

N-Channel 75-V (D-S) MOSFET with Sense Terminal

PRODUCT SUMMARY

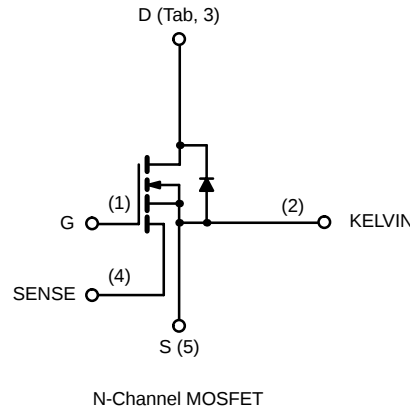
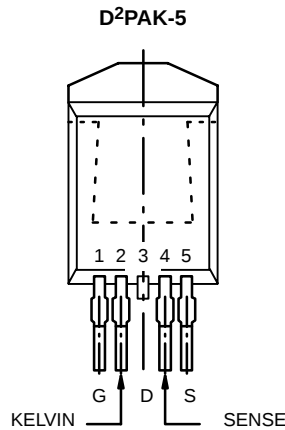
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
75	0.007 @ $V_{GS} = 10$ V	60 ^a

FEATURES

- TrenchFET® Power MOSFET Plus Current Sense
- New Low Thermal Resistance Package

APPLICATIONS

- Automotive
- Industrial



ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	75	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 175^\circ\text{C}$) ^d	$T_C = 25^\circ\text{C}$	I_D	60 ^a	A
	$T_C = 100^\circ\text{C}$		60 ^a	
Pulsed Drain Current		I_{DM}	240	
Continuous Diode Current (Diode Conduction) ^d		I_S	60 ^a	
Avalanche Current		I_{AR}	60 ^a	
Repetitive Avalanche Energy ^b	$L = 0.1$ mH	E_{AR}	180	mJ
	$T_C = 25^\circ\text{C}$		300 ^c	
Maximum Power Dissipation ^a	$T_A = 25^\circ\text{C}$	P_D	3.75 ^d	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Limit	Unit
Junction-to-Ambient ^d	PCB Mount ^d	R_{thJA}	40	$^\circ\text{C/W}$
Junction-to-Case		R_{thJC}	0.5	

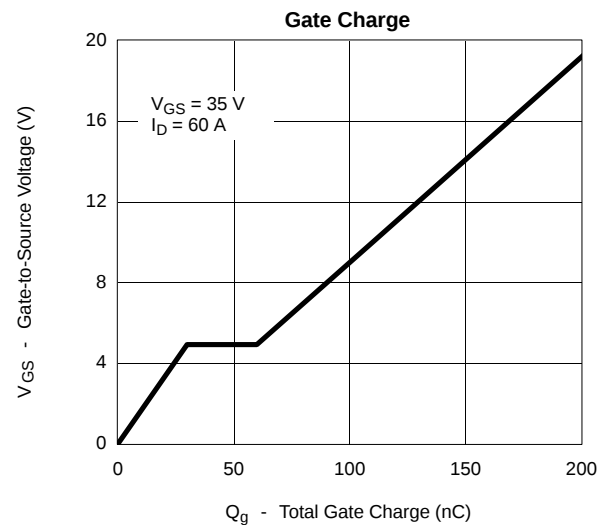
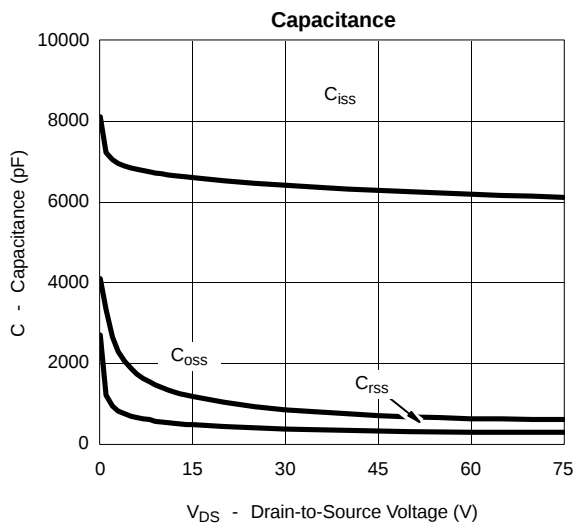
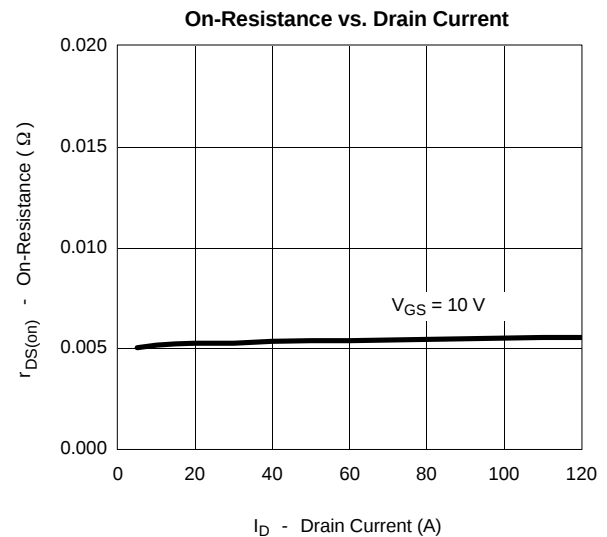
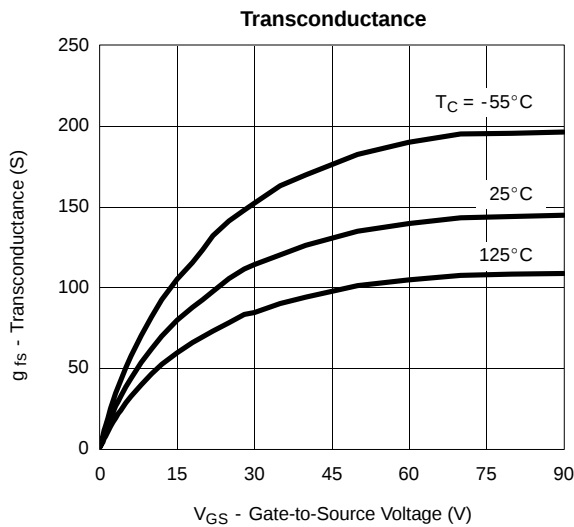
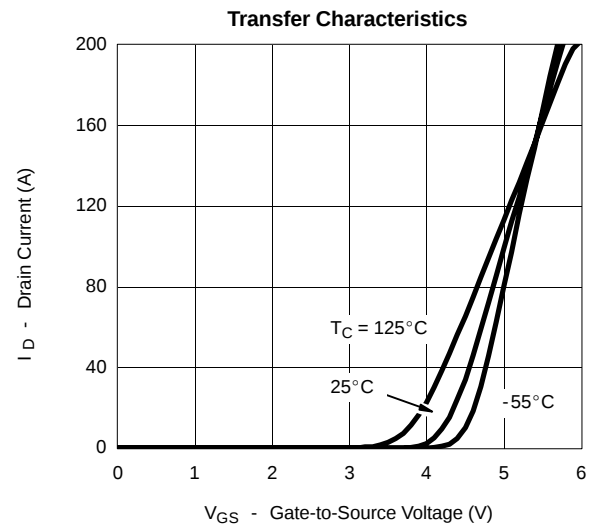
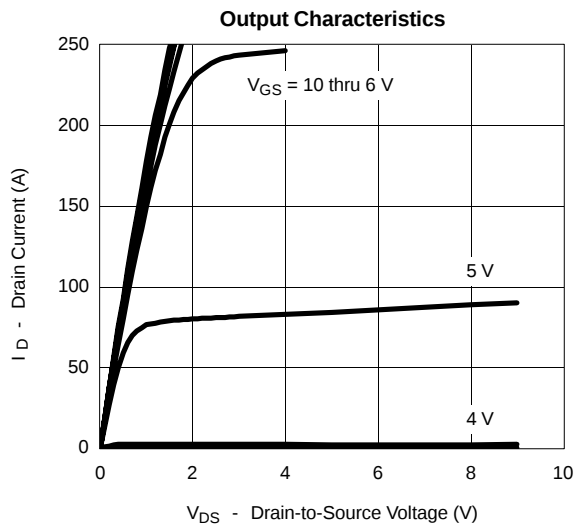
Notes

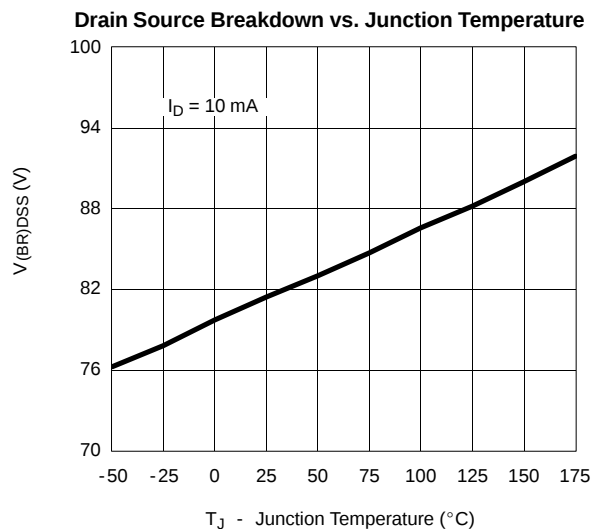
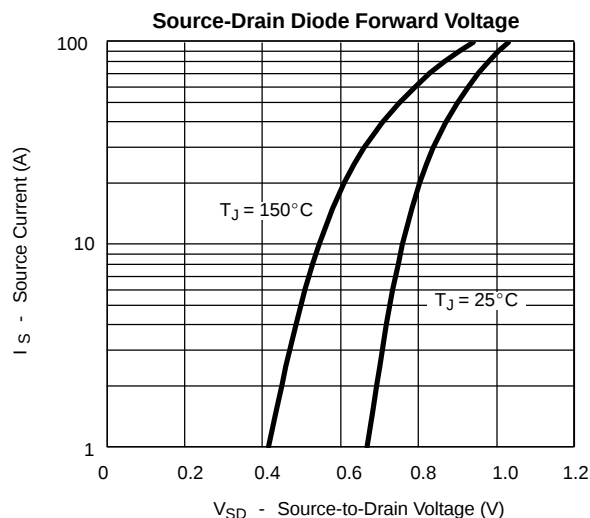
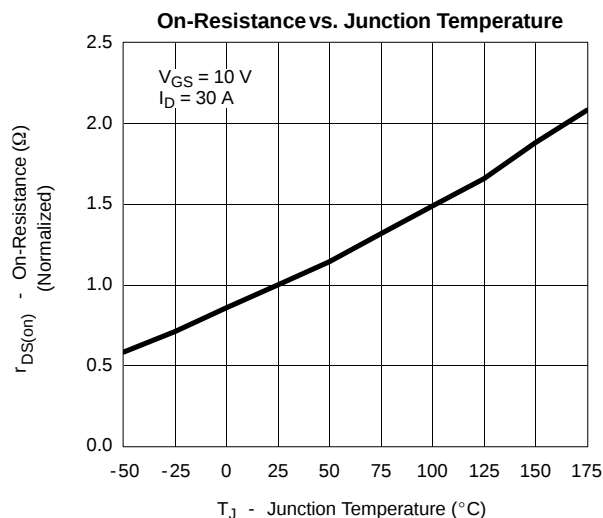
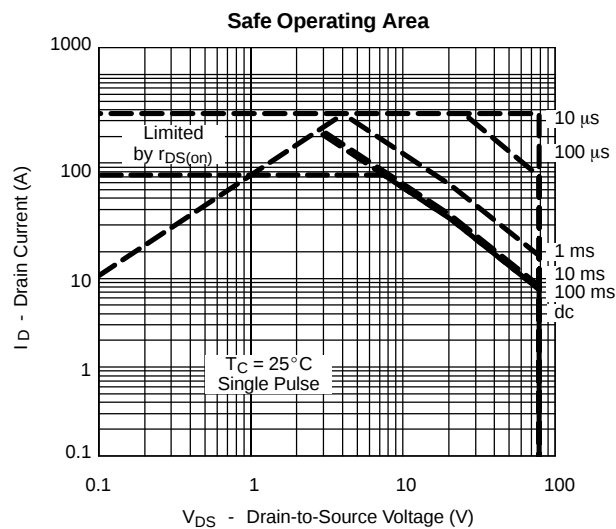
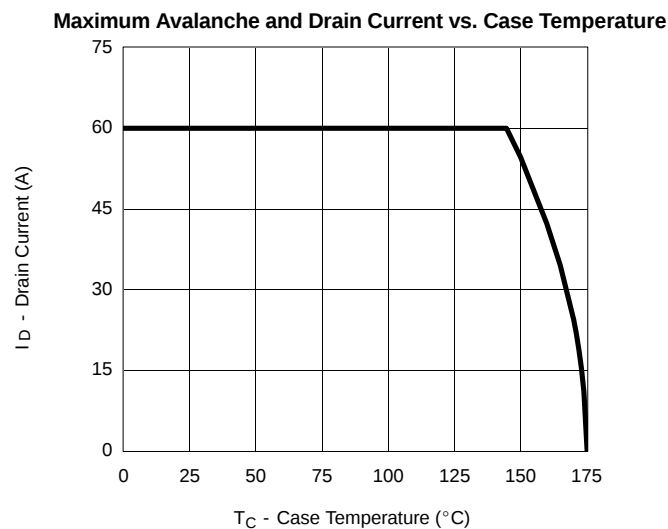
- Package limited.
- Duty cycle $\leq 1\%$.
- See SOA curve for voltage derating.
- When mounted on 1" square PCB (FR-4 material).

MOSFET SPECIFICATIONS (T _J = 25°C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 250 μA	75			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _{DS} = 250 μA	2		4	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60 V, V _{GS} = 0 V			1	μA
		V _{DS} = 60 V, V _{GS} = 0 V, T _J = 125°C			50	
		V _{DS} = 60 V, V _{GS} = 0 V, T _J = 175°C			500	
On-State Drain Current ^a	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	120			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 25 A		0.0054	0.007	Ω
		V _{GS} = 10 V, I _D = 25 A, T _J = 125°C			0.010	
		V _{GS} = 10 V, I _D = 25 A, T _J = 175°C			0.013	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 20 A		100		S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		6500		pF
Output Capacitance	C _{oss}			920		
Reversen Transfer Capacitance	C _{rss}			400		
Total Gate Charge ^c	Q _g	V _{DS} = 35 V, V _{GS} = 10 V, I _D = 60 A		110	150	nC
Gate-Source Charge ^c	Q _{gs}			30		
Gate-Drain Charge ^c	Q _{gd}			30		
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 35 V, R _L = 0.6 Ω I _D ≈ 60 A, V _{GEN} = 10 V, R _G = 2.5 Ω		15	20	ns
Rise Time ^c	t _r			130	200	
Turn-Off Delay Time ^c	t _{d(off)}			75	115	
Fall Time ^c	t _f			120	180	
Source-Drain Diode Ratings and Characteristics (T _C = 25°C) ^b						
Continuous Current	I _S				60	A
Pulsed Current	I _{SM}				240	
Forward Voltage ^a	V _{SD}	I _F = 60 A, V _{GS} = 0 V		1.0	1.5	V
Reverse Recovery Time	t _{rr}	I _F = 60 A, di/dt = 100 A/μs		75	115	ns
Peak Reverse Recovery Current	I _{RM(REC)}			3.5	5	A
Reverse Recovery Charge	Q _{rr}			0.13	0.29	μC
Current Sense Characteristics						
Current Sensing Ratio	r	I _D = 3.5 A, V _{GSS} = 10 V, R _{SENSE} = 2.0 Ω	2270	2370	2470	
Mirror Active Resistance	r _{m(on)}	V _{GS} = 10 V, I _D = 10 mA		10		Ω

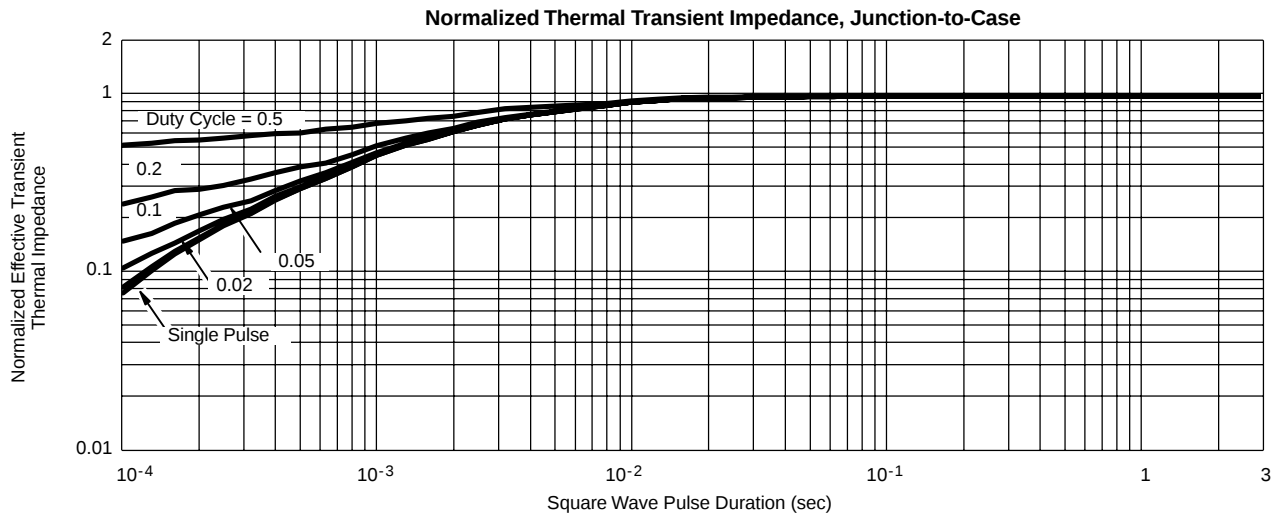
Notes:

- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

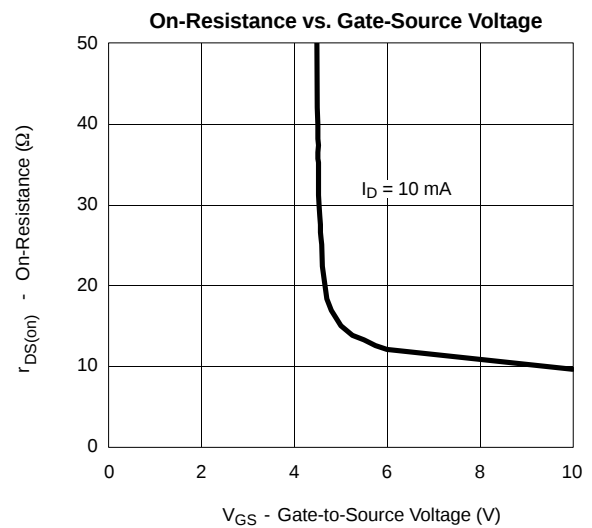
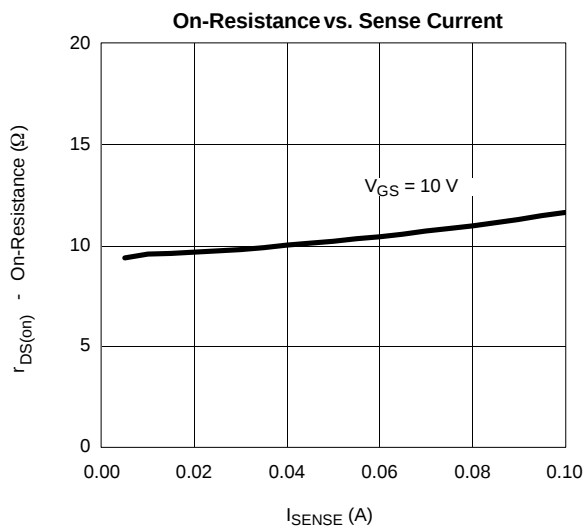
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

THERMAL RATINGS


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TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

SENSE DIE



Current Ratio (I_{MAIN}/I_S) vs. Gate-Source Voltage (Figure 1)

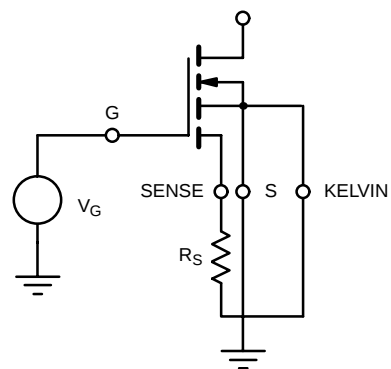
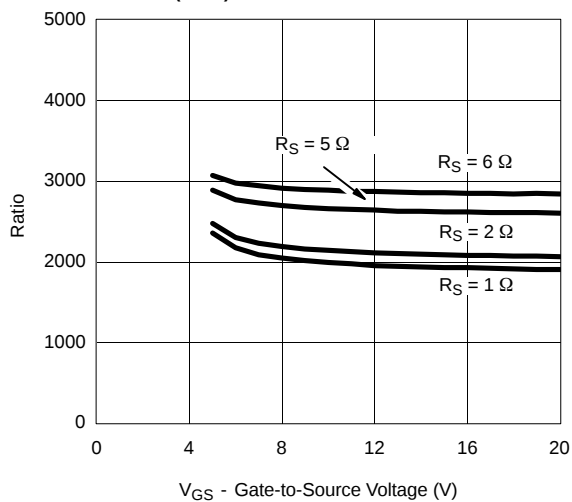


Figure 1