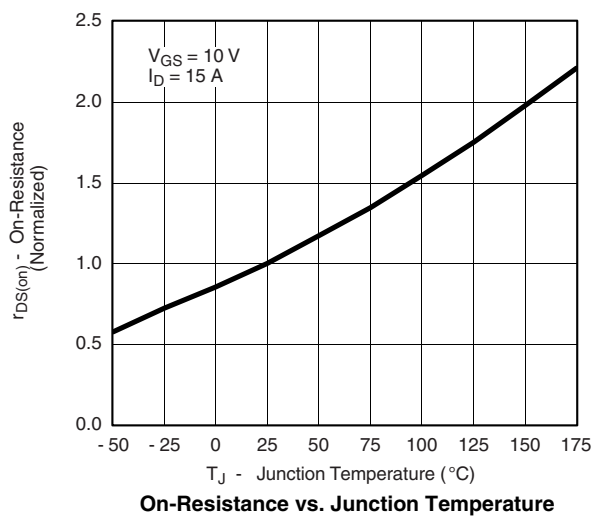


Capacitance

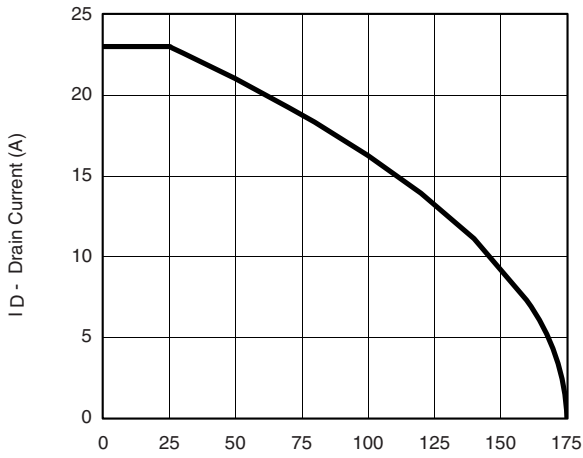


Gate Charge

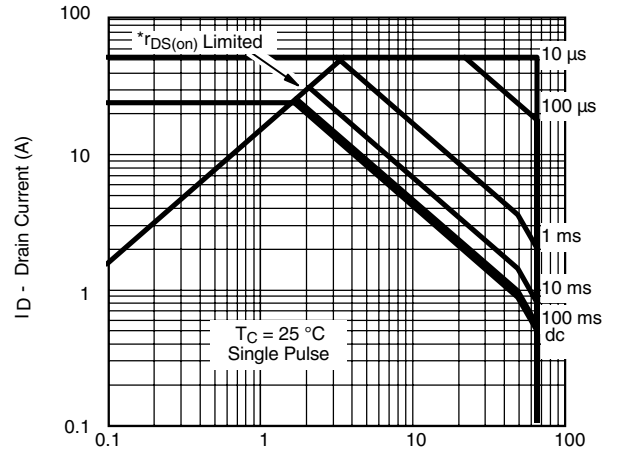
TYPICAL CHARACTERISTICS 25 °C unless noted



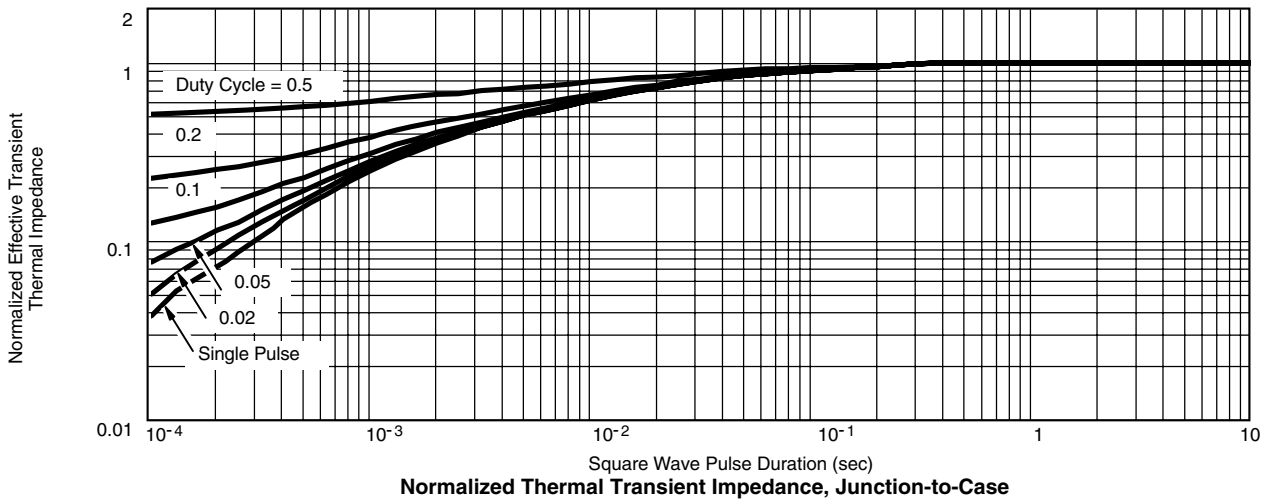
THERMAL RATINGS



T_A - Ambient Temperature (°C)
Maximum Drain Current vs. Ambient Temperature

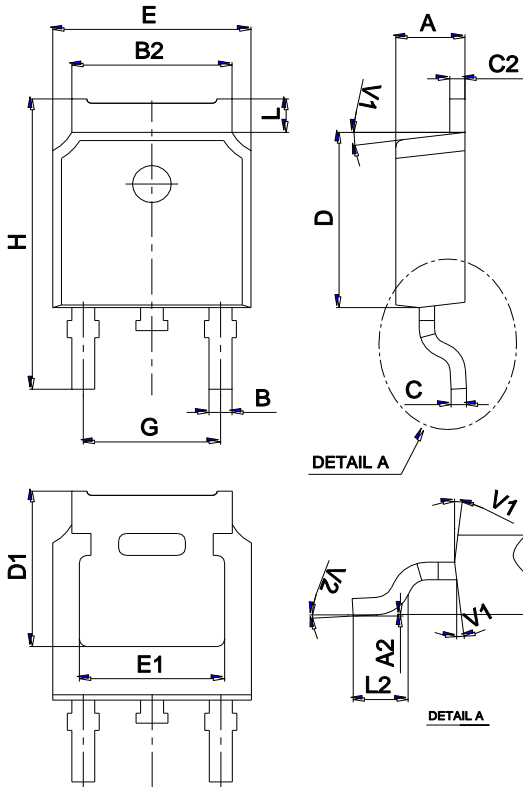


V_{DS} - Drain-to-Source Voltage (V)
 $*V_{GS} >$ minimum V_{GS} at which $r_{DS(on)}$ is specified
Safe Operating Area



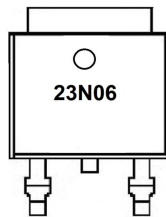
Normalized Thermal Transient Impedance, Junction-to-Case

Package Mechanical Data TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Marking



Ordering information

Order code	Package	Baseqty	Delivery mode
SUD23N06-31	TO-252	2500	Tape and reel