

N-Channel Enhancement-Mode MOSFET, 25-mΩ $r_{DS(on)}$

175°C Maximum Junction Temperature

Product Summary

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
60	0.025	50

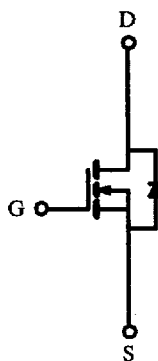
TO-220AB



G D S

Top View

DRAIN connected to TAB



N-Channel MOSFET

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

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V_{DS}	60	V	
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current ($T_J = 175^\circ\text{C}$)	I_D	$T_C = 25^\circ\text{C}$	50	
		$T_C = 100^\circ\text{C}$		35
Pulsed Drain Current	I_{DM}	130	A	
Continuous Source Current (Diode Conduction)	I_S	50		
Avalanche Current	I_{AR}	50		
Avalanche Energy	E_{AS}	$L = 0.1\text{ mH}$	125	mJ
Repetitive Avalanche Energy ^a		$L = 0.05\text{ mH}$	62.5	
Maximum Power Dissipation	P_D	$T_C = 25^\circ\text{C}$	131	W
		$T_C = 100^\circ\text{C}$	65	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 175	°C	
Lead Temperature ($1/16"$ from case for 10 sec.)	T_L	300		

Thermal Resistance Ratings

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient	R_{thJA}		80	°C/W
Maximum Junction-to-Case	R_{thJC}		1.14	
Case-to-Sink	R_{thCS}	1.0		

Notes:

a. Duty cycle $\leq 1\%$

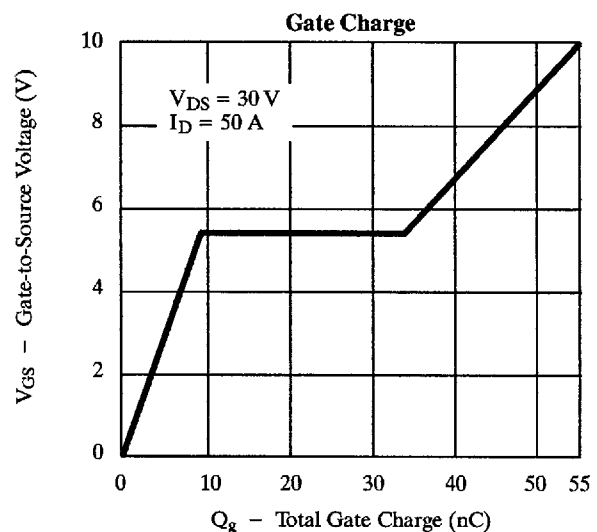
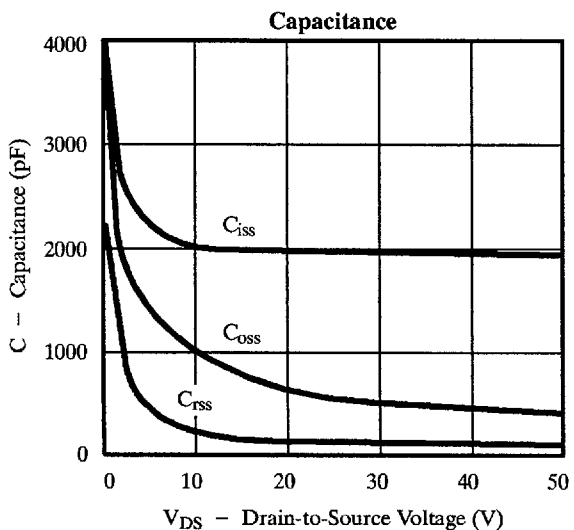
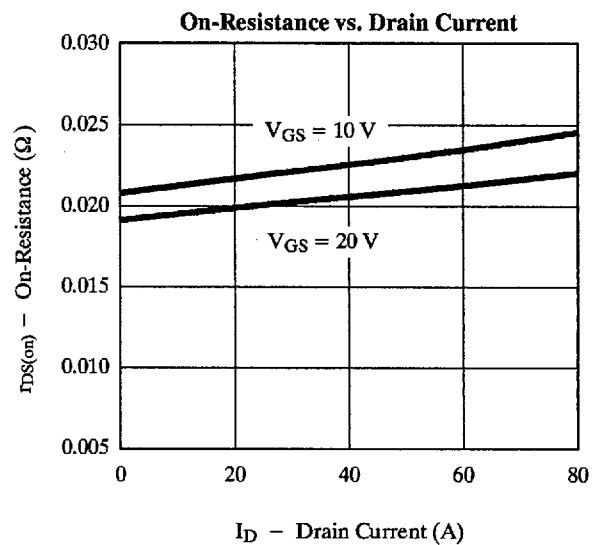
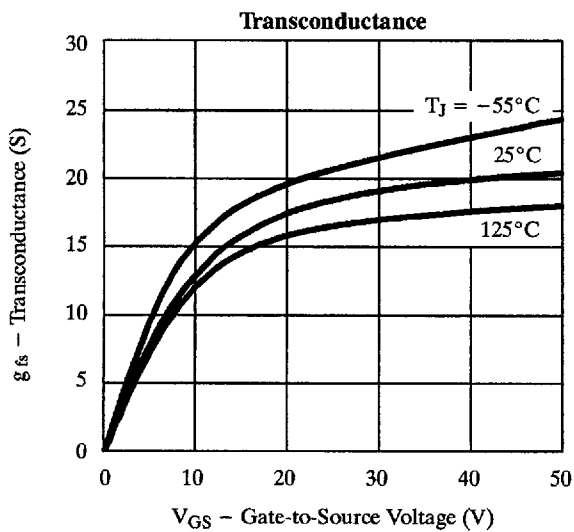
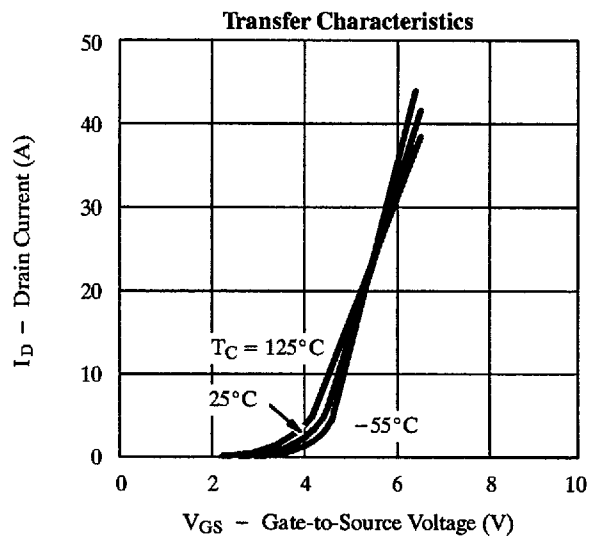
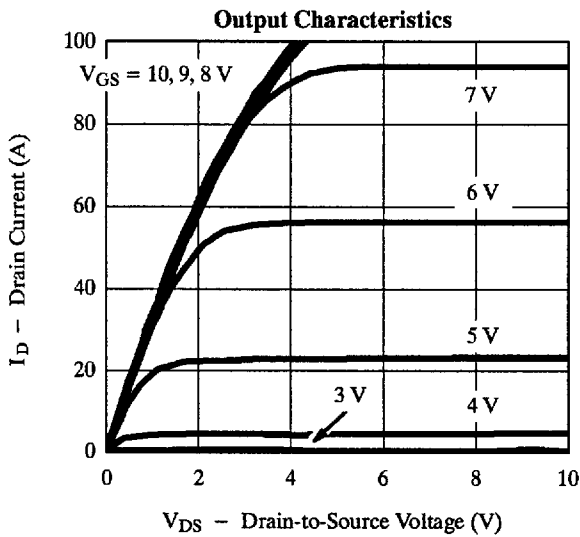
Specifications ($T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ ^a	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 1\ \text{mA}$	2		4	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 20\ \text{V}$			± 500	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 48\ \text{V}, V_{GS} = 0\ \text{V}$			25	μA
		$V_{DS} = 48\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 125^\circ\text{C}$			250	
		$V_{DS} = 48\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 175^\circ\text{C}$			500	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 10\ \text{V}, V_{GS} = 10\ \text{V}$	50			A
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = 10\ \text{V}, I_D = 25\ \text{A}$		0.020	0.025	Ω
		$V_{GS} = 10\ \text{V}, I_D = 25\ \text{A}, T_J = 125^\circ\text{C}$		0.033	0.042	
		$V_{GS} = 10\ \text{V}, I_D = 25\ \text{A}, T_J = 175^\circ\text{C}$		0.043	0.0525	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\ \text{V}, I_D = 25\ \text{A}$		20		S
Dynamic						
Input Capacitance	C_{iss}	$V_{GS} = 0\ \text{V}, V_{DS} = 25\ \text{V}, f = 1\ \text{MHz}$		2000		nC
Output Capacitance	C_{oss}			570		
Reverse Transfer Capacitance	C_{rss}			120		
Total Gate Charge	Q_g	$V_{DS} = 30\ \text{V}, V_{GS} = 10\ \text{V}, I_D = 50\ \text{A}$		55	80	nC
Gate-Source Charge	Q_{gs}			9	15	
Gate-Drain Charge	Q_{gd}			24	40	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 30\ \text{V}, R_L = 0.6\ \Omega$ $I_D \approx 50\ \text{A}, V_{GEN} = 10\ \text{V}, R_G = 2.5\ \Omega$		15	30	ns
Rise Time	t_r			20	35	
Turn-Off Delay Time	$t_{d(off)}$			40	65	
Fall Time	t_f			15	30	
Source-Drain Diode Ratings and Characteristics						
Diode Forward Voltage ^b	V_{SD}	$I_F = 50\ \text{A}, V_{GS} = 0\ \text{V}$			2.0	V
Reverse Recovery Time	t_{rr}	$I_F = 50\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		130		ns
Peak Reverse Recovery Current	$I_{RM(rec)}$			10		A
Reverse Recovery Charge	Q_{rr}			0.7		μC

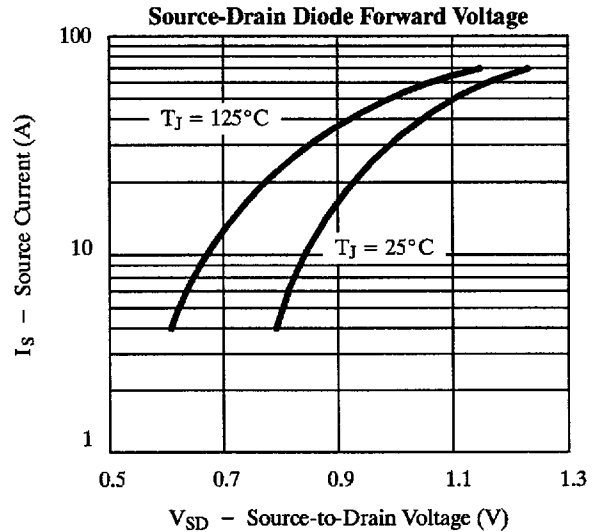
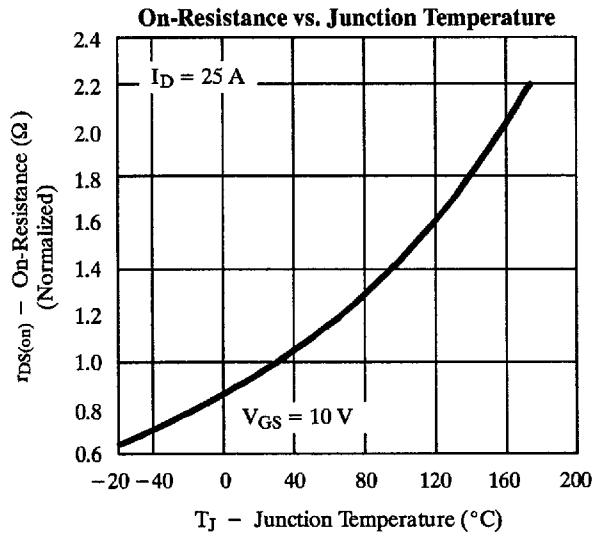
Notes:

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

Typical Characteristics (25°C Unless Otherwise Noted)



Typical Characteristics (25°C Unless Otherwise Noted)



Thermal Ratings

